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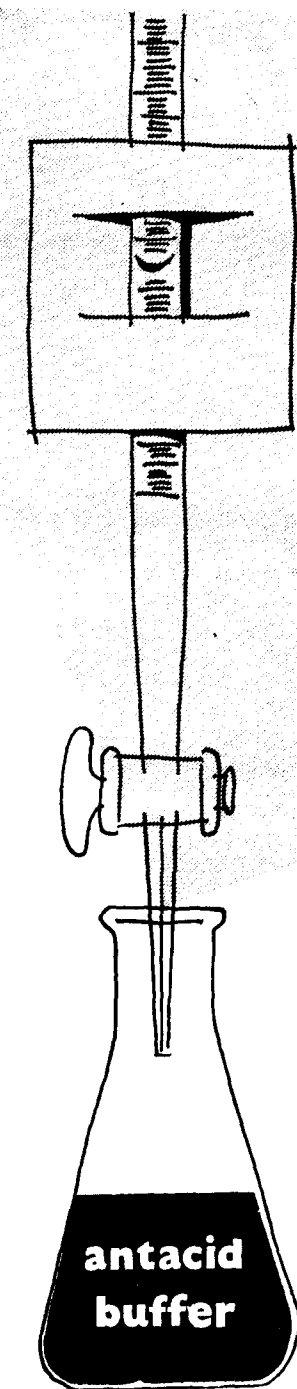
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A MECHANICAL HEART-LUNG FOR USE IN MAN

BY

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With a Foreword by IAN AIRD, Ch.M., F.R.C.S.

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Foreword

Some years ago the department of surgery in the Postgraduate Medical School of London was concerned with research in the perfusion of isolated human organs. The perfusion of isolated organs by blood artificially oxygenated and propelled by a mechanical pump cannot be continued for more than a few hours. After some hours the perfused organ swells visibly and the outflow of blood from it progressively and rapidly diminishes. After a short and not very successful examination of the problem of prolongation of the survival time of isolated organs in these conditions attention was turned to the extracorporeal heart-lung circulation for the maintenance of the circulation of the experimental animal by a total replacement of its own heart and lungs, comparable to that which would be required in the application of an apparatus of this kind to intracardiac surgery. It seemed to us, after some experience in this field, that a machine to undertake the whole function of heart and lungs in a patient subjected to intracardiac surgery was not yet an immediately attainable aim.

Animals maintained entirely on an extracorporeal heart-lung circulation sometimes survive for indefinite periods, but a high proportion fail to survive, perhaps for reasons not dissimilar to those which make prolonged perfusion of the isolated organ impossible. The natural lung may have other functions than oxygenation. In any case, there are immediate practical difficulties in employing a heart-lung machine to replace the heart and lungs of a patient subjected to cardiac surgery. Heparinization must be complete, and the difficulty of obtaining a bloodless field even in a heart to which blood is not returned by the venae cavae has already been demonstrated at least once in man. Our attention accordingly passed to the use of a heart-lung machine as a form of "assisted circulation."

Our aim in this field became the ultimate use of an artificial heart-lung machine for the treatment of certain acute forms of cardiac or pulmonary failure. The value of artificial oxygenation of the blood for even a short period in acute pulmonary oedema or status asthmaticus seemed obvious enough, for, provided the patient can be kept oxygenated for a time, these pathological circumstances are often self-limiting. In coronary thrombosis there are patients in whom it might be expected that the

temporary provision of a high aortic pressure might tide the patient over a fatal low-pressure period, and might improve such coronary circulation as was still open. In congestive heart failure, when failure has been due to a relatively small fall in a previously low cardiac output, to withdraw blood from the congested veins and to perfuse it oxygenated into an arterial tree would seem to combine the advantages of venesection and adequate oxygenation. The mechanism would have a particular advantage in preparing grossly cyanotic sufferers from mitral stenosis for a valvulotomy which they could not otherwise sustain. Dr. Melrose proceeded to devise an apparatus which might ultimately be applied to these and similar purposes and to test that apparatus in the form of an assisted circulation in parallel with the natural circulation of an experimental animal. The results of his whole-time activity in this field over a period of four years are recorded in the two papers which follow. His data indicate that his machine might now be justifiably and humanely applied to certain varieties of anoxia and circulatory failure in man.

Artificial Maintenance of Life

The possibility of maintaining life artificially in animals or parts of animals has excited the interest of many over the last century. Numerous attempts have been made to create an apparatus capable of this, but until the last decade these efforts have been sporadic and isolated in character. The publication by J. H. Gibbon, jun., in 1937 of a paper on artificial maintenance of the circulation during experimental occlusion of the pulmonary artery heralded the beginning of a new approach to the problem. His object was to short-circuit the heart and lungs of animals to allow intracardiac surgery in a bloodless field. Coinciding as it did with the emergence of a new era in surgery—that of replacement rather than ablation—his work stimulated a great new interest and challenge which was taken up in many surgical centres. This challenging problem was, and still remains, to produce an extracorporeal apparatus capable of maintaining temporarily the entire circulation of the human body.

Contributions in this field from Crafoord and Björk in Sweden, Kolff and Jongbloed in Holland, André Thomas in France, Dennis and Leland Clark in America, and many others have resulted in continuous progress, and now the stage is almost set for clinical use.

*Part of the work was done under the tenure of a Studentship in Research from the Medical Research Council.

Stimulated by these advances, it was decided in 1949 that a machine should be constructed to serve three purposes. First, to carry temporarily a part of the cardio-respiratory function when the function of either or both of these organs is impaired; secondly, to provide a complete diversion of the blood stream away from the chambers of the heart in order to permit intracardiac surgery; and, thirdly, to perfuse isolated organs.

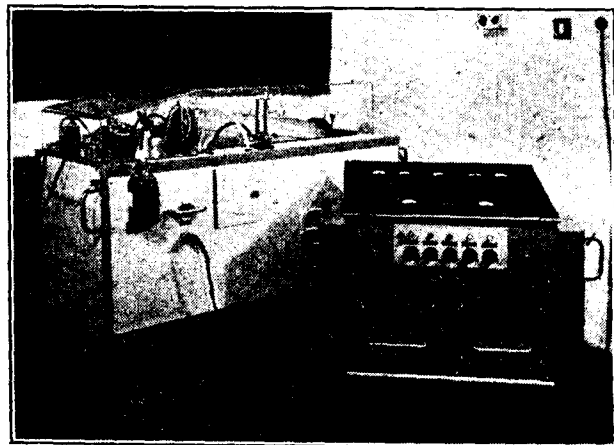


FIG. 1.—The pump-oxygenator with controlling apparatus.

The Pump-oxygenator

Initially, considerable experience was gained with a pump-oxygenator essentially similar to that described by Björk (1948a) and Crafoord (1949). In this machine a number of disks dip into a trough of blood; when rotated they pick up on their surfaces thin films of blood, exposing them to an atmosphere of oxygen, and in this way create a large gas-liquid interface. After this method had been investigated and compared with other methods, particularly those involving the dispersal of oxygen as minute bubbles, it was decided to embody the principle of rotating disks in a machine of novel design capable of circulating adequately oxygenated blood at a rate of at least 3 litres a minute (Fig. 1).

Two factors are important in the utilization of this principle. The first is that the optimum period for which each red blood cell should be exposed to oxygen is in the region of half a second. The second factor is that the exposure time must be achieved without increasing above a definite maximum the speed of rotation of the disks. Rotational speeds in excess of 80 r.p.m., corresponding to a velocity at the periphery of the disks of 52 cm. a second, frequently lead to foaming of the blood.

These two factors are of major importance, since they limit the effective area for oxygenation of each plate, but there are others which also affect the efficiency of such machines. These are: (1) The area of interface between blood and gas should not vary with changes in the volume of blood in the machine. (2) Mixing of blood should be very complete, for no provision can be made to replace completely each saturated film, after exposure to oxygen, with one as yet unsaturated. (3) The measures to ensure mixing should not impede smooth and rapid flow through the machine. (4) Foaming if it occurs should not greatly interfere with the efficient operation of the artificial lung. (5) The

apparatus should be capable of being completely dismantled for effective cleaning. (6) Adequate surface area should be obtained without the use of a very large volume of blood to charge the machine. (7) For ease in maintaining sterility, a system as nearly closed as possible is desirable.

From these considerations it is seen that enlarging the diameter of the disks makes a longer exposure of time inevitable if a safe rotational speed is to be maintained, while increasing the number of disks greatly increases the blood volume required for charging. Neither of these measures, nor a combination of them, confers any improvement in the mixing, or in ensuring the maintenance of an optimum blood film size.

The Oxygenator

The new oxygenator (Fig. 2) is essentially a rotating cylinder set at a slight angle to the horizontal. Within it blood travels under the influence of gravity from one end to the other, and is spread over a multitude of surfaces formed by blades projecting into the lumen of the cylinder. These blades are arranged within the cylinder somewhat in the form of an Archimedean helix. This analogy is not strictly accurate, but may clarify the method of construction, which is in fact carried out in the following manner. A cylinder of "perspex" 30 in. (76 cm.) in length and of internal diameter of 8 in. (20.3 cm.) is free to rotate in its long axis while supported on rollers at 20 degrees to the horizontal. It is closed at each end by an end-plate of "tufnol" 10 in. (25.4 cm.) in diameter. In this cylinder

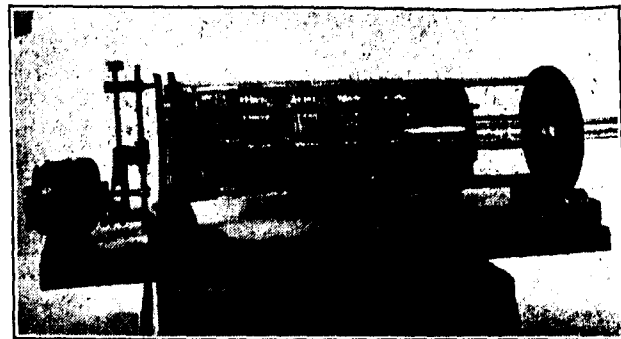


FIG. 2.—The oxygenator.

annular plates of 1/24 in. (1 mm.) perspex, with an overall diameter of 7 1/4 in. (20 cm.) and an internal diameter of 4 1/4 in. (11 cm.), are separated one from the other by annular washers. These washers have the same external diameter as the plates but an internal diameter of 5 1/4 in. (13.6 cm.).

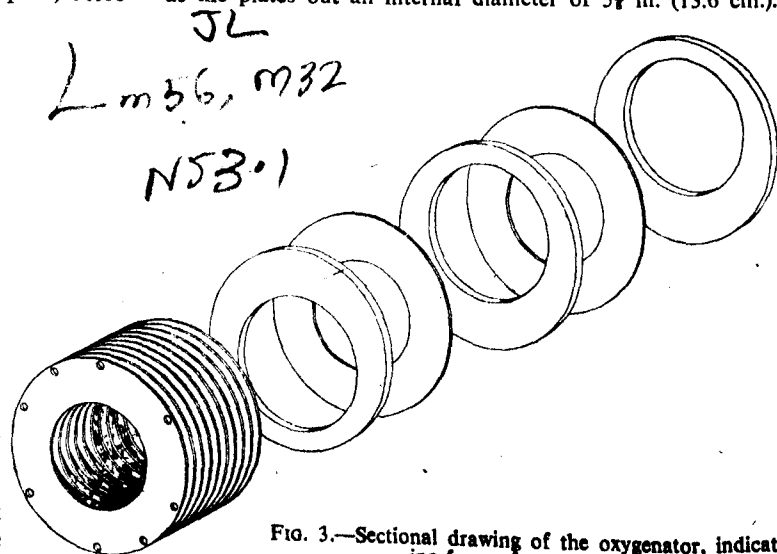


FIG. 3.—Sectional drawing of the oxygenator, indicating form of construction.

They are constructed from perspex 5/16 in. (0.8 cm.) thick. The holes in the plates are concentric, but the holes in the washers are cut eccentrically, the centres of the hole being 1 in. (2.54 cm.) from the true centre of the washers.

These plates and washers are mounted in the cylinder on chromium-plated rods and are freely detachable for cleaning. A maximum of 76 plates and their separating washers may be used to provide a surface area of approximately 1 square metre.

The plates (Fig. 3) are fitted so that their central holes form a cylindrical cavity, coaxial with the enclosing cylinder.

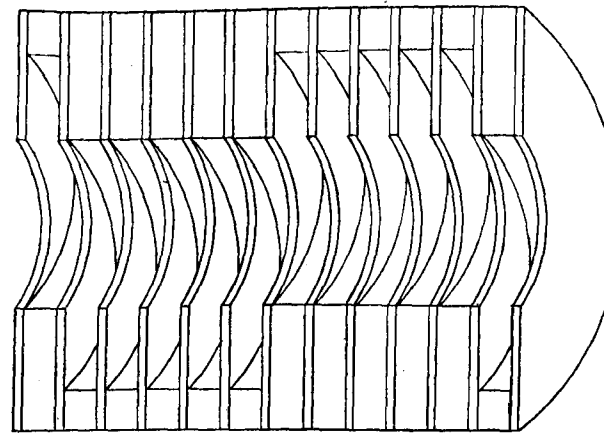


FIG. 4.—A portion of the oxygenator in sagittal section.

der, but the arrangement of the washers between each plate varies with each group of five. Each group of five washers are mounted so that the holes in them form a cylinder eccentric to the cylinder formed by the holes in the plates, and, as the internal diameter of the washers is larger by 1 in. (2.54 cm.) than that of the plates, these plates project as crescents within the cavity formed by the holes in the washers. Each group of five washers and plates is arranged relative to the next group so that crescentic protrusions of the plates are at opposite poles. In sagittal section, therefore, the cylinder presents a series of alternating platforms and troughs, these troughs being subdivided into five compartments by the five plates (Fig. 4).

Passage of the Blood

In describing the path of the blood passing by gravity along the tilted oxygenator, it is helpful to consider first the hypothetical case in which both washers and plates are fitted so that the holes in them are concentric. A pool of blood would lie along the base of the cylinder formed by the holes in the washers to the depth of the level of the holes in the plates. Rotation of the oxygenator would not affect the position of the pool in space. Where the holes in the washers are eccentric to the holes in the plates and the circumferences of these holes touch at one point in any group of five, a different action is apparent. When the point of touching is at top centre a pool of blood will be formed as in the previous case. During any revolution, as the point of touching approaches bottom centre this pool will be emptied by the action of the washers, which in effect rise to the level of the holes in the plates. The alternation of phase between adjacent groups ensures that as a pool in one group empties so it is re-created in the next group.

Further, during any revolution the crescentic projections of the plates are alternately fully covered by the pool of blood, and also, together with adherent films of blood, fully exposed to the gas contained in the oxygenator.

The stream of blood passing down the oxygenator is alternately raised and lowered by the action of the washers. This action avoids the necessity of the edges of the plates cutting across the streamline in order that they may become

covered with blood. In fact, blood is poured over the plates and into the pool formed between them, then raised up and carried down the oxygenator before being poured over the succeeding group of plates.

This arrangement permits a thorough mixing of the blood with a smooth and rapid passage along the machine. It also ensures that all the available surface area is utilized without reference to the volume of blood contained in the machine. Furthermore, it enables the machine to work with a relatively small charge of blood.

The cylinder is rotated by a friction wheel, driven by an electric motor. Adjustment of the position of the driving wheel in relation to the diameter of the end-plate allows cylinder speeds between 24 and 120 revolutions a minute to be obtained. At maximum speed the surface area exposed per minute is in the region of 120 square metres, though it is preferable to use only as great a rotational speed as is necessary to obtain efficient oxygenation.

The inlet and outlet tubes for the blood, together with the inlet for oxygen and a fourth tube used to estimate the level of the blood in the collecting chamber, enter at one end. These tubes are carried by a perspex rod which passes through a simple felt seal in one end-plate down the centre line of the oxygenator to a chromium-plated bearing on the other end-plate. No attempt has been made to make a gas-tight seal, though this is undoubtedly possible.

Experience has shown that the distance between the plates can be reduced from 5/16 to 3/16 in. (0.8 to 0.48 cm.) without increasing the danger of foaming. It is expected that a moulding in nylon or teflon (polytetrafluorethylene) will be produced combining both washer and plate, and this will enable the number of parts to be halved. It will also enable autoclaving to be used for sterilization. This latter point is undoubtedly of great importance, and might be considered essential in a machine for use in human beings. Further, during the moulding process a large number of corrugations can be pressed into the surface of the plates and the surface area of each greatly increased.

The Pumping Circuit

Since the oxygenator is not part of a closed circuit, it is essential that two pumps be used; one to act as the right side of the heart to supply the artificial lung and the other as the left side of the heart to return oxygenated blood to the recipient.

The pumping circuit must not only be capable of circulating blood at physiological rates and pressures without destroying its constituents, but must also be capable of exact regulation. For this purpose the most satisfactory pump is a rotary type without valves in which an elastic tube, through which the blood passes, is squeezed within the pump by the action of a roller. The decision to employ this type of pump was made after comparison with many forms of the Dale-Schuster pump. It has obvious advantages over the latter in simplicity and ease of sterilization, but had a disadvantage in that the action of the roller in squeezing the tube sometimes caused greater haemolysis. Investigation revealed that this was largely due to the scrubbing of one wall of the tube on the other, an effect produced by the severe shearing forces set up by the roller in squeezing the tube. Re-design of the pump tested, a model based on the design of Henry and Jouvet, resulted in a considerable reduction of this effect, which in turn reduced the rate of haemolysis by as much as 70% in some comparisons.

The pump (Figs. 5, 6, 7, and 8) now used consists of a circular housing in which there is clamped a loop of tube. Within this loop is a large single roller free to rotate on ball-bearings which are mounted on a compound driving shaft. This shaft is made up in the following way. A central driving spindle has fixed to it a cam, the centre of which is 1/4 in. (0.6 cm.) from the true centre. On this cam is carried an outer cam the centre of which is also 1/4 in.

from the true centre. This outer cam is free to rotate about the inner one, but may be locked in any position. Adjustment of the outer cam on the inner one provides any degree of throw from 0 to $\frac{1}{4}$ in. (1.3 cm.). In operation the outer cam is adjusted so that the roller carried on the shaft just closes the lumen of the tube in the pump. Then rotation of the driving spindle carries the roller around the

arterial pump is working, and one measures the pressure at which the venous pump is working. The signals from the three manometers are used to form a pattern of servo-loops which result in automatic adjustment of the pumping speed.

The most important function of the control is to ensure that the volume of blood in the machine is constant within narrow limits under varying conditions. As no two pumps of the type employed can be relied upon to deliver constantly matched outputs, it is essential that the rates should be controlled from the blood volume within the artificial circulation, as this will give a true indication of any imbalance between the two. For this reason the signal from the volume indicator manometer is used to induce the two pumps to work at such speeds that they will deliver the same blood flow.

The signal derived from the arterial pressure manometer can be used either to adjust automatically the rate of circulation to such a value that it maintains the blood pressure at a fixed level or as a limiting device to slow down or stop the circulation in the event of the pressure rising above a limit. Since the rate of circulation ultimately depends on the venous return available and as any excessive suction from the venous pump merely collapses the veins, it is clear that the suction pressure must play an important part in the controlling system. The signal from the venous suction manometer performs the same function in the control of the venous pump as the arterial pressure signal does for the arterial pump—that is, it tends to reduce the speed of pumping as the suction pressure rises, and will bring the circulation to a stop when a limit is reached. Hence a compromise is established

—the two pumps working to maintain the blood volume and the arterial pressure, and to prevent the venous suction becoming too great.

This control gear, with its indicating instruments, warning lights, and switches, is housed in a separate trolley. On the control panel of this trolley are arranged the manual and automatic speed-control selectors with meters indicating the rate and pressure at which each pump is working. Another meter indicates the volume of fluid in the oxygenator. Warning lights are placed above the pressure gauges and the fluid volume meter to draw attention to any variations that exceed chosen limits.

Working of the Pump-oxygenator

On the main trolley the pumps and oxygenator are arranged so that easy access to them is possible. The oxygenator lies on rollers in a recess in the top of the trolley and is covered by a transparent hood. Within this recess a constant temperature can be maintained by warm air, heated by infra-red lamps and circulated by a fan under thermostatic control. Oxygen and carbon dioxide are delivered to the oxygenator through rotameters which allow adjustments of flow rate to maintain the appropriate carbon dioxide tension. The gases pass through a warming, filtering, and humidifying system and then traverse the oxygenator in the opposite direction to that of the blood. A device

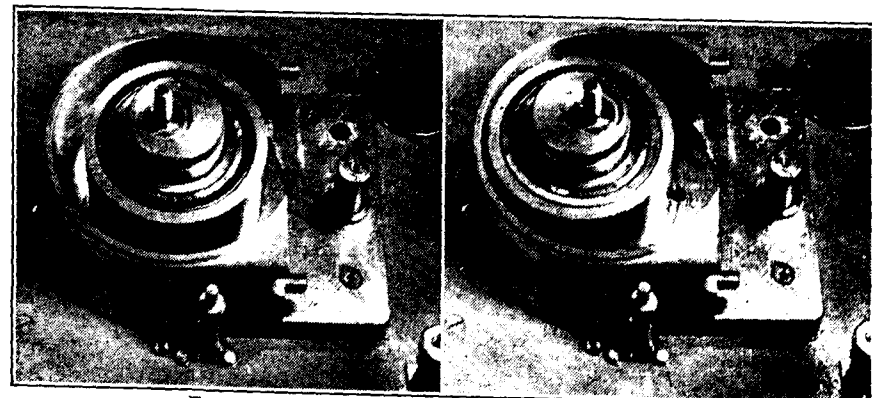


FIG. 5

FIG. 6

FIG. 5.—One of the pumps unassembled, with the roller in a concentric position within the circular housing. FIG. 6.—The roller moved to a fully eccentric position.

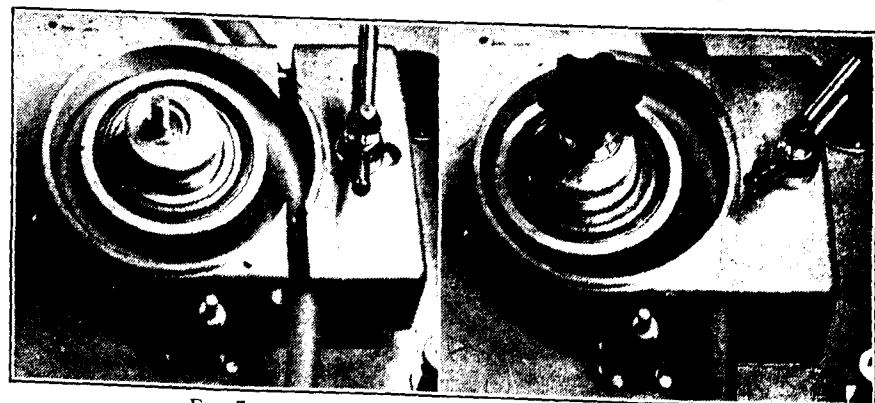


FIG. 7

FIG. 8

FIG. 7.—A loop of tubing in position between the pump housing and the roller, which is in the concentric position. FIG. 8.—The pump fully assembled. The tube is clamped within the pump housing and is compressed by the roller, which has been adjusted to a degree of eccentricity sufficient to close the lumen of the tube.

inner wall of the pump housing, causing it to squeeze the tube in such a manner that a pumping action is obtained. Adjustment is simple and rapid, no blood comes into direct contact with any moving parts, and a pulsatile flow is obtained.

Control Mechanism

The stroke volume depends only on the bore of the tube, and in the pump used this may be varied from $\frac{1}{4}$ to $\frac{1}{2}$ in. (0.3 to 1.3 cm.). Both pumps are driven by fractional horsepower D.C. shunt wound motors through reduction gearing and belt drive. These motors are of special type and are so designed that their speed may be controlled over a 10:1 range by magnetic amplifiers (English Electric $\frac{1}{2}$ h.p. "magamp"). These amplifiers have no thermionic valves in them and are almost mechanical in operation, gaining thereby in reliability and stability. They can be controlled by hand, and such adjustment will enable the circulation to be operated under direct control. However, a rather more sensitive control is achieved by an electronic apparatus designed to replace the delicate balancing mechanism of the animal. This control gear takes as its guide three quantities measured continuously by electrical manometers. These are of the differential-transformer type and are particularly stable. One measures the volume of blood in the artificial circuit from the depth of blood in the collecting chamber of the oxygenator, one measures the pressure at which the

for automatically controlling the gas mixture from the pH of the blood in the machine is under construction, but is not at present fitted to the machine.

All the tubes enter and leave the oxygenator at one end of the trolley in close proximity to the two pumps (Fig. 9). Connecting blocks at this end of the trolley facilitate the various junctions in the tubing. The arterial block acts both as a coarse filter and as a bubble trap from which bubbles may be returned to the oxygenator through a by-pass tube, which passes through a clamp controlled by a solenoid operated from the control panel. This clamp also acts as a relief valve in the event of a sudden blockage in the arterial line. Connexion to the arterial manometer is also made from the arterial connecting-block.

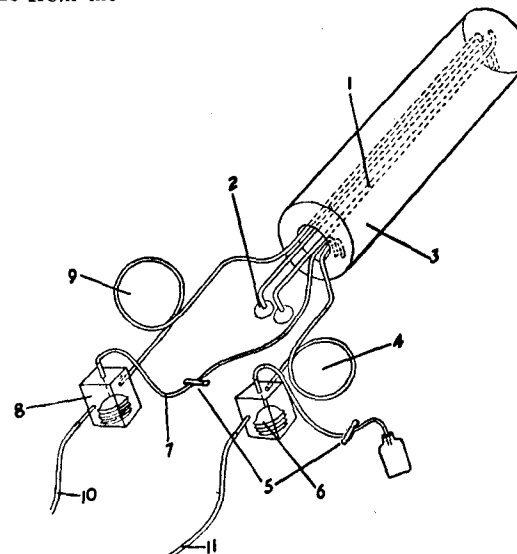


FIG. 9.—The general arrangement of the oxygenator, pumps, manometers, and tubing connections. 1, Gas entry. 2, Oxygenator level manometer. 3, Oxygenator. 4, Venous pump. 5, Solenoid clamps. 6, Venous manometer. 7, By-pass tube. 8, Arterial filter block and manometer. 9, Arterial pump. 10, "Artery." 11, "Vein."

From the venous connecting-block a tube goes to a reservoir from which the machine is charged and from which transfusions may be made. The tube passes through another electrically operated clamp controlled from the control panel. A second tube connects the venous line to the venous suction manometer.

The tubing in the circuit is of "portex" P.V.C. (polyvinyl-chloride), and is used but once. Before use it is treated with Dow Corning "dimethyl-dichlorosilane" to ensure that the surface is completely non-water-wettable. The arterial catheters are fashioned from this tubing, which is softened by immersion in boiling glycerin and drawn out into a convenient taper, after which rapid cooling fixes the tube in this shape. It can then be hardened by immersion in ethyl ether for 24 hours.

"Polythene" or portex is equally suitable for the venous catheter. Numerous side holes punched in this tube provide efficient collection of blood from the thin-walled veins by gentle suction.

Results of Tests

The machine is efficient, reliable, and comparatively easy to operate. *In vitro* tests confirm that it adequately fulfils the design criteria.

The volume of blood required to charge the machine has been varied between a minimum of 0.5 litre and a maximum of 2 litres without affecting the efficiency of operation.

When stored blood was used it was possible to introduce approximately 100 volumes of oxygen into each litre of blood flowing through it. At 2 litres a minute an average figure is 205 c.cm. of oxygen uptake into stored blood. With

fresh blood circulating at 900 ml. a minute, the difference in oxygen saturation between blood entering and leaving the oxygenator was 174 volumes per litre, indicating an uptake of 156 c.cm. of oxygen a minute. At this time the oxygenator was rotating at 60 revolutions a minute.

The average amount of haemolysis in 500 ml. of stored blood circulated for two hours at rates of up to 2 litres a minute was 0.1 g. Hb per 100 ml. When fresh blood was circulated at a rate of approximately 1 litre a minute the haemolysis was rarely detectable to the naked eye and did not exceed 0.05 g. Hb per 100 ml. an hour.

Foaming is not a serious problem, though it will occur if many air bubbles are carried into the oxygenator in the ingoing blood. This foam does not affect the rate of oxygenation, but may increase the rate of haemolysis. It can be prevented by ensuring that the tubes on the suction side are air-tight. If a film of Dow Corning "antifoam A" is deposited over the interior of the machine no foaming occurs whatsoever in spite of injecting foam into the oxygenator.

The servo mechanism controlling the operation of the pump will maintain the blood volume within 50 ml. over a speed range between 300 ml. and 3 litres a minute. It will adjust the pumping rate in response to the pressure manometers, and when one pump is suddenly stopped will bring the other to a standstill within a volume change of 150 ml. The electronic mechanism possesses remarkable stability, and during trials extending over several days, when the apparatus was called upon to repeat frequently, without adjustment, an elaborate series of tests, it proved faultless. The method of construction allows various forms of servo control to be employed by altering the interconnections between the various units.

Cleaning is effectively carried out after dismantling the apparatus, including all the washers and plates within the oxygenator. It has been found more economic to replace the tubing after each perfusion, though this is not absolutely necessary. As the entire surface with which the blood is in contact is of inert plastic material and the "intima" non-water-wettable, very little deposition of fibrin and other proteins occurs. This property also reduces the amount of anticoagulant required to maintain the fluidity of the blood. At present the oxygenator must be sterilized with chemical agents, for perspex deforms at 100° C. However, this material is being replaced by nylon or teflon, when it will be possible to autoclave in one unit everything in contact with blood.

An extensive series of animal experiments has amply confirmed that the performance under these conditions is in no wise different from that *in vitro*, and justifies the further development of this prototype heart-lung machine.

I am indebted to Professor C. Crafoord and Dr. V. O. Björk for their kindness during my visit to Stockholm in 1949, when I greatly benefited from their experiences in this field. Also I wish to acknowledge the important contributions of the many who have helped in the design and construction of this machine, particularly Mr. R. L. G. Rainbow, Mr. C. Lordon, and Mr. J. Neal, of the Postgraduate Medical School, Mr. Schranz, of the Genito-Urinary Co., Ltd., and Mr. Kellerman and Mr. Brown, of New Electronic Products Ltd. The design of the control gear was carried out by Mr. Brown, who will describe the mechanism in detail elsewhere. Patent applications have been filed and assigned to the National Research Development Corporation.

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EXPERIMENTAL PHYSIOLOGY OF A HEART-LUNG MACHINE IN PARALLEL WITH NORMAL CIRCULATION*

BY

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Recognizing the magnitude of the task involved in the mechanical maintenance of the entire circulation in humans, we turned our attention to the lesser problem of assisting the natural circulation by shunting part of it from vein to artery through the heart-lung machine. To assess the value of the heart-lung machine in resuscitation and in the treatment of a failing circulation, and to acquire information to be applied later to the problem of complete artificial maintenance of the circulation in man, a series of experiments was carried out in dogs.

In the planning and execution of these experiments we were helped by experience gained from a large number of studies carried out with earlier machines. These studies included the perfusion of isolated organs, which proved particularly valuable in providing the basis of the present technique, and enabled controlled conditions to be established.

The Experiments

Thirty greyhound dogs, each weighing between 20 and 30 kg. and apparently healthy, were used. They were dewormed and given intramuscular penicillin (300,000 units 8-hourly) for two days prior to the day of an experiment, when each dog was anaesthetized with intra-

peritoneal pentobarbitone sodium (30 mg. per kg. body weight). A cuffed tube was introduced into the trachea and inflated, and was then connected to a Benedict-Roth spirometer containing oxygen. Electrocardiograph leads were fixed to the two fore-limbs and to the right hind-limb.

A small incision was made in the neck, and an external jugular vein and a carotid artery were exposed. A radio-opaque catheter was then introduced into each of these vessels and was guided under fluoroscopic control into the right auricle and the ascending aorta or left ventricle respectively. The catheters were connected to continuously recording manometers and arranged so that blood samples could be obtained from them. The patency of each was maintained by flushing with saline which contained heparin (2 mg. per 100 ml.).

One or other deep femoral artery was exposed together with one of the major branches of a femoral vein. A tapered plastic catheter was then introduced into the deep femoral artery and connected to the "arterial" tube of the heart-lung machine. A plastic catheter 25 cm. in length, with numerous side openings, was passed into the femoral vein and advanced until its tip was judged to rest within the thoracic portion of the inferior vena cava. Connexion was made between this catheter and the "venous" tube of the heart-lung machine.

Concurrently with the preparation of the animal the machine was being assembled and made ready for perfusion (see Appendix I). In the first five experiments it was charged with approximately 750 ml. of donor dog's blood, but subsequently, because facilities for sterile blood collection proved inadequate and no definitive method could be achieved for cross-matching mongrel and greyhound blood, a solution of 6% dextran in normal saline was used.

The animals were now given heparin or dextran sulphate (Walton, 1951), 1-2 mg. per kg. being used. Primary readings were then made of the arterial and central venous pressures, the oxygen consumption, and the electrocardiograph, which were then recorded con-

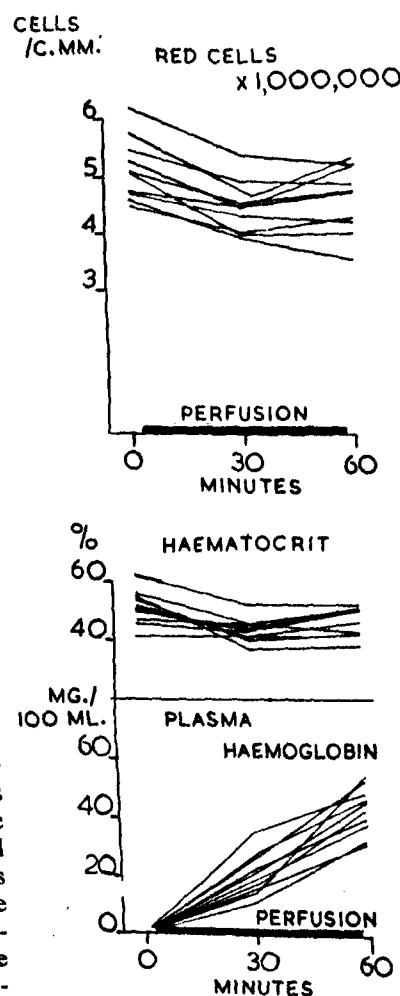


FIG. 1.—Red-cell count, haematocrit, and plasma haemoglobin in 10 dogs before, during, and immediately after one hour's

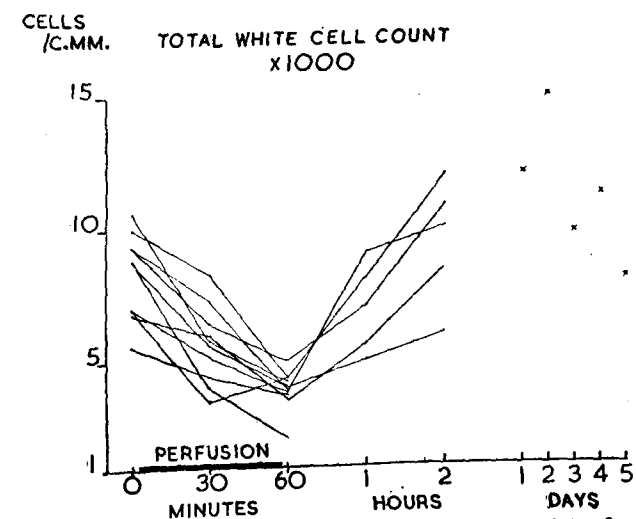


FIG. 2.—White-cell count in 10 dogs before, during, and for five days after one hour's perfusion.

tinuously. Arterial and venous blood samples were also obtained. On these samples were made the following determinations, using standard techniques (Appendix II): (1) arterial and venous blood oxygen content; (2) counts of red cells, platelets, and leucocytes, including the differential and Arneith counts; (3) haematocrit and plasma haemoglobin; (4) plasma sodium, potassium, and chloride, sugar, urea, and carbon-dioxide combining power; and (5) pH.

The heart-lung machine was now started and adjusted to circulate at 50-100 ml. a minute, and then increased in rate gradually to between 750 and 1,000 ml. a minute. In most experiments the perfusion was continued for a standard time of one hour, blood samples being taken at intervals during this time and again ten minutes after it had ended.

RATIO OF GROUP I GRANULOCYTES TO GROUP IV GRANULOCYTES

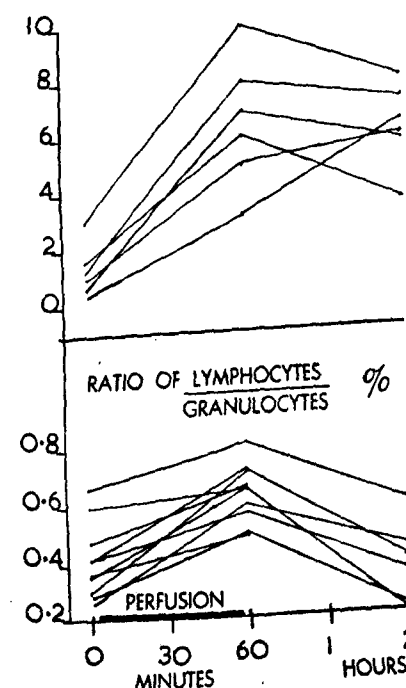


FIG. 3.—Ratio of Group I to Group IV granulocytes in six dogs and the ratio of lymphocytes to granulocytes in 10 dogs before, during, and for two hours after perfusion.

When the final measurements had been made the cannulae were removed, the carotid artery and external jugular vein ligated, and the femoral artery and the vein repaired or ligated. Protamine sulphate was given to neutralize the heparin effect and the dog was allowed to recover consciousness. Subcutaneous vein blood samples were subsequently taken hourly for two hours and then daily for five days, and on these samples a full leucocyte count was carried out.

Effect of the Machine on the Blood

The most notable effect of the machine on blood circulating through it was on the cellular elements. After one hour's perfusion in 10 dogs the average red-cell count fell from 5,150,000 to 4,500,000 per c.mm., the average haematocrit fell from 51 to 46%, and the average plasma haemoglobin concentration rose to 43 mg. per 100 ml. (Fig. 1).

A dramatic fall occurred in the number of circulating white

The results of the experiments are considered under four headings: (1) clinical assessment of the effect of the procedure and analysis of morbidity and mortality; (2) the changes in the blood itself while circulating through the machine; (3) the general circulatory effects produced by the artificial circulation; and (4) evidence of the efficiency of the machine as an extrapulmonary oxygenator.

Clinical Assessment of the Procedure

No death directly attributable to the extracorporeal circulation occurred in the 30 dogs studied. Four dogs did not survive the procedure. Two died on the operating table as a result of misjudgments, one from an uncontrollable haemorrhage, and another from a period of asphyxia purposely induced to initiate anoxic collapse of the circulation. One died after prolonged hypotension which began immediately after the perfusion had started and which was probably the effect of donor blood, and one died of peritonitis following intraperitoneal pentobarbitone sodium anaesthesia.

Assessment of recovery from the procedure was complicated by the fact that in 18 cases the femoral artery was ligated and the leg in question temporarily immobilized.

CELLS /C.MM. PLATELETS x100,000

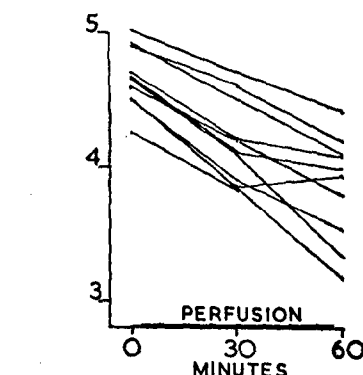


FIG. 4.—Platelet count in 10 dogs before, during, and immediately after perfusion.

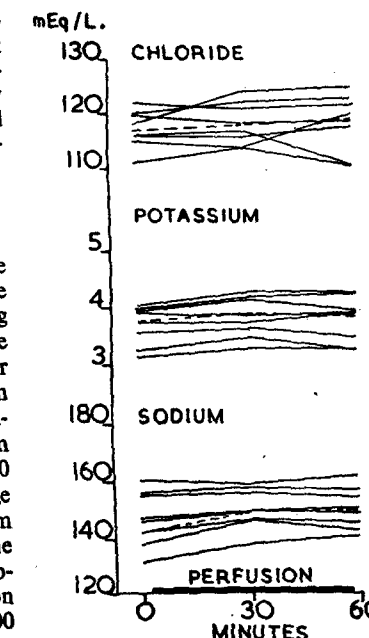


FIG. 5.—Plasma chloride, plasma potassium, and plasma sodium in 10 dogs, before, during, and immediately after perfusion.

*This work was carried out at the Buckston Browne Research Farm, Kent, by permission of the President and Council of the Royal College of Surgeons of England.

cells during the same time (Fig. 2)—from an average primary value of 8,200 per c.mm. to an average value of 4,800. The greatest fall recorded was from 8,800 to 2,100 per c.mm. One hour after cessation of perfusion the average value had risen again to 6,000, and one hour later it had become 8,800 per c.mm. A leucocytosis persisted for five days in all animals.

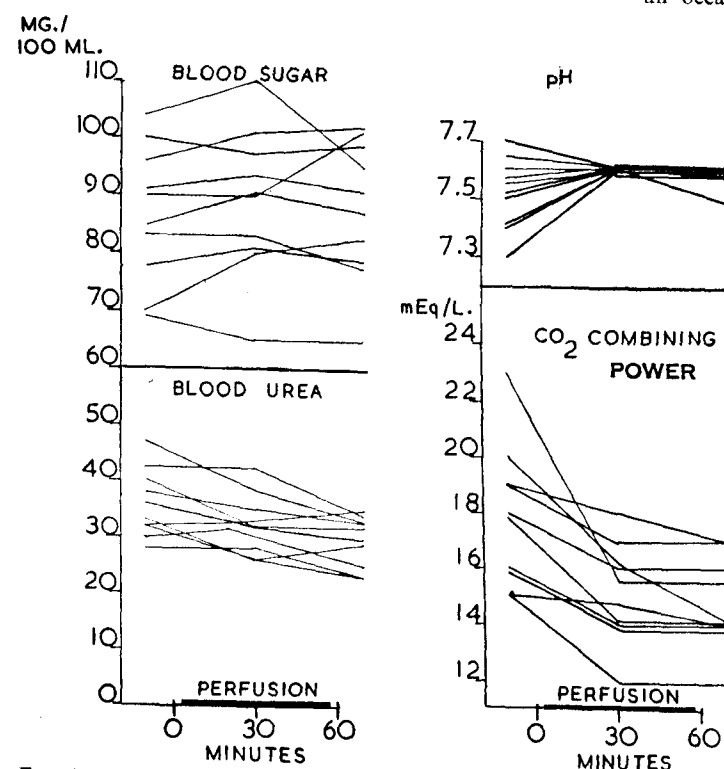


Fig. 6.—Blood sugar, blood urea, pH, and plasma carbon-dioxide combining power in 10 dogs before, during, and immediately after perfusion.

The differential count, expressed as the ratio of lymphocytes to granulocytes, and the Arneth count, expressed as the ratio of Group I granulocytes to those of Group IV granulocytes (Fig. 3), showed, after 60 minutes' perfusion, a rise in the average lymphocyte:granulocyte ratio from 0.39 to 0.6, and a marked rise from 1.3 to 7.8 in the average ratio of Group I granulocytes to Group IV granulocytes. This indicated that the fall in white cells particularly affected the granulocytes, and that the more elderly are more greatly affected than the less-developed ones. Two hours after perfusion the ratio of lymphocytes to granulocytes had fallen again to 0.36, but the ratio of Group I to Group IV granulocytes had remained elevated at 6.2.

The platelet count fell from an average value of 463,000 per c.mm. in one hour to an average value of 378,000 (Fig. 4).

In contrast to the cellular elements the plasma electrolytes were relatively unaffected. After one hour's perfusion the average plasma sodium had increased from 149 to 156 mEq per litre, the average plasma chloride from 116 to 120 mEq per litre, and the average plasma potassium from 3.6 to 4.0 mEq per litre (Fig. 5). During the same time the average plasma carbon-dioxide combining power had fallen from 18.0 to 16.0 mEq per litre, while the pH had risen from an average of 7.5 to an average of 7.6 (Fig. 6). No significant change was recorded in the measurements of blood sugar and blood urea, the former falling from an average value of 86 to 82 mg. per 100 ml. and the latter falling from an average value of 36 to 30 mg. per 100 ml. (Fig. 6).

Determinations of the plasma proteins were invalidated by the use of dextran.

Effect of the Machine on the Circulation

In the first five experiments, when donor blood was used, the initial delivery from the machine produced a fall in arterial blood pressure which persisted throughout the per-

fusion. In the remainder, when a solution of dextran in sodium chloride was used, the introduction, maintenance, and termination of the perfusion was accomplished without untoward events, the blood pressure, pulse, and respiratory rates remaining virtually constant.

Electrocardiograph tracings revealed no changes other than an occasional alteration in cardiac rate. No arrhythmias were induced even when the perfusion was started or stopped suddenly.

The cardiac-output changes deduced by application of the Fick principle to the measurements of oxygen consumption and arteriovenous oxygen differences are well exemplified in the detailed consideration of Dog No. 20. This dog remained evenly narcotized throughout two and a half hours. Respiration was deep and regular, and before the beginning of the perfusion the oxygen consumption was 140 c.cm. a minute, the cardiac output 3.2 litres a minute, the mean arterial pressure 115 mm. Hg, and the central venous pressure +2 cm. H₂O. Three minutes after perfusion at 750 ml. a minute the oxygen consumption had fallen to 115 c.cm. a minute and the central venous pressure had fallen to -1 cm. H₂O. The mean arterial pressure had not altered. After 30 minutes the oxygen consumption had fallen to 85 c.cm. a minute and the cardiac output to 2 litres a minute. The mean arterial pressure was then 118 mm. Hg and the central venous pressure +1 cm. H₂O. Just after perfusion stopped the oxygen consumption rose to 160 c.cm. a minute for four minutes and then fell to 95 c.cm. a minute during the succeeding five minutes. At this time the cardiac output was 2.3 litres a minute, the mean arterial pressure 115 mm. Hg, and the central venous pressure +2 cm. H₂O.

Similar determinations of cardiac output were carried out in 12 dogs (Fig. 7). In nine the cardiac output fell during perfusion, in one it remained unaltered, and in two it rose. In seven of the nine dogs in which the cardiac output fell the extent of the fall approximated the rate of perfusion, averaging 850 ml. a minute.

Evidence of Efficiency of the Machine as an Extrapulmonary Oxygenator

Oxygen can undoubtedly be introduced into a recipient's blood stream by means of the heart-lung machine. In a single dog, for example, there was an oxygen difference of 15 vols.% between the venous blood entering the machine and the arterialized blood leaving it. And, since the rate of blood-flow through the machine was 1 litre a minute, approximately 150 c.cm. of oxygen a minute was introduced.

In order to determine if benefit followed from the extrapulmonary addition of oxygen six dogs were made anoxic by reducing the concentration of oxygen in the inspired air, replacing it with nitrogen. Venous blood, removed from the distal inferior vena cava, was returned after arterialization into the femoral artery in two dogs, into the thoracic aorta in two dogs, and into the superior vena cava in two dogs. The rate of perfusion did not exceed 1 litre a minute.

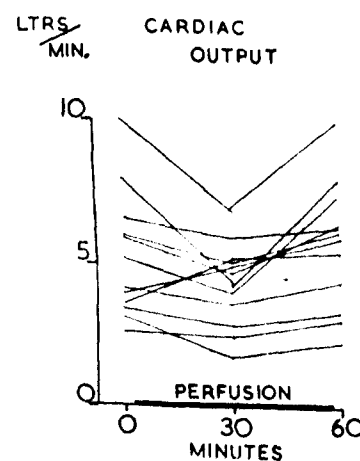


Fig. 7.—Cardiac output in 12 dogs before, during, and immediately after perfusion.

In each case oxygen was introduced into the circulation, but striking differences were revealed in the three pairs of dogs (Fig. 8). In the first two dogs, when the perfusion was returned into the femoral artery, there was little apparent effect on the oxygen content of the carotid artery blood, and the cephalic end of the dogs remained anoxic. After the animals had been breathing pure nitrogen for ten minutes the oxygen content of this blood had fallen to 23%. At the same time, however, the caudal end received an abundance of oxygen from the artificial lung, blood returning to the machine from the distal inferior vena cava being 65% saturated.

The perfusion was stopped at this point and complete anoxia maintained until cardiac arrhythmia and respiratory arrest had occurred. Resumption of the perfusion then restored respiration in both dogs and induced a normal heart-beat in one. The oxygen content of the carotid-artery blood was at this time identical with that of blood leaving the machine. In the second animal the heart ceased to beat after a short period of ventricular fibrillation, but perfusion was continued for two and a half hours, during which time natural respiration continued and the tongue and pupillary reflexes remained active.

In the second two dogs, in which the artificial circulation was returned into the aorta proximal to the splanchnic and renal arteries, a good perfusion of the cranial vessels was obtained, and the carotid-artery blood content did not fall below 50% even when pure nitrogen had been inspired for ten minutes.

In the last two dogs, in which arterialized blood was returned into the superior vena cava, the carotid-artery blood content was 52% ten minutes after exclusion of oxygen from the inspired air.

Discussion

The use of 6% dextran in sodium chloride to charge the heart-lung machine greatly contributes to its effective application to animal experimentation. The collection of blood from donor dogs, and its accurate cross-matching, is a difficult problem. In the five experiments in which donor blood was used, hypotension occurred when the contents of the machine were introduced into the circulation. We were not able to account for this, and it was concluded that an unknown factor in the donor's blood was responsible. The barbiturate used to anaesthetize the donor, the presence of products associated with exsanguination, bacterial contamination, and serological and cellular incompatibility were all possibly implicated.

No effects other than haemodilution and a resulting anaemia followed the use of dextran solution. The fall in the number of red cells is undoubtedly due to this deliberate haemodilution, for were the sole cause haemolysis the fall would not have exceeded 0.3%, and would not have been measurable. Of course it may be argued that no account is taken in the calculation of the fact that haemolysed blood may be fixed in the tissues. However, even if a figure of 200 mg. per 100 ml. is taken as the level of haemolysis, a figure considerably larger than any found in *in vitro* experiments, the fall in the red-cell count would only be in the order of 1%.

The amount of haemolysis is of no real consequence. No deleterious effects are to be expected from the liberation during perfusion of relatively minor quantities of haemoglobin. Much greater amounts have been administered to human beings without harm (O'Shaughnessy, Mansell, and Slome, 1939).

Deliberate haemodilution also accounts for much of the fall in the number of circulating platelets, which is too small to be of significance, but it cannot be responsible for the magnitude of the change in leucocyte values. Considerable destruction of circulating white cells does occur, and the resulting leucopenia may constitute a grave impediment to continuous perfusions over long periods. This problem is being studied at the present time, though it is evident

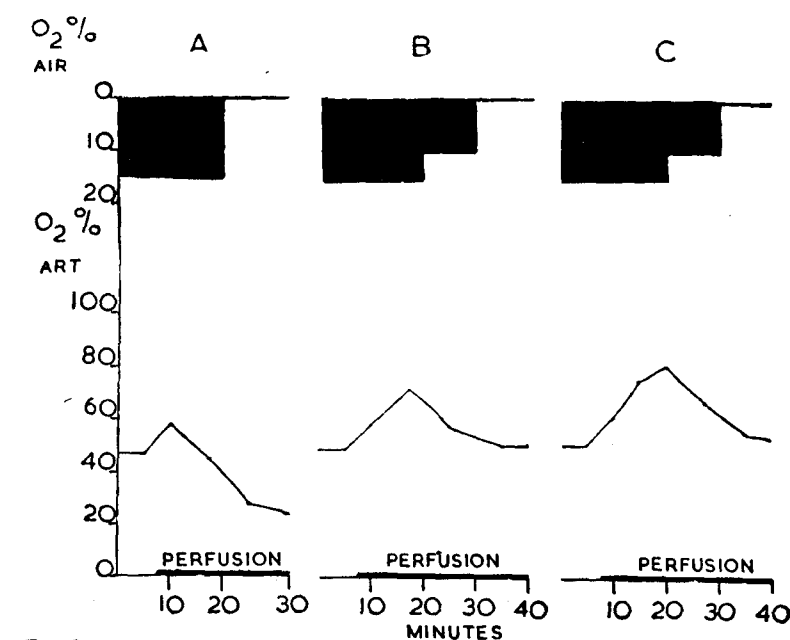


Fig. 8.—Percentage saturation of carotid artery blood in three dogs, A, B, and C, in which anoxia was induced by reduction of oxygen in the inspired air. Artificially arterialized blood was returned into the femoral artery in A, into the thoracic aorta in B, and into the superior vena cava in C.

that perfusions of short duration, such as are reported, need not be rejected on account of their effect on the leucocytes.

The alterations in the electrolyte balance are of a very small order, and in the main are caused by the addition of unbalanced fluids to the circulation, and by the absence of an accurate means of adjustment of the carbon dioxide tension in the oxygenator. The first is easily rectified, the second awaits the development of a device capable of regulating the carbon dioxide tension from the pH of the circulating blood. A device of this nature has been successfully exploited by Miller, Gibbon, and Gibbon (1951).

No untoward physiological effects accompany the shunting of a part of the natural circulation through the heart-lung machine. Changes in arterial pressure, pulse, and respiration rate are slight, and animals appear clinically unaffected by the procedure. Cardiac output determinations seem to indicate that a fall occurs when the perfusion is running, though it would not be wise to claim too much from these results, which are not statistically significant. In carrying out these determinations much difficulty was encountered in establishing a satisfactory baseline, particularly when pentobarbitone sodium was used as an anaesthetic. The smallest variation in the depth of narcosis altered the cardiac output, and we rarely achieved a uniform depth throughout the procedure. Even though the doses of pentobarbitone sodium were adjusted according to the weights of the animals the dogs did not all react in the same fashion. In some the dose was more than enough and produced deep anaesthesia, while in others it did no more than produce light narcosis. Even when anaesthesia was produced by cyclopropane, administered by a skilled anaesthetist, three hours of carefully regulated anaesthesia was required before two consecutive cardiac outputs proved to be identical.

Oxygen can be introduced into the blood stream by this method, and the extrapulmonary addition is of benefit to dogs made anoxic by a reduction of oxygen in the inspired air. The site of return of artificially arterialized blood is of great importance, and should be either into a central vein or into an artery close to the heart.

For these reasons it is felt that the heart-lung machine is now ready for clinical trials in selected cases of extreme cardio-respiratory dysfunction. In those patients in whom derangement of pulmonary function is the chief symptom, it may be advantageous to return the arterialized blood into a central vein, thus greatly simplifying the cannulation and making the surgical intervention a relatively minor one. Though no shunting of blood around the heart would occur in this technique, it is possible that the improved oxygenation would reduce the demands on the heart, and secondarily reduce its work.

Where the myocardium is primarily involved it is suggested that continuous venesection with return of arterialized blood into the arterial circulation will relieve the heart of part of its burden.

APPENDIX I

The oxygenator and connecting-blocks were chemically sterilized with "roccal" detergent and 3% formalin, being steeped in the solution for twelve hours. The tubing and cannulae, which we used only once, were autoclaved. After assembly the apparatus was washed with at least 40 litres of sterile distilled water to which had been added enough sodium chloride to provide approximate isotonicity. Frequent checks for the presence of formalin provided an indication of the efficiency of the washing process. When two checks were negative the wash-outs were discontinued and the apparatus was charged with donor blood or dextran solution. After circulation through the by-pass tube to ensure that no air bubbles remained in the arterial line, the machine was ready for use.

APPENDIX II

1. The arterial and venous blood oxygen were measured by the method of Van Slyke and Neill (1924).
2. The red-cell, platelet, leucocyte, differential, and Arneht counts were made, and haematocrit values found by standard methods (Dacie, 1950).
3. The plasma haemoglobin was estimated as oxyhaemoglobin on a Spekker absorptiometer modified to accept 1 by 6 in. (2.5 by 15 cm.) test-tube cuvettes. A standard oxyhaemoglobin curve was prepared for each estimation in the following manner: 3-ml. aliquots of plasma were placed in each of five cuvettes; to the first was added 8 ml. of dilute ammonia reagent (5 ml. concentrated NH_3 per litre), and this served as a plasma blank; to the remainder was added 0.02, 0.04, 0.06, and 0.08 ml. of whole blood diluted 1 in 2 with normal saline; these were then diluted with 8 ml. of ammonia reagent and read against the plasma blank. 3 ml. of plasma obtained from samples taken during the experiment was similarly treated and compared with the standard curve.
4. The plasma sodium and plasma potassium were determined by means of an internal standard flame photometer similar to that described by Berry, Chappell, and Barnes (1946).
5. The plasma chloride, plasma CO_2 combining power, blood sugar, and blood urea were estimated by standard methods (King, 1951).
6. The pH was measured by a Muirhead pH meter type D-303-b.

We would like to express our gratitude to the President and Council of the Royal College of Surgeons of England for their kind permission to work at the Buckston Browne Research Farm, Downe, Kent, and to Sir Arthur Keith and Professor David Slome for their many kindnesses to us while working there. We are indebted to the directors of Messrs. A. C. Cossor Ltd. for their generosity in placing a direct-writing electrocardiograph at our disposal.

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POST-INOCULATION POLIOMYELITIS

BY

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The successful prophylaxis of diphtheria through the mass immunization of very young children with diphtheria toxoid was associated with few mishaps of importance. When given subcutaneously, the alum-precipitated toxoid commonly gave rise to a painless nodule which was gradually absorbed, but occasionally there was an inflammatory swelling and very rarely a sterile abscess. These rare reactions to the toxoid were minimized by intramuscular administration, a route which was necessary for the injection of the pertussis vaccine introduced in 1946 and of combined diphtheria toxoid and pertussis vaccine made available in 1947. Since then the latter product has been increasingly used to immunize children simultaneously against diphtheria and whooping-cough by one series of injections.

In 1948 Martin (1950) observed flaccid paralysis of the arm in two children, each of whom had received an inoculation of a prophylactic in the paralysed limb within the preceding three weeks. Having traced and studied 15 other patients who had developed limb paralysis following injections of antigens in 1944-9, he concluded that all of these had really suffered from poliomyelitis. Gale (1950) was able to add 56 cases of limb paralysis following the inoculation of prophylactics, and then, independently and simultaneously, McCloskey (1950) and Geffen (1950) published their findings during two epidemics of poliomyelitis in 1949. In Melbourne, McCloskey found that 35 out of 340 patients with poliomyelitis had been inoculated against diphtheria or whooping-cough within three months before the onset of the illness, and that the paralysis affected the inoculated limb in 24 out of 31 patients about whom full information was obtained. Geffen reported that out of 182 poliomyelitis patients under 5 years of age in London, 37 had been recently inoculated and about 30 of these suffered from paralysis, affecting particularly the limb recently injected. Investigating a small group of the London children, MacCallum (1950) was able to isolate the poliomyelitis virus from the stools of two children with paralysis of a recently inoculated limb and from three other inoculated children suffering from poliomyelitis without paralysis. Hill and Knowelden (1950) carried out a statistical inquiry, covering 33 areas, into the incidence of paralysis as a sequel to recent inoculation in 1949, and concluded that this misfortune occurred more frequently within a period of one month after the inoculation than could be attributed to chance.

On the other hand, Culley (1951) could find only nine recently inoculated persons among the 380 Welsh

patients with poliomyelitis in 1950 and only four of the nine with paralysis in the inoculated limb. In Scotland, Sutherland (1952), studying 43 cases of poliomyelitis following inoculation in 1950, could not show that inoculation increased the risk of a child developing poliomyelitis, although he found that the paralysis was suggestively but not significantly associated with the limb most recently injected. From both the academic and the practical point of view, the present position is best summarized in the advice of the Chief Medical Officer of the Ministry of Health (1952), that in any area in which poliomyelitis is exceptionally prevalent inoculation of diphtheria and pertussis antigens should be suspended for a time.

Poliomyelitis on South Tyneside

In the spring of 1952 a local epidemic of poliomyelitis began on Tyneside, centred mainly on the south side of the river. This outbreak witnessed the resumption of the classical age distribution of the disease, for two-thirds of the patients were under the age of 5 years. The districts chiefly involved were Gateshead (population 115,000), and the

contiguous districts of Felling (population 25,286) and Whickham (population 23,116). Poliomyelitis was confirmed in 91 patients from Gateshead, 28 from Felling, and 13 from Whickham. All these districts are normally served by Sheriff Hill Isolation Hospital, in which 112 of the patients were treated along with six cases from other areas.

In the last week of March and during April, four children were admitted to hospital at intervals for investigation of an illness which was at first diagnosed as "viral encephalitis" but later revised to polio-encephalitis in the light of further developments. The first patient with unmistakable poliomyelitis became ill with a sore throat on May 2, 1952, and was admitted to hospital on May 6 with flaccid paralysis of both legs. During May, 8 non-paralytic and 2 paralytic cases of poliomyelitis were later admitted from the three districts, to make a total of 15, of whom three were paralysed. Two of the three paralytic children had recently been inoculated. Intramuscular inoculations were therefore stopped in the Gateshead clinics, and local practitioners were advised on June 3 to restrict immunization to the subcutaneous use of A.P.T. and P.T.A.P. Confirmed cases of poliomyelitis in June numbered 38, and it was evident that the infection was widespread throughout the area. In July,

Poliomyelitis Following Inoculations—South Tyneside, 1948-52

Year	Patient and Area	Age in Years	Inoculation			Poliomyelitis		
			Antigen	Date of Injection	Site	Onset	Clinical Summary	Last Assessment
1952	H.S. (G)	11/12	D & P 0.5 ml.	24/4/52 (second)	Left arm	10/5/52	Fever, complete loss of power left shoulder-girdle and arm. Slight movement of fingers. C.S.F., 2 polymorphs per c.mm.	22/9/52: paralysis of left shoulder, extensors of elbow, and flexors of wrist and fingers
	R.H. (G)	1 2/12	D & P 0.5 ml.	16/5/52 (first)	Left buttock	1/6/52	Off foot; drowsy; paresis left quadriceps. C.S.F., pleocytosis and increased protein	2/7/52: complete recovery
	M.J. (G)	1 10/12	D & P 0.5 ml.	20/5/52 (second)	Left arm	4/6/52	Restless; vomiting and retention of urine followed by neck stiffness with paralysis left shoulder and arm, except fingers. C.S.F., increased cells and protein	19/9/52: paralysis and wasting left shoulder muscles, biceps, and triceps
	E.S. (G)	1 4/12	D & P 0.5 ml.	20/5/52 (third)	Right arm	17/7/52	Pyrexia, irritability, neck stiffness with paralysis right shoulder and upper arm. C.S.F., pleocytosis and increased protein	22/9/52: paralysis of right shoulder, biceps, and triceps
	M.B. (G)	4	D 0.5 ml.	17/6/52 (booster)	Right buttock	20/6/52	Headache, fever, neck stiffness, off feet, loss of tendon reflexes right leg but no paralysis. C.S.F., increased cell count only	5/7/52: perfect recovery
	P.H. (W)	5	D 0.5 ml.	5/5/52 (booster)	Left arm	23/5/52	Headache, fever, neck stiffness, pain in left calf, proceeding in 5 days to paresis both arms and left leg. C.S.F., increased cells	9/10/52: normal range of joint movement, but left deltoid muscle very weak
	V.C. (F)	2	D 0.5 ml.	26/6/52 (first)	" "	1/7/52	Vomiting, irritable, listless, paralysis of left external and right internal rectus muscles, with spasm of right neck muscles. C.S.F., increased cells	1/8/52: complete recovery
	A.B. (F)	9	D 0.5 ml.	29/5/52 (booster)	" "	14/7/52	Headache, weakness of legs, and vomiting, frequency of micturition. 17/7/52: paralysis extensors right ankle. C.S.F., pleocytosis and increased protein	12/9/52: slight right foot drop; otherwise walking well
1950	J.L. (G)	1 5/12	D & P 0.5 ml.	31/5/50 (second)	" "	10/6/50	Diarrhoea with paralysis left arm on 16/6/50. Out-patient treatment only	13/9/52: wasting and paresis of left deltoid, biceps, and triceps
	A.P. (Wn)	11/12	D 0.5 ml.	6/7/50 (first)	" "	19/7/50	Earache followed by diarrhoea. 29/7/50: paralysis of both arms with neck stiffness. C.S.F., increased cells and protein	18/9/52: paresis both deltoids, with wasting more marked on left side; slight wasting left thigh and eversion of left foot and slight drag in gait
	A.D. (G)	10/12	D & P 0.5 ml.	31/7/50 (first)	Left thigh	31/7/50	Feverish on 31/7/50, drowsiness, vomiting. 5/8/50: neck stiffness, paresis of left facial muscles, and internal squint of right eye. C.S.F., pleocytosis and increased protein	5/9/50: complete recovery maintained until 1952
	J.T. (G)	11/12	D & P 0.5 ml.	26/6/50 (first)	Left arm	14/8/50	Feverish and vomiting. 16/8/50: paralysis left arm and shoulder. C.S.F., 1.2 polymorphs and 6 lymphocytes per c.mm.	15/9/52: no loss of movement shoulder or elbow, but paresis and wasting left deltoid, biceps, and triceps
1948	K.M. (G)	2	P 1 ml.	25/10/48 (third)	" "	7/11/48	Paralysis left arm and shoulder with irritability and stupor: spread to right arm except fingers on 15/11/48. C.S.F., 2 polymorphs and 3 lymphocytes per c.mm.	17/11/52: no movement of either shoulder-joint—left arm completely paralysed, including all fingers; right arm limited movement of elbow, wrist, and finger-joints; severe wasting of paralysed muscles. In special school

Areas: G = Gateshead; F = Felling U.D.; W = Whickham U.D.; Wn = Washington U.D. Antigens: D = Diphtheria; P = Pertussis.

August, and September confirmed cases numbered 50, 19, and 14 respectively, and thereafter only sporadic cases occurred.

In spite of the precautions, eight of the South Tyneside patients with poliomyelitis had previously been injected intramuscularly with an immunizing antigen not more than two months before the onset of the illness. All these were admitted before July 17, when the number of cases was 94.

The relevant details of the inoculated children are summarized in the Table on the previous page along with similar data relating to five examples of post-inoculation poliomyelitis in 1950 and 1948. Four were recorded among the 27 confirmed poliomyelitis cases on South Tyneside in 1950, while the fifth was a solitary patient who came to hospital two months after the notification of the last case in 1948.

After the end of May, 1952, 101 children were inoculated subcutaneously with A.P.T. and P.T.A.P., but none of these suffered an attack of poliomyelitis.

Comparative Incidence of Poliomyelitis in Recently Inoculated and Other Children in Gateshead in 1952

The total number of children aged 6 months to 2 years in the borough in mid-year, 1952, has been calculated from the births less deaths to be 3,097, among whom there were 17 cases of poliomyelitis, a ratio of 1 in 182. Of the 17 children, 13 presented some degree of muscular paralysis.

In April and May, 1952, 249 children, aged between 6 months and 2 years, received intramuscular arm injections in the Gateshead local authority clinics, and 105 others within the same ages received intramuscular inoculations from local practitioners in April, May, and early June—that is, a total of 354. Of this number, three aged from 11 to 22 months developed poliomyelitis in the paralytic form before the end of June.

Deducting the 354 inoculated children from the total, children of the same age not recently inoculated number 2,743, of whom 9 developed poliomyelitis in May and June, 6 being affected by muscular paralysis. The attack rate in recently inoculated children was therefore 1 in 118, as compared with 1 in 305 in non-inoculated children. During July another case of paralytic poliomyelitis occurred in a recently inoculated child and 3 cases in the control group, of whom two were paralysed. The comparative incidence in May, June, and July was therefore 1 in 88 for the recently inoculated and 1 in 228 for the control group. As an additional paralytic case occurred in the control group in August, the respective attack rate over the four months May to August remained 1 in 87 among the recently inoculated and increased to 1 in 211 in the controls.

Two of the children, E.S. and N.S., who developed a limb paralysis following an injection of antigen in April were previously inoculated in March, both in the left arm. Although these March injections were given one week before the first case of poliomyelitis in 1952, and E.S. was paralysed in the right arm, it seems advisable to recalculate the incidence of the disease in children inoculated in the months March to June.

In March, 53 children of the age group under study received intramuscular inoculations at the clinics and 43 others received similar injections from the general practitioners. Out of 450 children inoculated in the months of March, April, May, and June, 3 developed poliomyelitis in May and June, giving a ratio of 1 in 150. Of 2,647 children of the same age who had not been recently inoculated 9 developed poliomyelitis in these months, a ratio of 1 in 294. When this comparison is extended to include July there were 4 cases in the inoculated, or 1 in 112, and 12 cases among the others, or 1 in 221. Including the August case among the controls, the respective incidence rates for May to August were 1 in 112 for the inoculated and 1 in 204 for the others. As no other child of these ages contracted poliomyelitis, the last-mentioned attack rates cover the whole epidemic. The 13 children in the control group who contracted poliomyelitis were aged from 6 months to 1 year and 10 months. Only two of them had in fact ever been inoculated, the prophylactic injections having been given

in the autumn of 1951. In spite of the smallness of these numbers, I feel that they are reasonable in assessing the risk of a child developing poliomyelitis as being at least doubled as a result of intramuscular immunization during an epidemic.

In the 4 recently inoculated Gateshead children the paralysis was limited to the injected arm in three instances and the injected leg in one. In contrast, the 9 patients with paralytic poliomyelitis among the control group of Gateshead children suffered paralysis affecting the trunk and all the limbs in two cases (one of whom died), the right arm, leg, and facial muscles in the third, the left face, eye, and leg in a fourth, one leg only in four instances, and the left external rectus muscle of the eyeball in the ninth.

Poliomyelitis in Recently Inoculated Persons

Analysis of the form of the disease in the 138 South Tyneside cases, so as to compare the recently inoculated patients with the remainder, gives this result:

Form of disease	Recently Inoculated	Others
Non-paralytic	1	70
Paralytic:		
Cranial nerves only	1	15
One arm only	2	3
One leg only	2	17
Both legs	1	7
Arms and legs	1	3
Trunk and limbs	—	6 (2 died)
Cranial nerves and limbs	—	5
Cranial nerves, trunk, and limbs	—	4 (1 died)
	8	130

Among the recently inoculated patients, paralysis affected solely the inoculated arm in 3 patients, the inoculated leg in one, and extended from the inoculated arm of a fifth patient so as to involve the opposite arm and a leg. In two patients paralysis was localized to the ocular muscles and to the right leg respectively, although the injection had been given in the left arm. Only 60 of the 130 patients not recently inoculated suffered a paralysis, and this much more often affected the legs than the arms.

Health of Contacts

As it is well known that poliomyelitis becomes manifest in only a small proportion of the individuals who have been infected, it is common to find that familial contacts of patients suffer from illnesses which are presumably abortive attacks of poliomyelitis. It is rare, however, in urban areas to find two cases of undoubted poliomyelitis from the same family.

Among the 8 families of children with post-inoculation poliomyelitis two, those of E.S. and P.H., are notable for associated illnesses.

Family of E.S.—E.S., aged 1 year, was inoculated in the left arm on February 12 and March 11, 1952, and in the right arm on May 20, with combined antigen. She became ill on July 17 with paralysis of the right shoulder and upper arm. She was admitted to hospital on July 18 along with a brother Eric S., aged 6 years, who complained of headache and vomiting on July 17. On admission he presented an inflammatory exudate on the tonsils, a temperature of 100.6° F. (38.1° C.), but the cerebrospinal fluid was normal. He was considered to be a possible atypical case of poliomyelitis. Two weeks before, an older brother, H.S., aged 11 years, was ill with a high temperature lasting for 24 hours.

Family of P.H.—P.H., aged 5 years, inoculated in the left deltoid on May 5, 1952, with a "booster" dose of A.P.T., became ill on May 23 and was admitted to hospital on the 25th with pyrexia, marked signs of meningeal irritation, and an abnormal cerebrospinal fluid. She developed paresis of both arms and the left leg on May 28, the left arm being the more severely affected. Her sister, M.H., aged 2 years, became ill on May 22, with pyrexia, neck stiffness, and irritability, which persisted until the 28th, when she also was admitted to hospital, making a very rapid recovery in the following three days. In her case the cerebrospinal fluid showed a raised protein content only. Still another child in this house, aged 6 years, complained of pyrexia, headache, and neck stiffness, beginning on May 22, but she was convalescent when her sisters were removed to hospital.

On examining the family histories of the remaining 129 poliomyelitis patients who had not been inoculated recently

there was only one example of two siblings with frank poliomyelitis and one family with a possible double infection.

Family of Sw.—T. Sw., aged 2 years, became ill on July 9, 1952, with drowsiness and irritability accompanied by vomiting. On admission to hospital on July 16 he presented neck and spinal rigidity and loss of the tendon reflexes of the left leg, but he was able to move all his limbs. The cerebrospinal fluid showed an increased cell count and a raised protein content. On July 20 the patient showed a definite weakness of the muscles of the left ankle joint. A sister, G. Sw., aged 4 years, became ill on July 11, with vomiting, fever, and fretfulness, and complained of headache and backache. When admitted to hospital on July 19 there were signs of meningeal irritation but no paralysis. The cerebrospinal fluid showed a pleocytosis of polymorphs and lymphocytes and a raised protein content. This child was fully convalescent on July 27.

Family of M.—The patient D.M., aged 1 year, became fretful and off-colour on August 2, 1952, and was admitted to hospital on August 6, when he presented neck stiffness, minimal pyrexia, and weakness of the right hip muscles, together with a slight increase of cells in the cerebrospinal fluid. This child was not definitely paralysed, but the muscles governing the movement of the joint were all weak. Two weeks previously a sister, aged 3 years, was very restless and had a bout of vomiting, and was thought to have been an abortive case.

Among the 8 households of the recently inoculated patients one can find two with multiple illnesses in the family. In these, the two recently inoculated children suffered paralysis of the injected arm. To find two other instances of multiple illness one has to review the background of the other 129 patients. In these the paralysis affected the lower limb in two children and was slight. It seems probable that all three of the children in each of the households of E.S. and P.H. had been infected with the poliomyelitis virus, and that it was the recent inoculation which determined the appearance and the site of the paralysis.

Intervals between Inoculation and Onset of Poliomyelitis

In 5 of the 8 recently inoculated patients of 1952, paralysis was definitely related to the site of the preceding injection, whereas there was no paralysis in one, and paralysis remote from the inoculation in two. The intervals between the injection and the onset of symptoms in the former patients were 15, 16, 16, 18, and 58 days respectively. In contrast, the respective intervals were 3, 5, and 46 days in the latter three cases. Turning to the 5 patients of 1948 and 1950, the relevant intervals were 10, 13, 13, and 18 days in the cases with paralysis involving an inoculated limb, and in the exceptional case the onset of polio-encephalitis coincided with the inoculation. This divergent finding raises a strong probability that the relationship between the preceding inoculation and the subsequent localized paralysis was one of cause and effect in the group of 8 patients showing intervals of 10 to 18 days between the inoculation and the onset of symptoms, whereas the association was purely a coincidence in the 3 patients in whom the respective intervals between the inoculation and the onset of illness were 5 days or less.

There remain two patients with lengthy intervals between inoculation and illness. In one of these the relationship between inoculation and paralysis may also have been causal.

Site of Injection

In the 1952 group of 8 recently inoculated patients, the upper-arm paralysis following injection tended to be fairly severe and lasting, whereas the paresis of the leg following previous injection of antigen in the buttock was very transient. Studying all the 13 cases of poliomyelitis following recent inoculation, it is notable that antigen given intramuscularly in the arm on 10 occasions was followed by severe paralysis limited to the arm in 5 patients and by more extensive paralysis involving both arms in 3 others. All these 8 patients have or are likely to have some degree of permanent disability. On the other hand, in 3 patients inoculated in the buttock or thigh only one showed paralysis of the injected limb, which was transient. All the 5 post-inoculation cases of paralysis limited to the injected arm

were of a severity and permanence not observed in the three single-arm palsies among the 129 patients not recently inoculated, in whom the affected muscles showed a transient loss of power without any residual disability. In the 3 cases of more extensive paralysis following the injection of an arm, paralysis started and was most severe in the injected limb, whence it spread to the opposite arm and thence to other muscles. Although the issue here is clouded by the time relation between inoculation and subsequent illness, the relative severity and persistence of the damage to muscles of the arms in post-inoculation poliomyelitis were impressive.

Prophylactics Used

In the 13 cases of post-inoculation poliomyelitis, paralysis followed the use of diphtheria alum-precipitated toxoid, pertussis alum-precipitated vaccine, and combined diphtheria toxoid and pertussis vaccine.

The dose injected was taken from multiple-dose containers of 5 ml. and 10 ml. Two patients, E.S. and M.J., probably received antigen from the same container, but otherwise each patient was the sole poliomyelitis case associated with a multiple-dose container. The worst case was K.M., to whom the largest dose of antigen, 1 ml., had been given, with a severe local reaction.

During the summer of 1952 many intramuscular injections of penicillin, streptomycin, and other medicaments must have been given to Gateshead patients, both children and adults, in hospital wards and departments and at home, for the treatment of various conditions. In only one instance was there a suspicion that intramuscular injection of a substance other than a prophylactic antigen might have precipitated paralytic poliomyelitis. In this instance, a child of 6 months admitted to hospital with pneumonia on May 30, 1952, was given penicillin by injection into the buttocks alternately before June 5. In convalescence a flaccid paralysis of the right leg was first noticed on June 14, and the cerebrospinal fluid taken on July 21 showed an increase of cells and a slightly raised protein.

Discussion

The Gateshead experience must be added to the London and Melbourne evidence against intramuscular inoculation with diphtheria and whooping-cough antigen as a causal factor in the development of paralytic poliomyelitis affecting particularly the limb previously injected. In Gateshead as in London, the upper limbs were much more frequently affected in the recently inoculated than the legs, and the left arm more often than the right—features quite contrary to the usual distribution of paralysis of poliomyelitis. This can be accounted for only by the traditional use of the left arm for all the immunization procedures.

That the patients with whom we are concerned in Gateshead were in fact cases of poliomyelitis cannot be doubted. They were all diagnosed as such on clinical grounds, for they showed an involvement of the motor neurones and a complete absence of sensory disturbance, together with the changes of the cerebrospinal fluid and many of the common symptoms and signs of this disease. They occurred at a time when poliomyelitis was prevalent, and their numbers were proportionate to the intensity of prevalence. I have, too, been able to cite the simultaneous occurrence of non-paralytic and post-inoculation paralytic poliomyelitis in the same household.

Although mass immunization against diphtheria started in Gateshead in 1941, there were no recorded cases of post-inoculation paralysis among the thousands of children inoculated. This seems to be largely true of the millions of children in the country who were immunized before and after 1941.

The indications are that these mishaps became so numerous as to attract general attention in 1949, a year when poliomyelitis was prevalent in England. Yet in 1947, also a year of high prevalence of this disease, cases of post-inoculation paralysis were very few, if in fact they occurred. It seems that the change in frequency of the misfortune of

post-inoculation paralysis may have been associated with the increasingly popular use of the pertussis vaccine, alone or combined with diphtheria toxoid. It is worthy of note that these antigens were given by the intramuscular route.

Although there is ample room for speculation and research regarding the pathology of post-inoculation paralytic poliomyelitis, the convenient explanation is that muscle trauma due to inoculation enables the virus already present in a patient to attack the motor cells in the spinal cord which innervate the muscles that have been damaged. This would mean that, as a sequel to previous inoculation during the outbreak of poliomyelitis, a number of non-paralytic, atypical, or symptomless cases of infection with the virus would be transformed into frank cases of paralytic poliomyelitis. There would then be an actual increase of the number of cases of paralytic poliomyelitis as a result of the common inoculation procedures. Statistical proof of this increased incidence has not been forthcoming in two national surveys, but this is understandable when one recalls that poliomyelitis seldom shows a national prevalence, and information has to be gathered second- or third-hand about a disease notorious for errors of diagnosis. In a local epidemic it is difficult to get adequate numbers to offset the vagaries of chance.

Difficulties will also arise as a result of the recommended advice to suspend intramuscular inoculation during an epidemic, and there is, too, the further consideration that children who have been recently inoculated may acquire poliomyelitis during an epidemic without this being related at all to previous immunizing procedures. If one could disregard the element of chance in the Gateshead experience of poliomyelitis in 1952, the risk of contracting the disease was doubled, if not trebled, for a child in the age group usually selected for primary immunization. If so, one-third to one-half of all the recorded cases of poliomyelitis following recent inoculation would present the disease as it might have occurred naturally, and the remainder would present the special feature of the localized paralysis in the limb injected. This, in fact, is what did happen to something like the proportions expected, a point which seems to justify the statistical comparison.

In Gateshead, patients developing poliomyelitis less than six days after inoculation were clinically similar to those with the naturally occurring disease, but in those who were inoculated more than 10 days and less than 18 days before the onset of symptoms the inoculated limbs showed the paralysis of the disease. This is in accord with the findings of McCloskey. In two patients with respective intervals of six and eight weeks, the findings were equivocal, but it seems that the effect of the muscle trauma may extend much longer than a period of three weeks.

The practical aspects of this problem require some attention. The advice of the Ministry of Health to suspend intramuscular immunization was acted upon fairly early in the Gateshead epidemic, but it could have been given three weeks before. Then 6 of the 8 cases of post-inoculation poliomyelitis would not have been recorded as such, and at least three cases of post-inoculation paralysis would not have occurred. Now that poliomyelitis has become the most important acute infectious disease, intramuscular immunization should normally be suspended at once on the appearance of the first case of paralytic poliomyelitis in any year, in order to allow an assessment of the trend of prevalence of the disease. The earlier in the year the first case occurs, the more important it is to follow this course, for poliomyelitis in the spring presages a severe visitation.

Manufacturers of prophylactics differ in their advice regarding intramuscular injection. One firm recommends deep intramuscular injection above the insertion of the deltoid; another recommends that this should be given on the outer side of the thigh; and a third leaves it to the physician to choose the site. Certain considerations suggest that all intramuscular inoculations of prophylactic antigens should be given in the buttock or thigh, as is the custom in hospital. It seems that the amount of trauma in the muscle may exer-

cise an effect on the severity and extent of post-inoculation paralysis. The smaller the muscle the greater the proportion of the whole muscle damaged by the injection of an irritant antigen. Local trauma will probably be more severe when an irritant antigen is injected into the deltoid muscle of an infant than when the same amount is injected into the gluteal or vastus muscles.

A further point concerns the observed tendency of the damage in the cord to spread locally so as to affect other muscles in the vicinity, to cross the mid-line so as to affect muscles innervated by the same segment of the cord and even to spread further. Now the fifth and sixth cervical segments of the spinal cord innervating the arms are continuous above with the segments supplying the diaphragm and below with those innervating the intercostal muscles. Thus respiratory paralysis in poliomyelitis is usually coupled with an arm paralysis. There is therefore at least a theoretical possibility that the possible spread of post-inoculation paralysis of the arm may involve the muscles of respiration, and that this has actually occurred seems to be demonstrated by three if not four of the cases reported by Geffen. Thirdly, it seems that the disability inflicted by an arm paralysis must be compared with that produced by paralysis of a corresponding degree and extent in the leg. Although there is room for controversy, it is felt that in modern conditions a paralysis of leg muscles which can be neutralized by modern orthopaedic appliances is to be preferred to a corresponding paralysis in the arm which cannot at present be compensated by appliances. These arguments indicate the election of the lower limb as the site for intramuscular injections.

It would, of course, be better still if all the prophylactic antigens were issued for use only after they had proved acceptable to the subcutaneous tissues, for proper subcutaneous administration would seem to avoid all the risk of inducing a subsequent paralysis. In the prophylactics incriminated in the matter under discussion, the presence of alum seems to emerge as the common factor. If immunizing antigens cannot be made suitable for subcutaneous administration, manufacturers would also be well advised to try to reduce the quantity of material to be injected, in order to minimize the amount of muscle trauma.

There is an obvious medico-legal aspect of the problem of post-inoculation poliomyelitis which concerns all who administer prophylactic antigens. In the interest of both patients and practitioners, it is particularly important that confirmed cases of poliomyelitis should be promptly notified in order that the medical officer of health may at once apprise and advise the practitioners of his area.

Summary

A number of cases of post-inoculation poliomyelitis personally encountered in Gateshead and district have been studied. It is concluded that there was no doubt of the increased risk to a child of developing a paralytic attack of poliomyelitis as a result of intramuscular immunizing injections at a time when poliomyelitis was prevalent.

A close look-out must now be maintained in every area for the appearance of poliomyelitis. Immediately the first confirmed case has been detected intramuscular immunization procedures should be halted for a short period so as to take stock of the situation.

Manufacturers of prophylactics should aim at the production of antigens which will be satisfactory in every way when given by subcutaneous injection.

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ACUTE APPENDICITIS IN INFANCY AND EARLY CHILDHOOD

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Bailey and Love (1949) begin their section on appendicitis with these words: "Over 3,000 persons die annually from acute appendicitis in England and Wales alone. Many of them are in youth or the prime of life. Practically all these lives could be saved if an early diagnosis were made, and, at this stage, the comparatively simple operation of appendicectomy carried out. The importance of the subject cannot be overstated." Recent years have seen an improvement in the saving of lives, though not necessarily in early diagnosis.

In this paper are reviewed 115 consecutive unselected children whose appendices were removed. They were admitted to the wards of the Westminster Children's Hospital during 1950-2. Thirty-two suffered from "recurrent" appendicitis. The remainder had appendices which were unequivocally demonstrated to be the seat of acute inflammation. All were under 12 years old.

It is not proposed to deal in detail with those in the "recurrent" group or with those over 5, but to make special reference to the 28 cases under 5. It should be noted that in those cases which have been called "recurrent" there was evidence, either macroscopically or microscopically, of past inflammation in the appendix. Cases in which a normal appendix was removed, either through erroneous diagnosis or during the course of some other operative procedure, are not included.

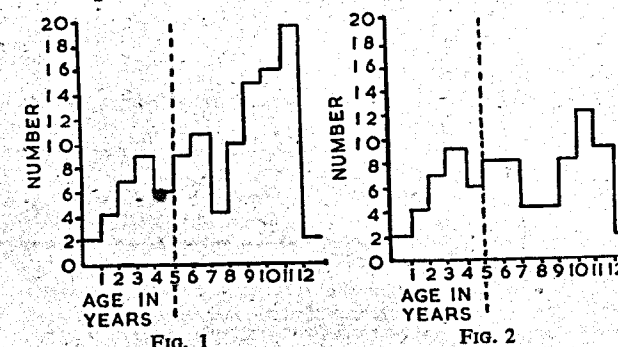


Fig. 1 shows the incidence by age of all cases. Fig. 2 does not include "recurrent" cases. It is seen that quite a high proportion of cases occur under 5, and that "recurrent" appendicitis was not observed at all in this group, which will be subjected to further scrutiny; and the Table sets out those at each age who had complicated appendicitis and in whom there was an

Age	No.	Complicated	Recent Upper Respiratory Infection	Presenting with D. or D. and V.
0-1 year	2	—	1	1
1	4	2	2	2
2	7	4	5	3
3	9	4	6	3
4	6	2	4	2
	28	12	18	11

antecedent upper respiratory infection, and the main presenting symptoms. Complicated appendicitis is taken to mean the presence of general or local peritonitis, including abscess formation, on admission.

Several facts now emerge. First, 28 (24%) cases occurred in children under 5, and among these the incidence of complicated appendicitis is high, being 43%; whereas in the older children the figure is only 18%. Secondly, a large number of children had diarrhoea, with or without vomiting as a presenting symptom, and in these there was a recent history of an upper respiratory infection. Such a history is often misleading, and judging from these cases it would seem that in the young child acute appendicitis is often missed.

The average duration of symptoms before admission to hospital was four days. Two typical case histories are given.

Case 1

A little girl aged 4 was seen one evening in the casualty department. Four days previously she had gone off her food, appeared listless, and complained of abdominal pain. She had recently recovered from a "sore throat," for which a course of penicillin injections was given, and was still having penicillin when her general symptoms appeared. Her temperature, which had fallen to normal limits, rose to 100-101° F. (37.8-38.3° C.) and the penicillin was therefore continued. She seemed to improve somewhat during the next four days but still complained of abdominal pain, and her bowels were opened several times, the motions being very loose. This state of affairs continued until she was brought to hospital.

On admission her temperature was 101° F. (38.3° C.), pulse 120, and she looked flushed and ill. On examination the abdomen was a little distended and did not move well with respiration. She was tender to palpation in the right iliac fossa and in the midline below the umbilicus, but owing to guarding nothing definite could be felt. On rectal examination, however, a tender mass could be felt high up on the right, and the finger of the glove was covered with mucus.

She was put to bed and kept under observation. By the next day her abdominal pain seemed less, and on careful examination the mass could also be felt through the abdominal wall. It was decided to treat her conservatively, and over the next three weeks the abscess gradually resolved. She was finally sent to convalescence and readmitted four months later, when a fibrotic and still slightly adherent appendix was removed.

Case 2

A boy aged 3 was admitted with a three-day history of abdominal pain, vomiting, and diarrhoea. At the onset he had started vomiting one evening after his meal. He was put to bed and later complained of abdominal pain, which woke him up. Early next morning he passed two very loose motions. On examination at that time he apparently had few physical signs beyond some tenderness across the lower abdomen. His temperature was 100° F. (37.8° C.). It was thought that he might have an enteritis, so a course of chloramphenicol was begun. His symptoms temporarily improved, but his temperature remained between 100 and 101° F. (37.8 and 38.3° C.). He had no further diarrhoea, but vomited twice the next day. His pain got no worse. The following day, however, he appeared much worse, the vomiting recurred, and his pulse rose to 130. The abdomen was by now distended and tense, and showed tenderness all over, especially below the umbilicus. He was immediately sent to hospital.

On admission his temperature was 102.4° F. (39.1° C.) and pulse 146. He appeared extremely ill with obvious peritonitis, the abdomen being tense, tender, and silent. At operation a spreading peritonitis was found with little or no attempt at localization, the cause being a gangrenous

appendix, which was removed. He was given aureomycin intravenously.

His convalescence was stormy and he had a further operation for the relief of small-bowel obstruction due to kinking from an adhesion. However, he was finally fit to go home nine weeks after his operation.

Treatment

Treatment has in no way differed from that now generally advised by all authorities. Immediate operation is carried out in all early acute cases. Those in whom an abscess has formed are treated conservatively unless spread demands drainage. The appendix is removed four to six months later. Those with peritonitis have had the remains of the appendix removed and the peritoneal cavity drained if the amount and character of the exudate warranted it. Drainage was needed in 9% of all the cases.

In one respect I find we differ from most other surgeons who have published series of similar cases—that is, in our use of Graham's incision, instead of McBurney's, as advocated by Mr. David Levi. We find it gives an extremely good exposure, is quick to make and close, and is easily extended if more room is required; also it does not imperil any nerves even if suppuration occurs.

In every recent series published the ultimate credit is given to the antibiotics. Certainly among our own patients there were several who would have undoubtedly died had it not been for these drugs—in particular aureomycin, which was given by intravenous drip. Doses of 100 mg. were given six-hourly, dissolved in 10 ml. of 1.95% leucine as supplied by the makers. Five to ten minutes were taken to inject the solution into the drip tubing to avoid undue pain and to minimize the danger of thrombosing the vein. Rapid injections, apart from quickly setting up an irritant thrombosis, cause such intense pain that even a comatose patient is aroused.

Wright *et al.* (1949) reported six cases of general peritonitis following ruptured appendicitis, all of which recovered with aureomycin. Olshaker *et al.* (1950), using the same drug, reported six similar successful cases aged between 4 and 8.

There were no deaths in this series, which, though the numbers are comparatively small, is encouraging.

A "spectacular" drop in mortality in the United States was observed by Slattery *et al.* (1950) even for the years during the war—from 14,113 in 1939 to 5,285 in 1946. This they attribute, amongst other factors, to the use of antibiotics and the principle of non-intervention in abscesses. Weiss (1950) reckoned that the total mortality in and around New Orleans had fallen from 15.2 to 2.9 per 100,000 in the last decade.

Pathology

We found that most cases of acute appendicitis in younger children were catarrhal in origin rather than obstructive. I have no records of some of the earlier cases, but in all those which were examined obstruction by faecalith or stricture was the exception. In the older children faecaliths were common.

The initial site of inflammation is in the lymphoid tissue of the wall—tissue which is far more abundant in youth, and which, like the mesenteric glands, often takes part in infection elsewhere. As already mentioned, over 60% of these young children give a history of recent tonsillitis, otitis, or a "cold." Babcock (1944) stated that "infections that produce general lymphoid hyperplasia often precede appendicitis." Scott and Ware (1945) denied this, but it seems common experience, in this country at any rate, that upper respiratory tract infections are frequently forerunners of appendicitis.

In addition, it must be realized that the margin of safety in the young is small. A thin-walled appendix containing a mass of lymphoid tissue through which infection spreads easily, and a small ineffective omentum, contribute to early perforation and wide dissemination of infection.

Discussion

Most authorities seem generally agreed in several points concerning this condition in childhood. First, acute appendicitis is not common in children under 5. Under 3 it is "rare" or "very uncommon." Reyes and Pascual (1950), reporting a series of 50 cases, found the youngest to be 6. Secondly, the diagnosis in early childhood is difficult. Thirdly, the mortality is high. The second of these points is undoubtedly true, but for the others there seems less justification at the present time.

Of our 82 patients, 28 (34%) were under 5, an incidence which cannot be regarded as uncommon. Abel and Allen (1950) reviewed 1,165 cases treated at the Bellevue Hospital, New York, and found that 165 were under 5. Morton and Kilby (1950) found an incidence of 20% in 100 cases at Newark, N.J.

Packard and McLauthlin (1951), reviewing 280 cases at the Denver Children's Hospital during the five-year period 1945-50, found that the average age of patients with peritonitis was 4.8 years. For those with simple appendicitis it was 8.6. Of their patients, 25% were 4 or under, and of this group 60% had local or diffuse peritonitis on admission. The only death among these was in a 3-year-old child with a ten-days history.

In searching for some explanation there would appear to be three main causes. First, the difficulties in diagnosis already referred to; secondly, the practitioner is often loath to diagnose acute appendicitis at this age, or thinks of some other condition first because he has been taught that it is uncommon. Such phrases as, "This child seems rather young for an appendix," or, "Could this be appendicitis at this age?" are often encountered in letters accompanying the patient to hospital. They betray the diagnosis as being late, and even an afterthought. Lastly, I believe the picture of appendicitis at this age to be changing: not because of any alteration in the disease itself but because of the widespread, and in some cases indiscriminate, use of antibiotics.

Difficulties in Diagnosis.—The four earliest signs are pyrexia, abdominal pain, vomiting, and local tenderness. Any of these may predominate, any may be absent, and any may be associated with one other symptom which is uncommon in the older patients—namely, diarrhoea.

Temperature and Pulse.—In a young child very little constitutional upset is enough to produce a considerable rise in temperature and pulse. It is often said that a high temperature associated with abdominal pain is rather against appendicitis and in favour of pyelitis. This is dangerously untrue, especially if a thorough examination of the urine is neglected. Half our patients had temperatures of over 101° F. (38.3° C.) and a quarter over 102° F. (38.9° C.). The pulse is proportionately raised—a ratio of 12 to each 1° F. (0.55° C.) rather than 10. The rate is not of such importance as a steady rise.

Pain.—This is notoriously difficult to assess in the very young. It is usually colicky or cramp-like and initially comes in waves, causing crying and screaming attacks with the knees drawn up. After a time it becomes continuous and the child lies characteristically curled up. Localization is also poor, and if the patient is of an age to understand the question he usually puts a hand on the umbilicus. Tenderness, on the other hand, is confined to the right iliac fossa, unless perforation has already occurred. In the early case a difference in "tension" of the two sides of the abdominal wall is more easily appreciated by very light palpation with the tips of the fingers. Strang (1950) recommends examination of the abdomen from behind with both hands while the child is held in the mother's arms in the natural nursing position. In this way we avoid a crying, frightened child in whom abdominal palpation is impossible. In other cases the bedclothes may be better. The disappearance of "abdominal" breathing and its replacement by "thoracic" respiration also occurs surprisingly early on, and must be

carefully looked for. The most dangerous aspect of pain is its disappearance when perforation occurs. The child, after what may have seemed a trivial abdominal disturbance, appears well for several hours. He may even show a desire for food or fall quietly asleep. The sinister sequence of a steadily increasing pulse and abdominal distension is all too early missed after the parents' and one's own conscience has been reassured. The following morning may be already too late. It is surprising not only how well many such patients appear at this stage but also how rapidly and alarmingly their condition may suddenly deteriorate.

Vomiting and Nausea.—These, with pain, form possibly the commonest manner in which the condition presents. But again a note of warning should be sounded. Reliance on the old axiom "Pain precedes vomiting" can easily mislead; for in many cases the sequence is reversed. Both may be absent.

Diarrhoea.—This may be a cardinal sign, and much more often than is generally supposed it is so. It may occur with or without vomiting. A diagnosis of enteritis or food-poisoning is fatally easy. How many of us have not had the humiliation of referring an unsuspected acute appendicitis to a fever hospital? Diarrhoea is often the first presenting sign in infants; the stool is very loose, often containing mucus, but never blood. It is due to the proximity of the appendix to the sigmoid or upper rectum. The child's pelvis is very small compared with the length and size of the appendix, and such contiguity may be demonstrated at operation. The caecum may be similarly irritated. Spurious diarrhoea coming on two or three days after the onset of pain, and consisting of small amounts of faeces-stained mucus, is pathognomonic of an appendix abscess. Rectal examination will reveal the mass. Auscultation, while it may show normal or near normal amounts of peristalsis, will not disclose the excited hubbub of the enteritic. Silence means ileus and peritonitis.

The High Appendix.—It is often loosely stated that in children the appendix lies high in the abdomen; sometimes under the liver. This may well be true, and every surgeon at one time or another has experienced confusion in diagnosis and difficulty at operation in removing such an abnormally placed organ. But the condition is a true abnormality. It is a defect in the last stage of the rotation of the gut. It is not common. Only two children in this series showed it, and in only one was it of a degree to cause trouble at operation.

It has been said that the surest sign of appendicitis is tenderness over the appendix, and the proper and usual place for the appendix is just above the brim of the pelvis in the right iliac fossa.

Finally, a point which I believe to be often responsible for the diagnosis being missed. If a child has sought medical aid because of inflammation remote from the peritoneal cavity the almost invariable treatment now afforded is an antibiotic, usually a sulphonamide or penicillin, although chloramphenicol is beginning to gain ground in popularity. The most dangerous complication of these chemicals is the masking of any extension of such inflammation and especially of abscess formation.

Should a metastatic lesion now develop, the classical signs are absent. There is little if any increase in constitutional signs. The appendix can perforate in comparative quietude and large quantities of pus collect without notice. This becomes doubly dangerous in the inarticulate young. As a result the picture of appendicitis is very different from that which used to be taught and expected in practice.

In conclusion it may be said that the only real safeguard is unceasing vigilance—a thorough examination if, and when, any abdominal symptoms develop, which may mean repeated visits even though this is onerous to a busy man.

Professor Aird (1949) has said that the old saying "Never wake a child at night to have an operation" is not dependable, and by the same token should be mentioned Mr.

Levi's maxim that "if abdominal pain in a child, associated with vomiting, lasts continuously for more than six hours and is unrelieved by an enema, he should be seen by a surgeon." Some may dismiss these as "rules of thumb." They may be—but they can be most helpful in times of doubt.

This renewed anxiety concerning the late diagnosis of these little children is not parochial. Packard and McLauthlin (1951) stated that "slower recognition of the diagnosis seems the most important factor in the markedly increased incidence of abscess and peritonitis in the infant and young child," and that "the high incidence of appendicitis with peritonitis in the very young child because of delay in diagnosis presents a challenge."

Riker (1950) out of 136 cases found 56 with rupture on admission: two died. He gives no figure for those in infancy, but states that there was "a high incidence of perforation in early childhood." Hawk *et al.* (1950) had 139 cases under 10. The youngest was 5 months old, and six out of eight children under 2 had peritonitis. There were no deaths in this series. In Reyes and Pascual's (1950) series 68% of cases under 10 had local or diffuse peritonitis. In Abel and Allen's (1950) 1,165 cases there was a 10% mortality in 165 cases under 5, as opposed to 2.9% in the remaining thousand. The majority of deaths occurred in the years before the war. Howard Williams (1947), of Melbourne, said of this condition, "Early diagnosis . . . will be established only by better clinical training of the student, family physician, and paediatrician." It would seem that the lesson has not yet been learnt.

Summary

A review of 115 cases of appendicitis is given; 82 had acute appendicitis. Special reference is made to those aged under 5. The high incidence (43%) of complicated appendicitis in this age group gives cause for concern.

Some difficulties in diagnosis are discussed and a plea is made for earlier diagnosis. It is suggested that the widespread use of antibiotics is changing the picture of appendicitis in the young.

I wish to thank Mr. David Levi and Mr. G. H. Macnab, of the Westminster Children's Hospital, for their helpful advice and criticism.

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Accident Prevention and First Aid in the Home, a 24-page illustrated booklet published by Messrs. E. & S. Livingstone, Edinburgh (price 1s. 6d.), indicates the commoner precautions that should be taken to prevent accidents in the home, and advises on the measures to be taken and those to be avoided if accidents should occur. Each point is driven home with a suitable illustration. The booklet is intended for mothers and those having the care of small children. It has been compiled by the surgical staff of the Royal Hospital for Sick Children, Edinburgh, and profits from its sale are to be devoted to the treatment of children brought to that hospital as a result of home accidents.

THE PRINCIPLES AND PRACTICE OF YAWS CONTROL

BY

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With the use of such a powerful and satisfactory drug as procaine penicillin in aluminium monostearate (P.A.M.) in the mass treatment of yaws, it may be useful to consider the principles and practice of yaws control based upon present knowledge. The realization of these possibilities is largely due to the work of the national and international staffs carrying out the W.H.O./U.N.I.C.E.F. Treponemal-disease Control Programmes.

The Principles of Yaws Control

I. Decision to Undertake the Anti-Yaws Campaign

This indicates that those in executive positions realize or have been convinced of the necessity for such a campaign. The purpose of the campaign will be the eradication of yaws from the community, not merely its reduction to some ill-defined low endemic level. The technique of the campaign must be adequate, scientifically sound, and economical. The campaign is a public health measure applied to the community and not a curative measure applied to the individual.

II. Decision to Undertake Activities After the Campaign Itself has Subsided

Experience in many parts of the world (Harding, 1949) has shown that this is, in practice, as important as the planning of the campaign itself if lasting benefit is to result. Failure to undertake post-campaign measures has often led to a return of the yaws incidence to the level preceding the control measures.

III. Planning and Execution of the Campaign Itself

These have become matters of skilful organization and careful supervision.

(i) A complete census of the whole population is made by the civil administrative authorities.

(ii) A medical survey of the whole population is then carried out so that all patients with infectious yaws and all persons likely to develop infectious yaws, especially during the next year, are recognized. This last group includes (1) all who have not yet had yaws but who have been in contact with infectious patients either in the household, village, school, or more remotely—the importance of these regions of contact varies with age (Soetopo and Wasito, 1953); and (2) all those in the latent secondary stage. The latent secondary stage is that in which a patient, who has had yaws, has no clinical manifestations at the time, has a positive Wassermann, Kahn, and other similar serological reaction in his serum, and has had no tertiary destructive lesions. At present this stage can be defined but not directly recognized.

(iii) Adequate treatment is given at the time of recognition on the survey to all patients in the above categories. A single intramuscular injection that will result in serological reversal is ideal.

If it once be recognized that it is a public health measure that is being carried out, there is no reason why, as a separate but concurrent measure, patients with other lesions due to yaws, or even other diseases, should not be treated. Such action must not jeopardize the success of the preventive measure that is planned to treat all

infectious and potentially infectious patients so that the source of infection will be eradicated and thus transmission stopped. A wider range of treatment, especially in areas where other treatment facilities are not readily available, may help to gain the co-operation of the people and thus facilitate the work of the campaign. In all large campaigns there might be certain areas where investigations are carried out with the purpose of improving the effectiveness of the campaign itself.

IV. Post-campaign Activities

These comprise: (i) At the very start of the campaign the establishment of rural dispensaries or small treatment centres to be staffed by trained medical auxiliaries under medical supervision. At these centres free treatment would be available for all yaws patients and perhaps some other diseases. Members of the staff, after the mass treatment, would make tours of inspection of the related villages to recognize and treat infectious yaws; cases of other diseases would probably be referred to the treatment centre. As the breadth of the work expands and more diseases are brought under control the therapeutic activities of these centres would become less important and the preventive ones more important, so that they may more appropriately be called "prevention centres." "Health centres" may be preferred by some, but a rather special meaning has become attached to these larger, more urban, and more complicated establishments, while "rural centres" may be suggested by others, but no non-urban population likes to be called "rural."

(ii) Measures to recognize and treat, and thus prevent, the reintroduction of the infection into the population from other areas, and also recognize and treat any patients who have developed infectious lesions since the mass treatment. These measures may involve some form of rapid survey of the whole population and treatment at three- to six-monthly or longer intervals and especially itinerant medical auxiliaries. There might well come a time when contacts of the few cases of yaws that are found would be sought.

(iii) The undertaking of further control measures against the next most important disease for which there is effective treatment available which can be given by the staff of the prevention centre. The high incidence of an endemic disease before a campaign may make its effective treatment numerically impossible at a small rural treatment centre. However, after effective mass treatment it should be easily dealt with at a prevention centre.

The need for post-campaign activities was first realized and demonstrated by Harding (1949) in Sierra Leone, but these were not fully described in his paper as published.

In his few reprints he added a typescript insertion. With the permission of his widow, who worked with him in the field, this is being published here. The addition by the late Dr. R. D. Harding follows the "Conclusion" on page 365 of his article:

"Though not strictly connected with yaws, the possibilities of carrying out other medical activities in rural areas in conjunction with a yaws campaign may be briefly outlined by indicating ancillary work actually done during 1946. By the end of that year seven dispensaries had been designed and their attendants trained to treat most ailments and the diseases endemic in their localities as well as sleeping sickness and yaws, while seven less ambitious dispensaries were designed to treat only sleeping sickness, yaws, wounds, ulcers, scabies, malaria, bilharzia, ankylostomiasis, ascariasis, and amoebic dysentery. Two maternity centres were built in areas where the chiefs and people were favourably disposed to this innovation and suitable girls were available for training as midwives. (The lady doctor and sisters of Segbwema Methodist Mission Hospital, situated in the vicinity, very kindly undertook their training.) On the health side, the nuclei of two new chiefdom headquarters villages were laid out and their construction supervised, to replace the old villages consisting of dirty and crowded huddles of huts. Wells were dug and springs impounded to provide an alternative water supply to the foul puddles previously used. Citrus, guava, pawpaw, and other fruit trees provided by the Agricultural De-

partment were planted round the dispensaries in the hope that in course of time the villagers would learn to appreciate these fruits and cultivate them themselves.

"During the year 40,250 cases of all kinds were treated at the yaws dispensaries. Of these 10,400 were yaws, 1,530 sleeping sickness, 700 bilharzia, 580 hookworm, 1,760 ascariis, and 660 amoebic dysentery. There were 260 confinements in the wards of the maternity centres (one of which only opened in October), and there were 3,300 antenatal and 4,700 baby clinic attendances. 74,000 people were examined by touring teams. The entire European staff comprised three medical officers for half the year and two for the remainder, but one of these was engaged for nearly the whole year on a special trypanosomiasis investigation. The overall cost, including salaries, equipment, buildings, transport, etc., but possibly excluding drugs and dressings for diseases other than sleeping sickness and yaws, was under £10,000. These activities would not have been possible without the confidence which the successful treatment of sleeping sickness and yaws had engendered, and the close contact between populace and staff arising from the mobile character of the campaign.

"The possibility of mass treatment or control of other endemic diseases by mobile teams was carefully considered, particularly gonorrhoea and bilharzia. Gonorrhoea is extremely prevalent, but apart from difficulties of accurate diagnosis, the prohibitive cost of penicillin on the one hand and the inadvisability of handing out sulphonamide tablets for patients to take home on the other made the project of mass attack on this disease quite impracticable; the end-result of an attempt at mass treatment would almost certainly have been a local trade in sulphonamides, demoralization of attendants, and the development of resistant strains of gonococci, without any marked or lasting lowering of the incidence of the disease. A study of the local epidemiology of bilharzia, which in one locality affected 75% of the population, would have been undertaken if the staff position had allowed, but it would no doubt have taken several years to evolve suitable methods of control over a wide region, and the money and personnel required would greatly exceed that necessary for controlling sleeping sickness or yaws over the same area. It therefore seemed better to concentrate available resources on those improvements in general sanitation and midwifery which were possible in the immediate vicinity of the dispensaries, together with the treatment there of those endemic diseases readily diagnosable and curable by attendants trained for the purpose and proficient in the use of the microscope and the syringe."

This principle, that an anti-yaws campaign must be made the means of improving rural health services, was more recently stressed at the First International Symposium on Yaws Control in Bangkok in March, 1952, by Troupin *et al.* (1953).

The Practice of Yaws Control

The application of the above principles may be briefly discussed under the same headings.

I. Decision to Undertake the Anti-Yaws Campaign

In many countries in the past, it is possible that the numerical, medical, or economic importance of yaws may not have been fully realized at executive headquarters, since it is a disease of the more remote rural areas. It may also have been realized that, although a few injections or arsenical or bismuth preparations might work temporary wonders, their effect as a rapid public health measure was poor. However, in some areas in the past relatively casual but widespread treatment with bismuth has, after some years, apparently resulted in a very considerable numerical decrease in yaws. Again, the populations of yaws endemic areas are usually undeveloped and have often not understood the importance of the disease to themselves and the need for more continued treatment than might appear obvious to them. It will be generally agreed that in all countries in which yaws is endemic there also occur several other diseases more important as causes of sickness and death. These may include malnutrition, tuberculosis, malaria, and schistosomiasis. All these factors militate against the initiation of anti-yaws campaigns. With the realization of the immediate effects and ultimate possibilities of successful yaws control by mass treatment with P.A.M., there is much greater encouragement to undertake these measures.

II. Decision to Undertake Post-campaign Activities

Unless the vital importance of these activities is realized at the start of the anti-yaws campaign they will not be included in the planning. Thus the purpose of the campaign will be lowered, with loss of inspiration to those engaged in it. Even if these post-campaign activities are later undertaken continuity may be lost. The interest and confidence of workers and populations may be weakened and ultimate success gravely jeopardized. Although the immediate purpose of the anti-yaws campaign is the eradication of yaws the ultimate purpose of the campaign must be the gradual but steady and secure improvement of the rural health services. When one step is approaching successful completion the next in importance that is within the financial resources of the community is started; thus each improvement gained is maintained with certainty.

III. Planning and Execution of the Campaign Itself

(i) *Preparation of the Census.*—This has now become a routine civil administrative process of well-established practice.

(ii) *Survey.*—Unless a survey is carried out there is no way of assessing either the need for the campaign or its success. It is, of course, upon the findings of the survey that the mass treatment is based; all the population must be examined so that all infectious and potentially infectious yaws patients can be treated. Research may reveal some technique, such as an intradermal test with specific antigens, which will make possible the recognition of the latent secondary stage. As anti-yaws mass therapy becomes better established it may be practicable to search for other diseases in the same survey.

In countries where the rural population lives mostly in large villages or small villages close together, surveys can best be made by arranging for the authorities concerned to have the inhabitants gather at a suitable place at a certain time. In Indonesia, where this is done, it has been shown that one simply trained local medical auxiliary can examine over 750 persons each week. Those suffering from yaws are directed to a near-by established clinic (Soetopo and Wasito, 1953).

Where, however, the villages are small and scattered or where the population live in widely dispersed houses this method is impracticable and house-to-house visits must be made. Guimarães (1953), of the Instituto Oswaldo Cruz, when working in the Baixade Fluminense, near Rio de Janeiro, used local persons, chosen for their intelligence and initiative, to make the house-to-house survey and to refer patients to the yaws treatment centre. This employment was part-time, and payment was made according to the number of patients found. However, the payment per patient was raised as the campaign progressed in an area and the number of patients greatly decreased. Since these persons relied largely upon their usual occupations for their living they naturally made their house-to-house inspections "after hours," which is the time most country folk are at home. Only local people could have found the houses. Perhaps in village communities in which the incidence of yaws is low house-to-house surveys would be the method of choice. The co-operation of the population and their leaders is essential throughout the campaign. This is possible only if the purpose of the campaign is understood and the campaign desired. This has been shown in combating African trypanosomiasis in places where the population has learnt its deadly nature. It is equally important that those engaged in the campaign itself should understand the outlook of the population and that there should be mutual sympathy.

(iii) *Treatment.*—This, ideally, would be a single intramuscular injection of a cheap, effective, and non-toxic drug. This would go far to win the co-operation of the population. There must be as little trespass upon the time of the population as possible. Their occupations may be mainly agricultural, but at many seasons of the year they will have

little time to spare to attend survey-treatment gatherings. In Yugoslavia mass treatment against epidemic syphilis is available in villages at any reasonable time throughout the day, so that the patients' activities are interfered with as little as possible.

The Committee on Venereal Diseases and Treponematoses, at the 4th session in London, July/August, 1952, recommended that "in mass campaigns against non-venereal treponematoses the minimal dosage for early infectious lesions in adults be no less than 1.2 mega units of P.A.M. [of approved standard] and proportionally less for children; that this dose be given in one injection and that the preventive (or 'abortive') dose for contacts be no less than one-half of that used in the early infectious stages of the established disease."

The staff of the prevention centre should be carefully selected from the local people and suitably trained under the same conditions of buildings, equipment, and supplies as they will have in the final appointment. This employment of local people—under, of course, some medical supervision—has in many countries been completely satisfactory. It is economical, and as nearly as possible ensures a contented staff. Their influence for good health can far exceed that due to their official duties.

Until some means of detecting the latent secondary stage has been evolved, one of three expedients might be used. Treatment might be given to: (a) all who have had active secondary lesions during the previous five years (Saunders, 1937); (b) all of the population under 18–20 years of age, which will include 80–90% of persons likely to suffer infectious relapses; (c) all children at schools and in the 2–6-year age group who have yaws or have a history of having had yaws (these may comprise 80% of the scholars in some endemic areas). This action would cover many "contacts" of the disease. Contacts outside these ranges would not be very important.

IV. Post-campaign Activities

(i) The establishment of rural dispensaries suitably located to serve the population—the prevention centres already referred to—may well be regarded as the most important achievement of the anti-yaws campaign. Perhaps it would not be extravagant to say that their establishment during the campaign is the first step, to which the campaign itself was only the way. The importance of these rural dispensaries with itinerant staff, which was clearly demonstrated by Harding (1949), cannot be overemphasized, and until their importance is realized much money and effort in anti-yaws work may still be wasted. Of course, if other established static units are already present they would become the centre of the development.

(ii) Prevention of the reintroduction of the disease into an area in which yaws had been controlled could best be achieved by extending the range of anti-yaws campaigns as widely as necessary. It should be regarded as absolutely essential to the success of any mass-treatment campaign that effective case searching and treatment facilities remain in the field, so that the few cases which are certain to occur during the following year may be dealt with. There is not, and probably will never be, any drug which in mass use will produce cure in all patients.

(iii) The carrying out of further control measures against other diseases that can be diagnosed and treated by the staff is the logical sequence of the stabilization of the campaign results and the rural dispensaries. All through these progressive achievements the education of the population in preventive matters would be taking place, even without the intentional efforts that would be made at every opportunity. There is an urgent need for the discovery of some educational technique which could be applied to health and other problems among undeveloped people. It is probable that the purpose of such a technique would be to create in the people a strong desire for the improvement that is intended. The late Dr. Harding's notes, published above, show what can be done and what should be planned for.

Summary

For a long time yet the sequence of census, survey, and treatment of yaws will be required. Procaine penicillin or some other depot preparation will, with difficulty, be improved upon. The importance of recognizing cases in the latent secondary stage of the infection must be emphasized; some way to doing this is urgently needed.

An anti-yaws campaign is only a means to an end, and that end is the gradual and stable development of improved rural health services. This alone can justify the efforts required to carry out an effective anti-yaws campaign. Such a campaign, in areas where yaws is endemic, is probably the best first step in the improvement of rural health services.

The work of the World Health Organization and the United Nations International Children's Emergency Fund in assisting treponematoses control work in various countries is of great importance, and is an encouragement for the future. Reynolds *et al.* (1951) discuss the ways this help can be most effectively applied.

Professor G. Macdonald, of the London School of Hygiene and Tropical Medicine, saw this article before publication and has made the following pertinent comments:

"I am convinced that the general principle is sound. The extension of such work depends on what is wanted. If what is wanted is to start a rural public health service, there is no doubt that the best way of doing so is through measures which are immediately obvious to the population as beneficial, and of course yaws is one of the more prominent examples. Credit earned by this such work could be used to persuade people not to accept other obviously less useful work. If I were starting such a scheme I would want a curative measure, such as yaws treatment of this nature, and also an environmental measure. Quite the best example of the latter is the application of residual insecticides in houses, which is appreciated at once for the effect on fleas and flies and later for that on malaria. I would therefore start with a yaws campaign and a residual insecticide campaign as initial steps towards a rural health centre service which undertook environmental and curative work. The approach, in the paper, to the curative side of it seems ideal."

This combined attack is being carried out by W.H.O. in Liberia.

I am deeply indebted to Dr. Kodijat and his staff in Indonesia, to Dr. F. Nery Guimarães, and to those whom I met of the Division of Sanitary Organization of the National Department of Health concerned with yaws control in Brazil, for information about their work.

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According to a report of the Committee on Child Health of the Scottish Health Services Council, only about 50% of mothers attend with their infants where child welfare clinics are provided. This is a matter of concern, although the report records a great improvement in child health in recent years. The importance of instruction in breast feeding and mothercraft is stressed. Every effort should be made to underline the value of immunization against certain infectious diseases. Recommendations are made regarding the management of premature infants: the report considers that breast-milk should be available to all infants in hospital, and that milk banks should be established where necessary. The report (*Child Health*) is published by the Department of Health for Scotland and is available at H.M. Stationery Office, price 2d.

EFFECT OF LARGE DOSES OF HISTAMINE ON GASTRIC SECRETION OF HCl

AN AUGMENTED HISTAMINE TEST

BY

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In the routine histamine test of gastric secretion the dose of histamine advised has been determined arbitrarily as being generally sufficient to provoke an acid response and generally free from liability to cause untoward symptoms. It is thus a compromise, and fails to take account of individual variations in susceptibility. This defect can be overcome by utilizing the group of synthetic drugs known as the antihistaminics.

These compounds have been shown to antagonize all histamine effects save that on gastric secretion. This interesting anomaly has been well demonstrated by the work of Halpern (1948). He has shown that, although guinea-pigs could be protected against the systemic effects of as much as 1,500 lethal doses of histamine, many animals died within a day or two as a result of gastric perforation.

The purpose of this paper is to describe the parietal cell response in man to large doses of histamine, the systemic effects of the drug being prevented by the use of an antihistamine. It will be shown that in this way it is possible to give a maximum stimulus to the parietal cells. An augmented histamine test of gastric secretion, based on this principle of maximum stimulation, is described and an analysis made of the results of 148 such tests performed on normal subjects and on patients with peptic ulcer.

Secretion of HCl after Increasing Doses of Histamine

Dosage.—Throughout this investigation histamine has been given subcutaneously as histamine acid phosphate in multiples of the usual body-weight (B.W.) dose of 0.1 mg. per 10 kg. body weight. Mepyramine hydrogen maleate ("anthisan") was chosen as the antihistamine. In a series of preliminary experiments it was found that, in order to protect the patient against the systemic effects of histamine, each body-weight dose of histamine had to be covered by 1 ml. of mepyramine (25 mg.). It was also found that the antihistamine should be given intramuscularly 30 minutes before giving the histamine injection. Thus, a patient about to be given four B.W. doses of histamine would have an intramuscular injection of 4 ml. of mepyramine 30 minutes previously.

Secretion Studies.—Secretion tests were begun at 9 a.m. following a 12-hour fast. A constant size of stomach-tube, having multiple perforations at its tip, was used throughout. The fasting juice was first aspirated by syringe, the position of the patient and the position of the tube being altered until the "residual pool" of gastric juice had been tapped. This achieved, the tube was fixed to the side of the face and the patient made comfortable in this position—usually reclining on the left side. Subsequent collection of gastric juice was made by continuous aspiration, using the suction provided by an electric pump. The spontaneous secretion was withdrawn for a control period of 45 minutes before giving mepyramine, and thereafter aspiration was continued for 30 minutes until the histamine injection was made. The volume of the gastric juice withdrawn in the 45-minute period after histamine was measured and the titratable free hydrochloric acid estimated. The

weight of HCl secreted in this time was then calculated and expressed in milligrams of HCl. All saliva was expectorated during these tests.

Effects of Increasing Dosage of Histamine.—With these standard conditions, one, two, three, or more B.W. doses of histamine covered by the requisite amount of antihistamine were given to each subject on successive days. The order in which the different doses was given was varied in each subject. This series of experiments was made on five "normal" males (hernia cases without history of dyspepsia) and on five male patients with clinical and radiological evidence of duodenal ulcer. In all, 77 separate secretion tests were made. The largest single injection of histamine given was the equivalent of 12 B.W. doses; thus one ulcer patient was given 6.8 mg. and one normal subject 7.1 mg. without untoward effects. Headache and flushing were not more severe after large doses of histamine than after the usual single B.W. dose uncovered by antihistamine. The latter often induced drowsiness, which enabled the subjects to endure more readily a trying succession of secretion tests.

Results.—The weights of HCl secreted in 45 minutes in response to various doses of histamine have been plotted as ordinates on a graph, with the dose of histamine along the abscissa: in both

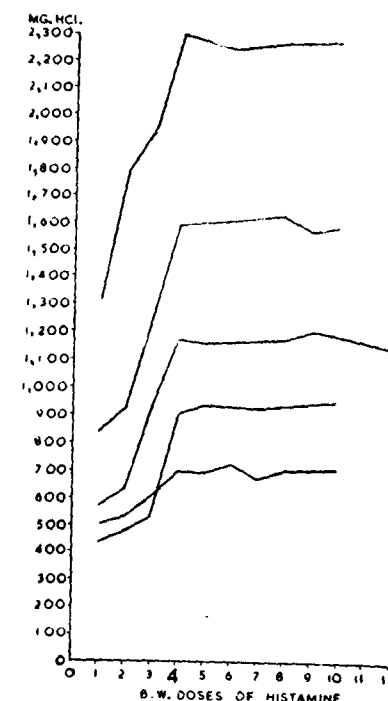


FIG. 1.—Dose-response curves in five cases of duodenal ulcer.

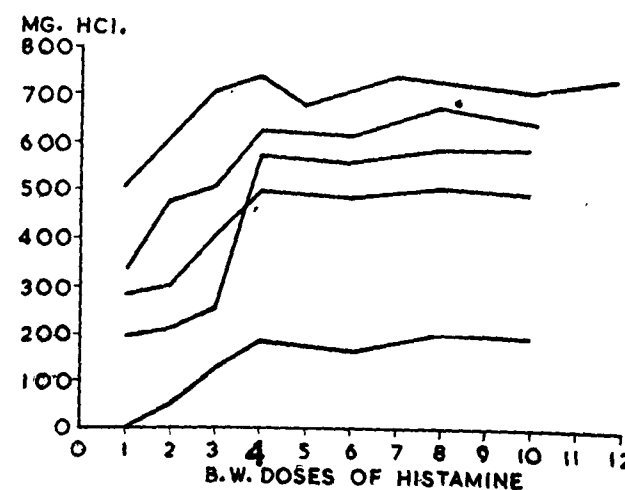


FIG. 2.—Dose-response curves in five normal subjects.

Duration of Maximum HCl Secretion after Four Body-weight Doses of Histamine

The following observations were made to determine the duration of the secretory response to large doses of histamine with a view to standardizing an augmented histamine test.

Eight male patients with duodenal ulcer were selected for study. Each patient was given a single test in which the subcutaneous administration of four B.W. doses of histamine was preceded by an intramuscular injection of 4 ml. of mepyramine. The juice was again collected by continu-

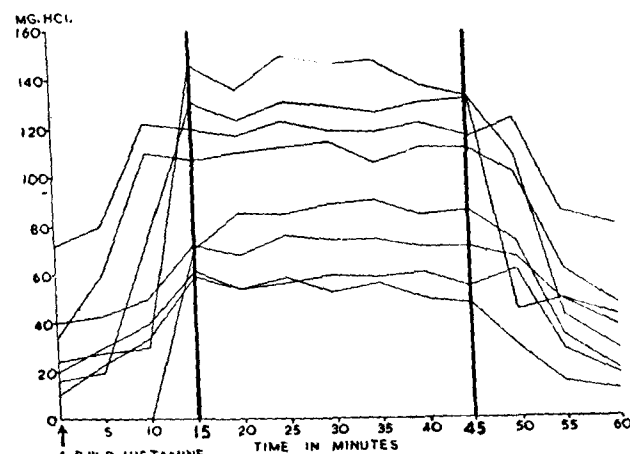


FIG. 3.—Gastric output of HCl (mg.) in response to four B.W. doses of histamine. Continuous aspiration—five-minute specimens from eight patients.

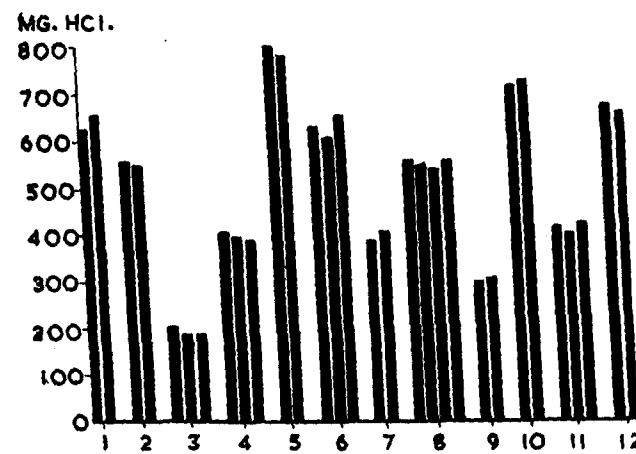


FIG. 4.—Gastric HCl output after histamine (four B.W. doses). Repeated estimations in 12 patients.

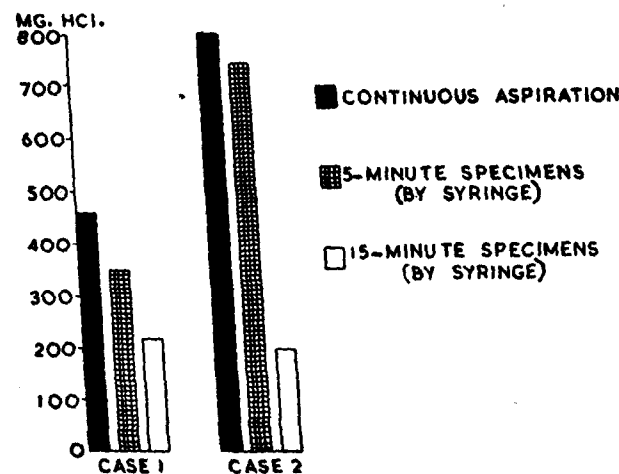


FIG. 5.—Gastric output after histamine (four B.W. doses).

ous suction, but the collecting vessel was changed every five minutes for a period of one hour. The weight of HCl secreted in each five-minute period was expressed in milligrams of HCl.

In all cases maximum output was reached in about 10-15 minutes and persisted for the next 30-35 minutes (Fig. 3). The best measure of output, therefore, is based on the secretion during the half-hour period from 15 to 45 minutes after administration of histamine.

Adopting this half-hour period of continuous aspiration, each of 12 patients was given two or more tests on successive days. The consistency of consecutive estimations is shown in Fig. 4. The error occurring between separate tests was about 5%.

That it is essential to collect the gastric juice by continuous aspiration has been shown by a simple experiment in which the histamine test was repeated on three successive days on each of two patients. The method of aspiration was the only variable factor in the three tests: continuous aspiration was used on the first day, syringe removal at five-minute intervals on the second day, and syringe removal at 15-minute intervals on the third day. It will be seen that the "maximum" HCl output of the stomach appears to fall when interval aspiration is employed (Fig. 5). This fall is due to the reduction in the volume of juice aspirated from the stomach, a considerable amount having been lost through the pylorus in the intervals between aspiration.

The Augmented Histamine Test

The test to be described is based on the conclusions reached in the foregoing studies. It provides two single results expressed in milligrams of HCl. The first figure indicates the basal secretion, and the second gives an expression of maximum parietal cell activity. The test is made as follows:

(1) The test is preceded by a 12-hour fast.

(2) A No. 9 stomach tube is introduced into the stomach and the fasting juice aspirated by means of a 50-ml. syringe. It is essential to alter the position both of the tube and of the patient until the tip of the tube reaches the most dependent part of the stomach and permits aspiration of the residual pool of fluid. This position of the tube is now maintained by fixing it to the side of the face and by insisting that the patient does not alter his posture until completion of the test. This will usually mean that he will lie comfortably on his left side.

(3) The spontaneously secreted gastric juice is now collected for a period of 45 minutes and the basal secretion expressed in milligrams of HCl produced in this time interval.

(4) 4 ml. of mepyramine is now given by intramuscular injection.

(5) The gastric juice is aspirated for the next 30 minutes and is discarded.

(6) A subcutaneous injection of a 4 B.W. dose of histamine acid phosphate is now made.

(7) The histamine-provoked secretion is continuously aspirated and the volume secreted in the half-hour from 15 to 45 minutes after injection is measured and its titratable free HCl estimated. The weight of HCl produced in this 30-minute period is the figure expressing the maximum parietal cell response.

This test of gastric secretion has certain advantages over other gastric-function tests. It is simple to do and lasts only two hours. The systemic effects following the administration of a large dose of histamine are prevented and the main subjective sensation is the drowsiness due to the anti-histamine. More than 200 such tests have now been made in this unit without incident. It provides two figures—one expressing basal secretion and one maximum secretion of HCl.

Analysis of Results of 148 Augmented Histamine Tests

The histamine test described, unlike other tests of gastric secretory function, has been shown to impose a maximum load on the secretory cells whose function it is designed to test. Furthermore, the consistency of consecutive estimations has been demonstrated. In an attempt to establish standards of normality for the test and note deviations from these

standards in patients with peptic ulcer, 148 subjects have been examined. This group comprises 25 normal subjects, 103 duodenal ulcer cases, and 20 patients with gastric ulcer. All were males. The normal group consisted of patients awaiting operation for hernia; in none was there a history of dyspepsia and none were febrile. The diagnosis in the ulcer patients was confirmed at operation in every case.

Results.—In the normal group the average basal output of HCl was 70 mg. and the average maximum output 422 mg.; in patients with duodenal ulcer the basal output averaged 265 mg. and the maximum output 837 mg.; in patients with gastric ulcer the means were 113 mg. and 478 mg. respectively. The occurrence of a wide variation on either side of these mean volumes is shown in the frequency distribution charts (Figs. 6 and 7).

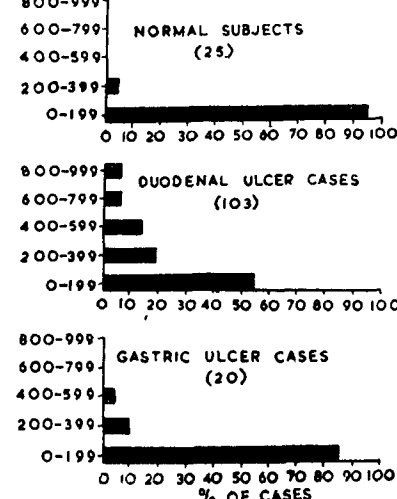


FIG. 6.—Frequency distribution of basal acid output (males).

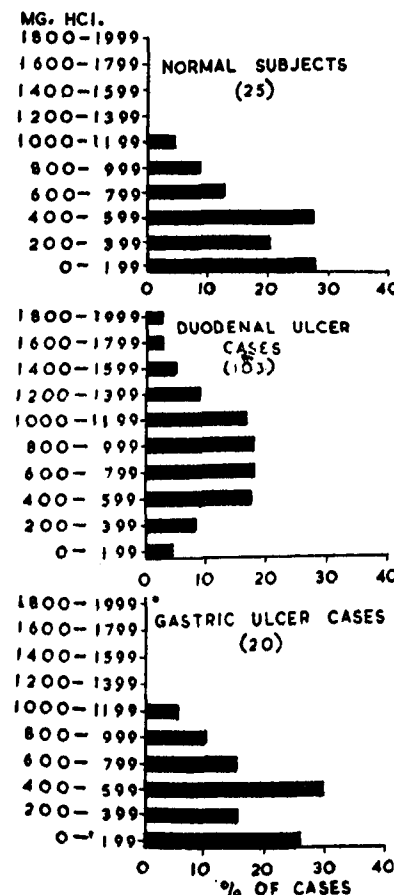


FIG. 7.—Frequency distribution of maximum acid output (males).

Three normal subjects and three gastric ulcer patients were found to have basal anacidity. All showed an acid response after histamine. The presence of stenosis did not appreciably influence either the basal or the maximum acid output in the duodenal ulcer group; a reduction in concentration was compensated by an increase in the volume of juice secreted, so that the actual amount of HCl produced was similar to that in the uncomplicated cases.

Discussion

The gastric secretory response to the commonly employed stimuli of food, alcohol, or small doses of histamine is known to vary greatly from day to day in any one individual. Indeed, the stomach has come to be regarded as capricious in its behaviour. That this is not so has been demonstrated by administering increasing doses of histamine: Four or more B.W. doses of histamine will result in an output of HCl which is constant for an individual and which represents the maximum parietal cell output of acid.

The usual interpretation of an S-shaped curve such as is shown in Figs. 1 and 2 is that the dose-response relationship is of an all-or-none nature. Therefore, with regard to the gastric secretion of HCl, this means that there is no secretion by a parietal cell until an effective stimulus is applied to it; then the parietal cell secretes maximally. The entire population of acid-secreting cells can be stimulated by giving four or more B.W. doses of histamine. Several investigators have attempted to make actual counts of the parietal cells in the gastric mucosa. As accurate counting necessitates detailed examination of the entire stomach, this method can rarely be applicable to human material. Furthermore, the visualization of a parietal cell under the microscope does not necessarily mean that it had been a functioning parietal cell. It would seem reasonable, however, to regard the maximum acid output of a stomach as an index of its parietal cell population.

The routine use of test meals is futile; in selected cases it is of value to determine the presence or absence of HCl. The failure of the stomach to yield gastric juice which was acid to Töpfer's reagent in response to a gruel meal was formerly taken to imply achlorhydria. Until recently, absence of free acid in response to histamine acid phosphate (0.1 mg. per 10 kg.) was regarded as a satisfactory criterion. Palmer and others have shown, however, that, although acid may be absent in several histamine tests, subsequent tests may reveal its presence. In short, the available tests, though satisfactory in most cases, cannot be relied upon to decide the presence or absence of complete achlorhydria. In several of a series of cases believed to have achlorhydria, as indicated by the ordinary histamine test, reinvestigation by the test described here has revealed an appreciable acid response. It should be emphasized that pH measurements should be employed in addition to titration methods if small changes in acidity are expected. The application of this test to cases of proved pernicious anaemia has regularly shown a true achlorhydria to be present. The advantages claimed for this augmented histamine test are that it imposes a uniform stimulus which exerts a full load on the acid-secreting cells, and that the results of the test are capable of repetition.

Although the test provides accurate data, its application, like that of all gastric secretory tests, is limited. No narrow standards of normal can be established, and it is consequently difficult to interpret the findings in disease. The observation that duodenal ulcer is associated with a higher range of acid output than normal is in agreement with the accepted work of Bloomfield (1932-3) and Pollard (1933). Similarly, the results of the present analysis, which show that the acid output in patients with gastric ulcer varies but little from the output in normal subjects, are not at variance with present beliefs. There is clearly no place for "hypoacidity" and "hyperacidity" as aids to diagnosis. Pernicious anaemia is the only common pathological condition having a characteristic secretory response.

Vanzant *et al.* (1932) found a considerable incidence of "unexplained anacidity" in a study of normal subjects, but not all of these were tested with histamine. Pollard (1933) quoted a 9.3% incidence of anacidity to histamine in normals. There were no cases of anacidity to large doses of histamine in the present study. Although the group was a small one, it seems likely that extensive use of the augmented histamine test will reveal a much lower incidence of this "unexplained anacidity."

As no true correlation can be shown between variations in output and pathological states, the main fields of usefulness for the augmented histamine would seem to be in physiological study, in certain anaemias, and in those rare and controversial cases in which peptic ulcer is claimed to exist in the presence of achlorhydria.

Summary

The effects of increasing doses of histamine on the gastric secretion of hydrochloric acid have been studied

in normal subjects and in patients with duodenal ulcer. The dosage required to effect maximum acid output has been established and the duration of this response determined.

An augmented histamine test of gastric secretion, based on these findings, is described.

This test, which imposes a uniform and maximum stimulus on the acid-secreting cells, gives consistent results on repeated estimations in any one individual.

An analysis has been made of the results of the test in 25 normal subjects, 103 duodenal ulcer cases, and 20 patients with gastric ulcer.

I am indebted to Professor C. F. W. Illingworth for his direction and helpful criticism throughout this investigation, to Mr. Gabriel Donald for preparing the charts, and to May and Baker Ltd. for presenting generous supplies of anthisan.

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AN ANTIHISTAMINE IN THE FENESTRATION OPERATION FOR OTOSCLEROSIS

BY

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AND

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As the window in a fenestration operation is made in the vestibular part of the bony labyrinth, signs of a vestibular disturbance are to be expected after the operation. Thus vertigo, with its associated nausea and vomiting, is a constant and sometimes troublesome early sequel, and plays an important part in determining the length of stay in hospital.

In a unit where the demand for beds is always greater than the number available, there is a constant stimulus to search for some means of increasing the rate of turnover of the beds. For some years now we have employed special head and balancing exercises to overcome the vertigo following operations on the labyrinth (Cawthorne, 1946; Cooksey, 1946), but even with these it was not possible to turn a fenestration bed over in less than two weeks.

Because of the immediate post-operative vestibular disturbance it was our practice to keep patients as comfortable and quiet as possible by means of twice-daily injections of soluble phenobarbitone. The disadvantage of this treatment was that the patients were made very drowsy; and vertigo was rarely sufficiently controlled for them to be fit to move to the gymnasium for exercises in under five days. We therefore started to search for a more effective means of controlling the vertigo without causing too much drowsiness, and this brings us to "avomine" (promethazine-8-chlorotheophyllinate). This contains one of the most active of the antihistaminic drugs, promethazine hydrochloride, combined with theophylline and in a form suitable for ambulant

patients. It was introduced primarily for the treatment of travel sickness, and its success in this condition suggested that it might help in our problem. Campbell (1949) has already reported on the value of another preparation, dimenhydrinate ("dramamine"), after the fenestration operation.

We first used avomine in our fenestration cases in July, 1951, and to date it has been given to nearly 300 patients. Treatment is started as soon as the patient is admitted to hospital, the day before operation. We have found that a dose of 50 mg. three times daily usually suffices, and this dosage is continued for two weeks after operation.

Results

The results of avomine therapy have been striking, and may be summarized as follows.

Post-operative Vomiting.—Formerly vomiting was often troublesome for two or three days after operation. Since the introduction of avomine vomiting is rare once the patient has recovered from the anaesthetic. With regard to the effect of the anaesthetic on the post-operative course, it has been found that the agents used rarely cause vomiting once the patient is fully conscious. The anaesthetics have been given by Dr. V. F. Hall and Dr. S. A. Mason; after pre-medication with "omnupon" and scopolamine, in half the cases intravenous thiopentone only was used, whilst in the other half this was supplemented with intravenous pethidine and gas-and-oxygen.

Diet.—Because of the vomiting patients rarely ate solid food for the first two or three days after operation. Now they welcome a light diet the day after operation and usually enjoy normal food the day after that.

Drowsiness.—Continued drowsiness caused by prolonged sedation with barbiturates no longer occurs.

Getting Up.—Formerly patients were reluctant to leave their beds within four days of operation, but now they get up on the second or third day.

Exercises.—The head and balancing exercises can now be started in bed the day after operation, and they go down to the gymnasium to join the class on the fourth day. Formerly they were reluctant to do this before the sixth or seventh day.

Walking.—Whereas patients were unable to walk steadily unaided for about ten days, they can do so now as a rule by the sixth day.

Discharge.—Patients are able to leave hospital on the seventh post-operative day, thus enabling a fenestration bed to be turned over each week.

Micturition.—It is not uncommon for patients to have difficulty with micturition following operations on the labyrinth. This complication has become much less frequent with avomine.

Since the introduction of avomine, and although four or five fenestrations are performed each week, not a single patient has had to be kept in hospital longer than seven days because vertigo was not sufficiently controlled. Perhaps the most convincing proof of its success is given by patients who have had a fenestration operation performed on each ear—one before and the other after we started using avomine. Almost without exception they have commented upon how much less disturbing they found the second compared with the first operation. So far we have not observed any unpleasant side-effects, and it has not been necessary to withdraw the drug in any case.

We would like to thank Messrs. May and Baker for providing the avomine used in some cases of this series.

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A HUMAN BLOOD-GROUP CHIMERA

BY

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Mrs. McK., a donor aged 25, gave her first pint of blood in March of this year. When the blood came to be grouped it seemed to be a mixture of A and O cells, for anti-A serum caused large agglutinates to appear to the naked eye, but the microscope showed these agglutinates to be set in a background of unagglutinated cells. The appearance was such as might be seen for a time after a large transfusion of O blood into an A recipient: but Mrs. McK. had never been transfused. Further samples excluded the possibility of any accidental mixing of bloods.

The evident mixture of blood called to mind the work of Owen (1945) on "immunogenetic consequences of vascular anastomoses between bovine twins." Anastomoses are usually present between bovine twin embryos; primordial red cells belonging to one twin take root in the other twin and continue throughout the life of that animal, to produce red cells with genetically foreign antigens. Chorionic vascular anastomosis and transfer of endocrine secretions between bovine twins of different sex had been postulated as the cause of the freemartin condition by Lillie as early as 1916.

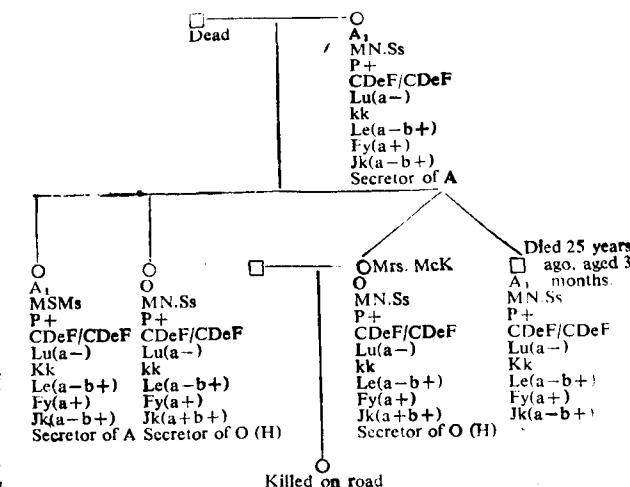
When asked if she were a twin, Mrs. McK., somewhat surprised, answered that her twin brother had died 25 years ago at the age of 3 months. The cause of death was said to be pneumonia complicating a strangulated inguinal hernia.

The O and A₁ cells in the blood of Mrs. McK. can be separated. The result of grouping the two components is shown in the pedigree; the O cells are kk, Jk (a+b+), the A₁ cells are Kk, Jk (a-b+): in their other groups they do not differ. There is no doubt that the true genetic blood of Mrs. McK. are those shown under her name in groups of Mrs. McK. This is established by the fact that she secretes O (H) antigen in her saliva but does not secrete A antigen. Since the red cells of her twin are A₁, Le(a-b+) antigen. It is strange that we should be able to group completely this twin 25 years after his death.

Miss Marie Cutbush, of the Medical Research Council Blood Transfusion Research Unit, has counted the relative numbers of the two kinds of red cells: 61% are Group O (σ=1.7%), which does not differ significantly from the count made by Miss Cutbush one month earlier.

Mrs. McK. is the first human being to be shown to have a double set of blood groups, and there can be little doubt that one set is the consequence of vascular communication with her twin. Though we have been prepared for this discovery by the work of Owen on bovine twins, such a mixture of blood cannot be common in human twins: the Blood Group Research Unit has tested the blood of 58 pairs of dissimilar twins and 82 pairs of apparently identical twins without finding any evidence of mixed blood groups.

Alternative explanations have been considered: somatic mutation is excluded because three separate genes are involved, and dispermia is highly improbable, for Mrs. McK. shows no obvious sign of asymmetry. None of the blood samples from the other surviving members of the family was in any way unusual.



The blood groups of Mrs. McK. and of her family. The groups shown under Mrs. McK. are those which she inherited and about 61% of her red cells are stamped with these groups. About 39% of her red cells are of the groups shown under her twin brother. The antisera used to group the family and the two components of Mrs. McK.'s blood were: anti-A-A₁-B₁-O₁-H, anti-M-N-S-s, anti-P, anti-C-c-Cw-D-E-e-f, anti-Lua, anti-K-k, anti-Le-a-Leb, anti-Fy^a, anti-Jka-Jkb.

Apart from its general interest the case of Mrs. McK. has particular implications:

(a) The early presence of A antigen has presumably inhibited the production of anti-A. Mrs. McK. is group O and her serum contains anti-B, but there is no detectable anti-A: it has been looked for by methods using saline, albumin, anti-human globulin, trypsin, and papain. If anti-A were being produced by Mrs. McK. and promptly adsorbed, the only tissue capable of such adsorption would be her A₁ cells, but these cannot be shown to be either sensitized or blocked.

(b) Secretion of A antigen in saliva clearly must depend on the presence in the genotype of the A gene as well as the secretor gene, for the secretor gene of Mrs. McK. cannot command the secretion of A present only in her circulation.

(c) Mrs. McK. is feminine in appearance and has had one child: she is clearly not a freemartin. Nevertheless, now that it is established that there can be prenatal communication between the circulations of dissimilar human twins, it may be worth recording the proportion of twins among people suffering from infertility and from abnormal sexual development.

In 1916 Lillie wrote: "In the case of the free-martin, nature has performed an experiment of surpassing interest." No doubt the same could be said of Nature's experiment on Mrs. McK. were we able to appreciate more of its implications.

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The World Health Organization Area Representatives Conference held recently in Delhi approved a proposal that W.H.O. should assist the Ceylon Government to initiate a postgraduate course for nurses in administration and training at the Colombo Nurses Training School: at present, nurses from Ceylon are sent abroad for postgraduate training. The Area Representatives Conference also agreed to the provision of a principal and three nursing tutors for a nurses' training school to be established at Galle or Jaffna in Ceylon. W.H.O. will also give Ceylon help in controlling tuberculosis, venereal diseases, and leprosy.

Reviews

TREATMENT OF POISONING

The Symptoms and Treatment of Acute Poisoning. By Professor G. H. W. Lucas. (Pp. 320. £1 7s. 6d.) London: H. K. Lewis and Co. 1953.

The danger of accidental, suicidal, or homicidal poisoning by the older galenic drugs or by certain species of plants, which has been a perpetual source of interest for hundreds of years, has nowadays been increased by the introduction of numerous potent new remedies into therapeutics, by the widespread use of agents to destroy pests of all kinds, and by the use of toxic substances in industry. It is fortunate that the treatment of poisoning is now more effective than it used to be. This little book provides concise and up-to-date information on the symptoms and treatment of acute poisoning by most of the agents likely to be encountered in medical practice. It is entirely concerned with the results of overdosage and not with the side-effects of drugs given in therapeutic quantities or with reactions arising as the result of idiosyncrasy in the patient.

Children are particularly liable to accidental poisoning owing to their singular propensity to investigate with their mouths substances which excite their curiosity. This danger is increased by the modern tendency of pharmaceutical firms to market their tablets and capsules in attractive and vivid colours and to temper their elixirs with the most fascinating flavours. In consequence a chapter of the book is devoted to the management of poisoning in children. A table is provided giving domestic equivalents for solid and liquid antidotes which may have to be measured out quickly in an emergency, and another showing for many poisons the least fatal dose recorded in the literature and the largest dose from which patients have recovered—information which may prove valuable to a doctor under cross-examination in a court of law. A complete index with adequate cross-references enables the reader to locate quickly the desired information. The book tells the doctor in short, sharp sentences, mostly in the imperative mood, what to do in an emergency and does not cloud the issue by stopping to reason why. The advice is usually scientifically sound, and it is a comfort to read in a work on poisoning that the skilful use of the stomach tube has largely superseded emetics. The book can be confidently recommended to general practitioners.

D. M. DUNLOP.

CHILDREN'S DISEASES

Fanconi and Wallgren's Textbook of Paediatrics. Edited by W. R. F. Collis, M.D., F.R.C.P., F.R.C.P.I., D.P.H. Translator and Co-editor E. Kawerau, M.B., M.Sc., A.R.I.C. (Pp. 1,104; 440 figures. £7 7s. 2d.) London: William Heinemann. 1952.

This book first appeared as Fanconi and Wallgren's *Lehrbuch der Pädiatrie*, and Dr. W. R. F. Collis, with the assistance of Dr. Kawerau as translator and co-editor, has been responsible for the new edition in English. The opportunity has been taken of making revisions in the original text, and a new section on megacolon by Dr. M. Bodian has been added. The numerous authors are all highly distinguished paediatricians, and their book is a considerable volume of some 1,100 pages, with over 400 illustrations, most of which are of high standard; the coloured plates are wonderfully good.

The book is planned on the usual textbook lines, system by system. Separate chapters are devoted to certain diseases and to particular aspects of paediatrics—for instance, tuberculosis, juvenile rheumatism, syphilis, and nutrition. The authors have been allowed a good deal of latitude, and they have responded by giving their personal views; this always makes for interesting and stimulating reading. The book is likely to be more suited to the hospital paediatrician than to the general practitioner, who is helped by stronger

emphasis on the early symptoms and signs of disease and by fuller reference to the scope of prophylaxis. The chapter on the disorders of puberty and adolescence—a subject that often receives scanty notice in textbooks—is an exception to the above comment, and is to be warmly welcomed.

The reader who is accustomed to the English textbooks will find some charts and tables that present facts in a new and stimulating fashion. But he will also find many mistakes in spelling and punctuation, and some paragraphs that appear to have defeated the skill of an earnest and competent translator. Doubtless these errors will be corrected in the next edition, and the work should prove to be a valuable addition to paediatric libraries.

N. B. CAPON.

ACUTE RENAL FAILURE

Acute Renal Failure: Including the Use of the Artificial Kidney. By John T. MacLean, M.D., F.R.C.S.(C.), F.A.C.S. (Pp. 114; illustrated. £2 7s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

There is much useful information in this little book, though none of it is new. Modern views on the causes, pathology, and treatment of acute renal failure are adequately presented and evaluated, though so outstanding an example of the condition as cortical necrosis of the kidneys would seem to have been overlooked. Prognosis also could have been discussed more fully. The description of the uses, application, and limitations of the various forms of the artificial kidney and other methods of dialysis is excellent, and the author's warning of the inadequacy of rigidly standardized solutions for perfusion therapy is important and timely.

The book is well written, contains many informative case records, tables, graphs, and illustrations, including five coloured plates, and concludes with an adequate subject index. The production is admirable, and the book can be recommended as a useful introduction to the subject.

A. A. OSMAN.

PSYCHOSOMATIC MEDICINE

Psychosomatic Medicine: Its Principles and Applications. By Professor Franz Alexander, M.D. (Pp. 300. £1 1s.) London: George Allen and Unwin. 1952.

The author of this book is the director of the Chicago Institute for Psycho-analysis, the first such institute with funds adequate for the necessarily prolonged research combining psycho-analytic and physiological observations on patients presenting combined psychiatric and medical problems. He has written and collaborated in writing many other more specialized books, but this volume should make a general appeal to senior medical students and general practitioners as well as young psychiatrists and specialists in the fields covered. The basic postulate of the author's approach is "that the psychological factors influencing physiological processes must be subjected to the same detailed and careful scrutiny as is customary in the study of physiological processes. Reference to emotions in such general terms as anxiety, tension, emotional imbalance is outdated. . . . Only such studies are included in this book as are carried out in accordance with this principle." The bibliography of 260 references is mostly to recent publications.

The first third of the book is a concise, clear exposition of the present American marriage of the detailed psychopathological principles of the pupils of Freud and the multi-dimensional approach of the pupils of Adolf Meyer. The remainder of the work is on gastro-intestinal disturbances (anorexia, bulimia, vomiting, cardiospasm, peptic ulcer, chronic diarrhoea, spastic and mucous colitis, ulcerative colitis), respiratory, cardiovascular, skin, metabolic and endocrinal, and joint and skeletal muscular disturbances. In a final chapter Benedek discusses male and female disorders in accordance with the principles outlined above. Many excellent half-page histories of psycho-analytic treatment or of psychiatric treatment by psycho-analytically

trained psychiatrists are included. The reasons for and the difficulties of co-operation between psychiatrists and physicians are clearly stated.

This book reads easily and is brief when compared with the material psychiatrists usually write. The psychiatric concepts should be understood by all physicians as easily as the medical student will understand the physiological concepts. What is hidden perhaps is that, whereas both psychiatrists and physicians take for granted the judgment and experience necessary to make use of the physiological principles, physicians have more difficulty in recognizing the need for psycho-analytic training taken by the psychiatrists whose basic studies have made this book possible. One can only hope it will be read as much in preparation for medical examinations as it surely will be for psychiatric. The nearest comparable book is Stanley Cobb's popular *Foundations of Neuropsychiatry*, first published in 1936.

W. CLIFFORD M. SCOTT.

CARDIOGRAPHY IN GENERAL PRACTICE

Cardiography in General Practice: Electrocardiography, Vectorcardiography, and Ballistocardiography. By Abraham I. Schaffer, M.D. (Pp. 136; 55 illustrations. £1 4s.) London: Baillière, Tindall and Cox. 1952.

The author of this book seems to aim at giving general practitioners a modern account of electrocardiograms based on a simple exposition of the physiological facts, and he succeeds very well indeed. It is remarkable how much information is compressed into a small space. The expression throughout is clear and concise, and there is no taking refuge in pseudo-scientific jargon. The result is that as a rule it is easy to follow the reasoning. At times perhaps the author is didactic; at times the exposition is too brief for anyone starting to learn the subject. On page 66 it is not made clear how to distinguish the minor variations seen in the cardiogram on exercise and acceleration from those of pathological significance. The Q wave which appears over an infarct is said to be due to a vector pointing from the contact. The idea of a "window" in the wall of the ventricle is not mentioned. It is not easy to see how the vector can distinguish between infarcts on the posterior wall of the ventricle from those of the diaphragmatic surface (p. 109). But the chapter on vectorcardiography is made clear and simple and well worth reading. There is no doubt that the idea of interpretation by vectors would not deter the beginner, who will soon find that "new presbyter is but old priest writ large." The diagrams are simple. There is also a chapter on ballistocardiography. This is a good little book and one deserving, and needing, very careful study.

TERENCE EAST.

EARLY DIAGNOSIS OF CANCER

Fundamentals of Clinical Cancer: With Emphasis on Early Diagnosis and Treatment. By Leonard B. Goldman, M.D. (Pp. 312. 221 figures. \$8.75.) New York: Grune and Stratton. 1953.

This book is intended for all who diagnose and treat cancer. Its aim is to make practitioners cancer-conscious so that they suspect the disease in its early stages, and to show how the diagnosis may be confirmed and what treatment should be given.

Some of the author's views differ from those usually held in Britain. Facing page 1 are 10 commandments of cancer control. Many readers here will disagree with the first—"Circumcise at birth to prevent cancer of the penis, and to reduce the incidence of cancer of the cervix and cancer of the prostate"—and the last—"Do not operate on tumours which cause continuous pain except bone tumours." Some operable cancers cause continuous pain, and most non-malignant painful tumours require drainage or removal. The malignant painful tumours require drainage or removal. The author lays great stress on biopsy; the methods of localized removal by scissors and by punch illustrated in Figs. 1 and 2 would be anathema to most British surgeons and pathologists.

Other statements to which exception may be taken are that "early cancers may be removed by simple surgery, invasive cancers should be eradicated by radical surgery," that "squamous cell cancers on the skin of the face rarely metastasize," and "every enlargement of the testicle should be biopsied by removal of the testicle." The view that "70% of lung cancers can be seen through the bronchoscope" is unduly optimistic, but the assertion that "occasionally cancer of the lung can be removed by radical surgery" is quite unjustifiably gloomy. About 20% of lung cancers can be resected, and a quarter of the patients thus treated are alive five years later.

Apart from these minor criticisms, the book is excellent. It will not interest the specialist surgeon or the radiologist, for treatment is not discussed in any great detail, but it should be of considerable help to general practitioners. The common types of cancer in each region are described. Methods of diagnosis and differential diagnosis are given, as well as the different methods of treatment available, with advice on which is most suitable. The illustrations, which are numerous, well chosen, and well reproduced, are an admirable feature.

HENEAGE OGILVIE.

GYNAECOLOGICAL PATHOLOGY

Gynecological and Obstetrical Pathology. By Professor Peter A. Herbut, M.D. (Pp. 683; 428 illustrations on 246 figures and two coloured plates. £4 13s. 6d.) London: Henry Kimpton. 1953.

The size and title of this book raise hopes that it is the one for which all gynaecologists and pathologists have been waiting. Unfortunately its title is rather deceptive in that its size is explained not by an abundance of pathology but by an attempt to cover every condition from every approach—its incidence, cause, clinical features, complications, diagnosis, and even treatment and prognosis. The only real justification for including obstetrics in its title is a chapter on diseases of the placenta and membranes, a chapter notable for the statement that "infarcts of the placenta, even when massive, are of little clinical significance."

The discussion of clinical aspects by a laboratory worker must almost inevitably be based on reading and hearsay rather than on experience, and here the reader gets the same impression of the sections on morbid anatomy and histology. Instead of giving his own views and observations Dr. Herbut is content to treat most subjects by giving a précis of some article which has appeared in the medical press at some time during the last ten years. The review of the literature, confined almost entirely to journals published in the U.S.A., is incomplete and could be positively misleading. For example, the author states that he can find only two recorded cases of air embolism resulting from vaginal insufflation, whereas references to four such cases were given in the *British Medical Journal* as long ago as 1945, and there has been at least one other published since. Again, can we really believe that only 28 cases of female pseudohermaphroditism had been described by 1942?

In a wide coverage of the field some account is given of many rare and bizarre conditions whose description is not easy to find elsewhere, and this is the most useful feature of the book. Unfortunately, one's confidence in it as a work of reference to the rarities is shaken by the many errors and discrepancies which are to be found in regard to the conditions on which one has some prior knowledge. The statement that the cause of uterine fibroids is now known is as startling as it is untrue. Erosion of the cervix—a fascinating problem for pathologists—is mentioned only once, to be dismissed as synonymous with ectropion. Fig. 114 is upside down. Fig. 175 is alleged to show a serous cystadenoma of the ovary, whereas the arrangement of the blood vessels in its wall shows clearly that it is an extraperitoneal cyst—probably fimbrial or parovarian in type. Ovarian agenesis is said to represent a failure in the development of the part of Mullerian duct which gives rise to the ovary. The book is a queer mixture and, on the whole, disappointing.

T. N. A. JEFFCOATE.

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THE ARTIFICIAL HEART

Research into the creation of an artificial circulation has been going on since 1937, when Gibbon¹ reported the use of a heart-lung apparatus to maintain the circulation during experimental occlusion of the pulmonary artery. Dr. D. G. Melrose and his colleagues have now brought such an apparatus to a high degree of perfection, and their results are published in our opening pages this week. The design of their machine is based on that of the pump-oxygenator described by Björk² and Crafoord.³ The oxygenator is a rotating cylinder set at an angle to the horizontal and containing annular perspex plates. The blood travels through it under the influence of gravity and is spread over the plates. These are arranged so that the greatest possible surface area of blood is exposed to the oxygen pumped into the cylinder. Two valveless rotary type pumps, driven by electric motors, are used: these are a venous pump to supply the oxygenator with blood, and an arterial pump to deliver the oxygenated blood to the subject. Three manometers measure, respectively, the volume of blood in the oxygenator, the pressure in the venous part of the artificial circuit, and the pressure in the arterial part of the artificial circuit. The speed of the pumps is controlled electrically by signals from the manometers, thus ensuring that they work in harmony to maintain blood volume and arterial pressure; excessive venous suction is thus prevented. This mechanism is capable of maintaining the blood volume within 50 ml. over a range of flow of between 300 ml. and 3 litres per minute. The oxygenator is kept at a constant temperature, and oxygen is delivered through an adjustable rotameter which permits of adjustments of rate of flow. The acid-base balance is controlled by altering the rate of flow of oxygen or by the addition of small amounts of carbon dioxide. The gases are passed through a warming, filtering, and humidifying system.

In the second paper published in this issue Melrose and his colleagues describe the results in thirty anaesthetized dogs of using the heart-lung machine in parallel with the normal circulation, blood being fed into the machine from the femoral vein and returned

to the animal via an artery. Careful studies have been made of cardiac output, central venous pressure, systemic blood pressure, and cardiac rate and rhythm, as well as investigations into the effect of the oxygenator on the cellular and chemical constituents of the blood. In order to prevent coagulation in the oxygenator the animals were heparinized initially, and then given protamine sulphate to neutralize the heparin at the end of the experiment. Most of the experiments lasted one hour, the rate of perfusion being 750-1,000 ml. per minute. No dog died as a direct result of the perfusion, although for other reasons four did not survive the procedure. Two to three days later the surviving dogs were normally active and apparently had suffered no ill effects. Post-mortem examination of 25 dogs, which were sacrificed three months later, did not show any abnormalities.

The results obtained are of great interest, and there can be no doubt of the efficiency of the machine as an oxygenator: for instance, in one dog 150 c.cm. of oxygen was introduced into the circulation per minute. When dogs were made anoxic by reducing the content of oxygen in the inspired air the arterial oxygen rose significantly in the region where the oxygenated blood was returned from the machine, but remained depressed in other areas. Thus, when the blood was returned to the femoral artery, the cephalic end of the animal remained anoxic, while the oxygen content of the arterial blood in the caudal end increased. Cardiac output determinations on twelve dogs showed that the output fell in nine and rose only in two. In some dogs the fall was of the order of 30%, although the authors point out that considerable difficulty attended the accurate estimation of the output under the conditions of the experiment. No arrhythmias occurred, and there were no significant alterations in heart rate, mean arterial pressure, or central venous pressure. The formed elements of the blood changed in several ways, the most striking being a fall in leucocytes of nearly 50%, mainly the granular series. The numbers of platelets and red blood cells fell also, but to a less extent. The plasma haemoglobin rose, and the haematocrit fell, indicating haemolysis and haemodilution, which were considered to be due in part to the dextran solution used to charge the oxygenator. Cleaning and sterilization of the apparatus was carried out chemically by detergents and 3% formalin, but sterilization by autoclaving should soon be possible.

¹ *Arch. Surg. (Chicago)*, 1937, 34, 1105.

² *Acta chir. scand.*, 1948, 88, Suppl. 137.

³ *Surg. Gynec. Obstet.*, 1949, 88, 629.

⁴ Helmsworth, J. A., et al., *J. thorac. Surg.*, 1952, 24, 117.

⁵ *J. Amer. med. Ass.*, 1952, 150, 451.

⁶ Davies, C. E., and Mackinnon, J., *Lancet*, 1949, 2, 883.

⁷ *J. thorac. Surg.*, 1952, 24, 134.

⁸ *J. Amer. med. Ass.*, 1952, 150, 642.

⁹ Melrose, D. G., and Wilson, A. O., *Lancet*, 1953, 1, 1266.

ally by detergents and 3% formalin, but sterilization by autoclaving should soon be possible.

Melrose and his colleagues consider, and with justification, that their apparatus might now be applied to the treatment of certain forms of cardio-respiratory failure in man, the oxygenator being used in parallel with the normal circulation. Clearly the step from experiment on the animal to treatment of the human is a big one, and careful thought will have to be given to the type of patient likely to benefit from the artificial heart, and to the problems which may arise. The indications for its use would include any form of acute, potentially reversible anoxia which does not respond to the usual forms of treatment—for instance, acute cor pulmonale, severe congestive cardiac failure, or acute circulatory failure such as may follow cardiac infarction. The oxygenator would also be of great value to the cardiac surgeon to augment the function of the heart during long and difficult operations for the relief of cyanotic congenital heart disease, but heparinization of the patient, which is apparently essential for the working of the oxygenator, would present a formidable problem to the surgeon. Although the coagulation time can be rapidly restored to normal after operation by the injection of protamine sulphate, this may apparently result in acute arterial hypotension.⁴ Disadvantages of the oxygenator at present are the difficulties of complete sterilization (with the possibility of introducing pyrogenic or other toxic material into the recipient), the profound fall in circulating white blood cells, haemolysis, and a possible fall in cardiac output. The most important of these are likely to be the reduction in white blood cells and in cardiac output, though the former may prove to be less of a disadvantage than is at first apparent, since the number of white blood cells apparently rapidly returns to normal at the conclusion of the treatment, and may later exceed the original level. Moreover, there was no leucopenia after the use of a pump-oxygenator in man by Helmsworth and his colleagues.⁵ Cardiac output is unlikely to fall by more than the output of the machine, but any further reduction in output might be undesirable in an acutely anoxic patient, even though the arterial oxygen saturation was increased.

In heart failure due to chronic bronchitis and emphysema, the respiratory centre may respond only to a low arterial oxygen saturation. In some cases coma and neurological abnormalities have been induced by oxygen administration.⁶ If the oxygenator is applied to such patients, measures will have to be taken to ensure adequate pulmonary ventilation

and carbon dioxide elimination, and some form of assisted respiration should be at hand. The vein-to-vein, rather than the vein-to-artery, route would appear to be preferable for perfusion, in view of the difficulties and potential hazards of intra-arterial transfusion.⁹ Helmsworth and his colleagues⁵ used a similar machine to treat a patient with cor pulmonale, drawing blood from the inferior vena cava via a catheter in one saphenous vein and returning it to the other, the arterial oxygen saturation being raised from 43% to 58-65%. No ill effects resulted from the use of the machine, but improvement was not maintained after withdrawal of the artificial circulation.

Professor Ian Aird, in his foreword to Melrose's first paper, wisely suggests that the use of an oxygenator to replace the heart during cardiac surgery may not yet be immediately attainable. Certainly the most formidable difficulties have been encountered by other workers when the whole heart has been excluded from the circulation, such as air embolism or haemorrhage when the venous end of the pump is attached to the right auricle, and acute arterial hypotension and bradycardia when the right auricle is emptied.⁷ But Dodrill and colleagues⁷ have reported the absence of such hypotensive reflexes from the left auricle, and have succeeded in isolating the left side of the heart in animals by removing blood from a pulmonary vein and returning it to the aorta through a cannula in the subclavian artery. By this means they were able to expose the mitral valve for 20-30 minutes, with subsequent survival. They were also able successfully to by-pass the left ventricle in a patient with mitral-valve disease for 50 minutes, maintaining the artificial circulation at a rate of 4½ litres per minute.⁸ If this technique (which, incidentally, does not require the oxygenator) should prove generally applicable, the surgery of mitral incompetence and aortic valve disease would be greatly assisted.

Whatever the future applications of the artificial heart, Melrose and his colleagues are to be highly commended for their ingenuity and resource. The vital step of applying the machine in treatment has presumably still to be taken. The circumstances justifying a trial at the present time are few, but the potentialities of the machine may be considerable. A glimpse of the uses to which a similar machine has been put in the treatment of a desperately ill patient has already been given by Helmsworth *et al.*⁷ We can feel assured that this machine will be used wisely and humanely, and it is likely to be a valuable contribution to the advancement of cardiac surgery.

FLUORIDATION OF WATER

For many years it has been observed that the presence of fluorine in drinking water affects the structure of the teeth to a greater or less extent according to the quantity present. McKay reported¹ in the United States in 1929 that the incidence of dental caries was reduced in a district where there was a high concentration of fluorine in the water supply. In consequence a number of field surveys were carried out, and by 1942 it was established that dental caries is less in the groups of individuals who drink water containing fluorine during the period of tooth formation. This has since been confirmed by reports from many other countries, including Great Britain.

United States research workers decided to ascertain whether a similar beneficial effect followed the addition of enough fluorine-containing compound to a fluorine-deficient water supply. The concentration of 1 p.p.m. of fluorine was selected as giving considerable protection against dental caries without mottling of enamel. The first of six projects was started in 1945 at Grand Rapids, Michigan. But more recently fluoridation of drinking waters has been adopted in many communities in the United States purely as a public health measure.

In Britain the Medical Research Council, in a report to the Minister of Health, recommended that a small mission should study the fluoridation of water supplies, and one was therefore sent to the U.S.A. to study the schemes there at first hand. Its 100-page report has just been published.²

The mission considers the evidence is conclusive that a reduction in the incidence of dental caries is obtained comparable to that experienced when fluorine occurs naturally in the water. However, since the schemes have been in operation for only seven years, data relating to individuals over the age of 6 years are not yet available. But there is nothing to suggest that water containing naturally occurring fluorine has properties different from those of water to which fluorine has been added.

The possible hazards of adding fluorine have been carefully considered. The risk of producing mottled enamel at the level of 1 p.p.m. is extremely small. Only an occasional white fleck on the enamel occurs, which is so slight that it can be recognized only with experience. No sound evidence was found that there is danger to health from the continuous consumption of water containing fluorine in low concentration. Mortality statistics did not indicate any hazard, and according to local medical opinion there was no

increase in morbidity. The mission concludes that "the proving of a negative is extremely difficult. Meanwhile we are impressed by the fact that millions of people are living in ordinary good health on waters containing fluorine at levels of 1 p.p.m. or more."

It may give rise to some surprise that in the United States, "where by 1951 fluoridation of water supplies had become a fairly common practice," a Select Committee of the House of Representatives conducted a public inquiry into the safety and efficacy of fluoridation and concluded "that a sufficient number of unanswered questions concerning the safety of this program exists to warrant a conservative attitude." This conservative attitude is mirrored in the mission's recommendations. It advises in the first instance the addition of fluorides to water supplies of some selected communities which should be regarded as study centres to observe the effectiveness of the procedure under our own particular conditions of diet and caries experience. Research should also be carried out in areas where fluorine occurs naturally and in higher concentrations than that suggested for artificial addition, where the general health could be studied and investigations carried out into bone development and disease, and diseases of the kidney in particular, so that no question remains unanswered.

The amount of reduction in dental caries caused by the presence of fluorine in the drinking water should be viewed in perspective. Comparative studies show that much the greatest change in the incidence of dental caries is associated with alteration of diet. Even the reduction in dental caries experienced by many communities under wartime conditions was greater than could be expected from drinking fluorine-containing water. And the increase in dental caries observed since the war, an increase that seems to be continuing even now, would scarcely be reversed by the fluoridation of drinking water. Even so, such preventive measures as topical applications to the teeth are far less effective. Of the measures available, fluoridation of drinking water to a level that shows a decrease in caries without discoloration of the teeth would seem to be a most useful procedure. Although not every child would necessarily benefit from it, since the water intake might be below average, the greatest benefit to the greatest number of children would result, and its effect would last well into adult life. But in spite of this preventive measure dental caries will be a common disease and nearly everyone will need to have carious teeth treated annually.

Such a measure as fluoridation of public water supplies, entailing the treatment of a commodity consumed by almost everyone, is likely to be the centre of warm controversy.

emotions in which they have a vested interest, some politicians and publicists may try to divert public attention from the facts so far gathered. This report makes an informative and dispassionate contribution to the debate.

A HUMAN CHIMERA

The *chimaera* of classical tradition was a creature consisting of parts of several different vertebrate species. In the natural world individuals composed of two genetically distinct parts are rare. They are found in the plant kingdom and more rarely among insects. In their more obvious manifestations chimeras are unknown among mammals, but serology, more subtle than the unaided eye, has shown that they do exist in cattle. And now Mr. I. Dunsford and his colleagues, as they report in this week's *Journal* at p. 81, have demonstrated the existence of a composite human being.

It has long been known that when cattle twins are of unlike sex the female is usually sterile, and Lillie¹ showed that this was associated with an anastomosis between the chorionic circulations. In the freemartin or imperfect female twin the abnormal genitalia are cytologically female and are the consequence of a transfer of hormones, not of cellular material, from the blood stream of one individual to the other. Owen² was the first to show that a cellular transfer can indeed take place. He demonstrated that in non-identical cattle twins, whatever their sex, there is a double set of red blood cells, one set corresponding in its blood-group antigens to the genetical constitution of the individual carrying them, and the other set to the constitution of the twin. To account for this it must be assumed that viable erythroblasts traverse the chorionic anastomosis in each direction, and become implanted in the bone marrow of the opposite twin. Vascular anastomoses between dizygotic twins and abnormalities in the genitalia of twins of unlike sex do not appear to have been described in man, nor have mixed blood groups hitherto been observed in human twins.

The chimera described this week by Dunsford and his colleagues is a woman with a mixture of A and O red cells. She is the survivor of a twin pair. The two sets of cells are distinct genetically, differing in two other antigens as well as those of the ABO system. The authors consider a number of possible explanations and show that almost certainly the case is the result of an antenatal implantation of erythroblasts from the twin, as already described in cattle.

The research described opens up an interesting but limited field of investigation into the blood groups of twins, the anatomy of their foetal blood supply, and, though not present in this case, the possible occurrence in them of abnormalities of the genitalia. But there are some wider implications. The observations reveal a further example of the failure of the organism to become immunized to an antigen to which it has been exposed

in early foetal life. Another suspected example of this was recently discussed by Booth *et al.*³ But perhaps the most fundamental finding was that the genetical control of salivary secretion of the blood group substance does not operate through the red cell at any stage of the cell's existence. This may have a bearing on the recent discovery of a relation between blood groups and the incidence of carcinoma of the stomach⁴ and the suggested relation of this to secretion.⁵

UNIVERSITY GRANTS

Great changes have taken place in medical education since the war, according to the latest report of the University Grants Committee.¹ They were in response to the scientific revolution that is still in full spate in our profession and to the proposals of the Goodenough Committee made in 1944.² Since then fifty-five new full-time professorial chairs have been created, together with their staffs of readers and lecturers from whom future professors will be recruited. Postgraduate education has been greatly strengthened, notably in the British Postgraduate Medical Federation established by London University. And most of the teaching hospitals have greatly expanded their research programmes. Much the same story can be told of the other branches of science—though with one striking difference. Whereas the total student population rose from 50,000 to 83,000 between 1938-9 and 1951-2, the medical student population showed little change, being 12,000 in the earlier year and 14,000 in the later. So, with fifty-five new professorial chairs to contend with as well as an intern year, the students are likely to share the regret expressed in this report that "little appears to have been done to carry out the recommendations of the Goodenough Committee for a lightening of the medical curriculum." If teachers can ever bring themselves to lighten instead of to increase the load they think their charges ought to bear, some of them will have an opportunity of suggesting how it should best be done when they speak at the First World Conference on Medical Education to be held at B.M.A. House next month.³

If the methods and subjects taught have changed in the years reviewed, so too have the students. Though figures for financial assistance are not given separately for medical students, they probably do not differ much from those for all students, of whom 41% received assistance in 1938-9, 72% in 1951-2. But the quality of the students seems not to have altered much. The very clever have remained few, the really weak have not found places; consequently the proportion of good second-class students is higher than it used to be. Apart from that the report finds some evidence of a general improvement of student quality in medicine, attributing it to the fact that entrants come from a wider field than formerly. Inquiring into health services organized by the universities, the University Grants Committee found a strong demand for them from the students, who attached

¹ *Dent. Cosmos*, 1929, 71, 649.

² *The Fluoridation of Domestic Water Supplies in North America as a Means of Controlling Dental Caries*, 1953. H.M.S.O. 5s.

³ *Science*, 1916, 43, 611.

⁴ *Ibid.*, 1945, 102, 400.

⁵ *British Medical Journal*, 1953, 2, 41.

⁶ Aird, I., and Bentall, H., *ibid.*, 1953, 1, 799.

⁷ Sheppard, P. M., *ibid.*, 1953, 1, 1220.

¹ *University Development*, H.M.S.O. 3s. 6d.

² *British Medical Journal*, 1944, 2, 121.

³ For programme see *British Medical Journal*, July 4, p. 32.

much importance in particular to psychiatric advice being readily available. But, as the report points out, the coming of the N.H.S. must make universities think again about the expenditure of money on services of this kind lest they merely duplicate what is already provided.

The functions and powers of this committee, which make it unique in university administration, are discharged with such sagacity that not only is it the envy of universities in other countries but—a harder test—it continues to hold the respect of universities in Britain. Its members give abundant evidence of that love of learning whose advancement it is their task to help.

PLASMA EXPANDERS

The introduction of gum acacia solutions by Bayliss and other investigators for infusion into the wounded toward the end of the first world war saved many lives. During the second world war the Allies relied on blood and plasma infusions with notable success, but new plasma expanders were developed, mainly in Sweden and Germany, to help overcome difficulties in supplying sufficient quantities of blood and blood products. These difficulties are still present in many parts of the world, and in certain circumstances even Britain is apt to experience them in spite of the finest of transfusion services. The risks from plasma and blood transfusion have not all been overcome, notably that of plasma jaundice; others are probably still to be discovered. Progress in finding out the advantages and disadvantages of plasma expanders is therefore important.

Two modern plasma expanders are now available commercially—dextran and polyvinyl pyrrolidone. Their therapeutic value in retaining fluid within the circulatory system depends on their colloid osmotic pressure, which is a function of the number of their molecules not free to pass through the blood capillaries. These colloids are unfortunately not homogeneous in molecular size: they usually range from about 20,000 to 200,000 in molecular weight terms. These small and large molecules differ in their effects in the body, not only in degree but also in kind. Substances with molecular weights below about 25,000 are rapidly removed from the body by renal excretion through the glomeruli,¹ and they are virtually useless as plasma expanders,² since any effect obtained will be nearly as transient as if physiological saline had been administered. Material with high molecular weight has other disadvantages, especially evident because large concentrations are needed to produce colloid osmotic pressures equivalent to that of plasma (30–40 cm. of water). High molecular weight solutions are unduly viscous. They may form precipitates with plasma constituents, especially with fibrinogen³; they are deposited in the reticulo-endothelial system⁴; and they tend to aggregate red blood corpuscles, as shown by a raised erythrocyte sedimentation rate. These last two effects are probably more marked in solutions of equivalent molecular size with polyvinyl pyrrolidone than with dextran.

For use as plasma expanders, then, colloid solutions of intermediate molecular size are required—perhaps of the order of 70,000 to 100,000 for dextran, and somewhat smaller for polyvinyl pyrrolidone. Attention may also have to be directed to the molecular shape of the material. This varies in dextrans from different sources according to the nature of the linkages between its component glucose units. Medical men must choose the material to give their patients, and this implies manufacture to specification, as was adopted temporarily in the early clinical trials of dextran in Britain.⁵ Suitable specifications and legal control of the composition of plasma expanders are therefore required before they can be recommended unreservedly and full advantage taken of their sphere of usefulness. This does not (and cannot) include their substitution for blood in the treatment of severe haemorrhage or anaemia. More blood donors still are needed.

MEDICAL LIBRARIANS IN CONGRESS

London is unequalled for its wealth of medical libraries: some of the most important collections in the world are contained within a small area—the libraries of the Royal Colleges, of the Royal Society of Medicine, of the B.M.A., of the London School of Hygiene, and the Wellcome Foundation's famous historical collection. Appropriately, therefore, the First International Congress on Medical Librarianship is to be held in London, from July 20 to 25. Sir Cecil Wakeley, P.R.C.S., is the president of the Congress, and he will be supported by thirty-eight vice-presidents, representing the chief medical libraries of the world, universities, and other organizations. Exhibitions to be held in connexion with the Congress are of medical periodicals (in the Old Library of B.M.A. House), of medical books and equipment (in the Gymnasium of University College), of the U.S. Armed Forces Medical Library (in the auditorium of the Wellcome Research Institution), and of the history of medical libraries and of medical bibliography (in the Wellcome Historical Medical Museum).

Sir Cecil Wakeley, in a presidential message to the Congress, quotes Osler's warning that "to study the phenomena of disease without books is to sail an uncharted sea," and he aptly continues the simile by emphasizing the needs not only for charts but also for pilots, among which medical librarians can count themselves. Pilots, of course, should be carefully trained, and one of the subjects to be discussed at the Congress is the education and training for medical librarianship. At present Britain is the only country in which medical librarians qualify as such by special examinations. Two sessions of the Congress will be given up to a symposium on the role of the medical librarian in the world to-day.

Among the other subjects to be debated are international co-operation and aids to the current indexing of medical literature—a matter of topical importance, since the existing indexes are falling behindhand. By discussing their common problems at this Congress and by fostering the spirit of international co-operation, medical librarians will be increasing their already great contribution to the spread of scientific learning throughout the world.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

LEUCORRHOEA

BY

C. S. RUSSELL, M.D., F.R.C.S.Ed., M.R.C.O.G.

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Whiteness is not a common feature of the abnormal discharges from the vagina, and so the word "leucorrhoea" is being used less and less: it is being replaced by the more widely applicable phrase "vaginal discharge," which covers all varieties of discharge regardless of colour, though usually excluding those that are blood-stained. The symptom is common; it occurs at all ages and is of widely differing significance.

Bacteriology

A distinction must be drawn between the flora of the vulva and vestibule and that of the vagina. At birth the vulva and vestibule are usually sterile, but this state of affairs does not last long: within a few hours organisms reach the area. Their type depends largely on those present in the immediate environment; provided this is clean, pathogenic bacteria in harmful concentration will be absent.

During the mother's pregnancy the foetal vagina is under the influence of the maternal oestrogens, and at birth therefore its epithelium is well stratified and the cells contain glycogen. Within 12 to 24 hours of birth Döderlein's bacillus makes its appearance and remains for about two weeks, until the effect of the maternal oestrogen has worn off. This bacillus, assisted by enzyme activity, is thought to break down the glycogen in the vaginal cells into lactic and other acids in lesser amounts, which together have a powerful bactericidal action. By the end of the second week of life the vagina is probably once again sterile, and it normally remains so in infancy and childhood. Another factor in keeping the vagina free of pathogenic bacteria during this period may be the anatomical arrangement: the walls of the vagina are in close apposition and the introitus is so nearly closed by the hymen that the passage of harmful organisms upwards from the vulva is unlikely.

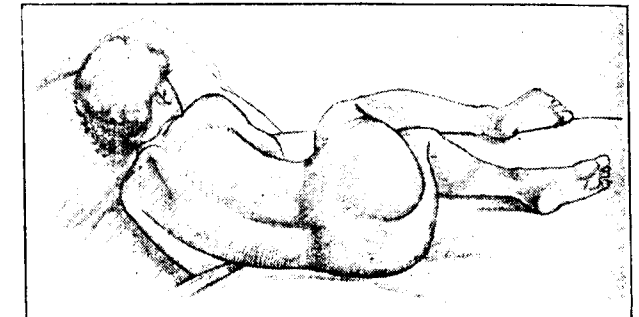
During the reproductive years of life the bacterial flora is mixed, and pathogenic bacteria may be present, particularly in the lower one-third of the vagina. But they should not survive long, being inhibited in their growth by the vaginal acidity (pH 4–5.5). It has been estimated that a concentration of lactic acid of 1% may be present during these years. The vaginal acidity, which is so important in maintaining vaginal health, is temporarily neutralized by the menstrual flow, and this accounts for the tendency of infections of the vagina to return or relapse after each period.

Examination of the Patient

From all patients complaining of vaginal discharge a careful history must first be taken to obtain as much information as possible about the time and mode of onset; its quantity, colour, and consistency; whether it is irritating, offensive, or blood-stained; and any other special features. Then examination should be carried out in a good light. After preliminary examination of the abdomen and any general examination that seems necessary, the patient should be made to lie comfortably on her back with her thighs drawn up and separated; the labia are then parted, and the vaginal introitus is examined for the presence of discharge, signs of inflammation, ulceration, or oedema or other swellings. The urethral orifice should be swabbed clean with saline; if there is any suggestion of urethritis the urethra should be gently "milked" downwards with

the finger on the anterior vaginal wall; if it is possible to express pus from the urethra a swab must be sent for bacteriological examination: pus can never be expressed from the urethra in a simple case of vaginitis; it always means that there is some other condition present. The patient should then be turned on her side with her thighs drawn up, the upper one slightly more so than the lower one (see Fig.), and a lubricated Sims speculum gently inserted into the vagina.

If a discharge is seen a specimen diluted with saline should be inspected under the microscope for trichomonas or the spores and hyphae of vaginal thrush. The discharge is then removed with a swab on sponge-holding forceps, and the vaginal walls are carefully inspected for redness, signs of abrasion, ulceration, or other abnormality. The



Position for examination with a Sims speculum. A lower pillow or even no pillow might be better.

cervix is next inspected for erosion and evidence of cervicitis, and any excess of cervical mucus noted. Sometimes it is helpful to turn the patient into the knee-chest position, because, with the Sims speculum in the vagina and the patient in this position, the vagina balloons out, and a very clear view of the vaginal walls may be obtained. Finally, an ordinary bimanual examination should be performed to exclude disease of the pelvic organs.

In most cases this examination will give as much information as is required to find out the cause of a vaginal discharge. If the findings are equivocal specialist opinion should be sought, as special culture methods may be necessary.

Vaginal Discharge before Puberty

Vaginal discharge before puberty is most commonly a sign of infection, seldom localized to the vagina, more usually taking the form of a vulvo-vaginitis: any of the pathogenic bacteria may be responsible. The vulva and vaginal introitus are red, swollen, and oedematous, depending on the severity of the infection. There may be purulent discharge, in which case it should be possible to obtain some on a swab for immediate culture. Treatment with one of the sulphonamides or other appropriate antibiotics is usually quickly effective: daily baths with gentle washing and drying are also indicated. In resistant cases oestrogens (ethinyl oestradiol or stilboestrol) should be given by mouth, the dose being appropriate to age. For a child of 6 a daily dose of stilboestrol 0.5 mg. should be sufficient.

Another cause for discharge in childhood and infancy is a foreign body in the vagina. This may sometimes be

¹ Brewer, D. B., *Proc. Roy. Soc. Med.*, 1951, 44, 561.
² Rabin, H. A. et al., *New Engl. J. Med.*, 1952, 247, 921.
³ Ricketts, C. R., *Nature (Lond.)*, 1952, 169, 970.
⁴ Bull, J. P. et al., *Lancet*, 1949, 1, 134.
⁵ Maycock, W. d'A., *ibid.*, 1952, 1, 1081.

seen sticking in the introitus, when it may be readily removed. If the foreign body is well in the vagina, recognition is much more difficult, though it may be possible to feel it with a little finger in the rectum. For removal, admission to hospital and examination under anaesthesia with tiny specula (Kelly's cystoscope may be useful) is usually required.

Vaginal Discharge During the Child-bearing Years

Discharge at this time is fairly common and generally results from infection of the vagina or cervix. The two common forms of vaginitis are those due to *Trichomonas vaginalis* and to the fungus *Candida albicans*. Cervicitis is usually the result of lacerations at childbirth, with infection and failure of involution leading to chronic hypertrophy of the cervix, and thus to blockage of the cervical mucus-secreting glands with the formation of visible cysts, known as Nabothian follicles.

Trichomonas Vaginitis.—*T. vaginalis* is an oval flagellate with axostyle and undulating membrane; it is found in great numbers in the vaginal secretion in certain forms of vaginitis. The discharge in these cases is offensive and may cause a burning sensation: dyspareunia, dysuria, and frequency of micturition are other symptoms. In appearance the discharge is yellowish, watery, and slightly frothy. The vagina may be very tender: it looks inflamed, and widespread discrete red spots may be seen, giving the surface a strawberry-like appearance. Because of the activity of its three or four flagellae the organism is easily seen under the microscope in a fresh hanging-drop preparation. The source of infection is not known: though the disease is seen in virgins, there are cases in which transmission during coitus cannot be excluded, because the organism has been found in the subpreputial and prostatic secretions and in the bladder of the male. The organism causing vaginitis differs from that found in the mouth and large bowel. One perplexing observation is that *T. vaginalis* may be present in the vagina without causing any inflammation or other inconvenience. Treatment of the vaginitis, in the first instance, is by pessaries, such as those containing acetarsol or silver picrate. The patient should be told to insert one or two pessaries each night between two periods, and thereafter daily for the week immediately following the next two periods. This will cure most cases. Alternatively, antiseptics may be injected as a thick cream into the vagina by means of special applicators. Douches are of little value in the treatment of vaginitis: they may, however, be prescribed two or three times a week as a method of cleansing the vagina between treatments. Salt solution, one teaspoonful of salt to the pint (570 ml.), should then be used. For the few cases which are not cured, vaginal cleansing, drying, and powdering twice a week is required, using acetarsol or silver picrate powder. Insufflation of the vagina with antiseptic powder must never be carried out in pregnancy, because of the risk of fatal air-embolism. In resistant cases the possibility of reinfection by the husband should be considered.

Vaginal Thrush.—This form of vaginitis is particularly common during pregnancy and causes much local irritation. The findings are striking: the vaginal walls are covered with a thick white curd-like matter that adheres to the skin. Confirmation of the diagnosis is made by finding the characteristic spores and hyphae on microscopy. The urine in such cases should be particularly tested for sugar. Treatment comprises, first, vaginal cleansing under vision, with soap or detergent and water, until all the matter has been removed; and, secondly, antiseptic measures. The cleansing gives the patient immediate relief, and should be repeated twice a week. Thereafter the vagina, vestibule, and vulva are painted carefully and completely two or three times a week for two weeks with 1% gentian violet in water or 1% gentian violet in equal parts of spirit and water, care being taken that no vaginal folds are overlooked.

Alternatively, chlorophenesin ("mycil") pessaries may be advised. In resistant cases subclinical diabetes should be excluded by a sugar-tolerance curve.

Cervical Discharges

Cervical erosion is recognized by finding a circular area of velvety redness around the external os. This appearance results from the downgrowth of columnar epithelium from the cervical canal. If, in addition, there is overgrowth of the columnar epithelium the erosion is thrown into folds and may be called papillary. The condition is seen in virgin women and in women who have not borne children, and its cause is then unknown: in parous women infection at childbirth is probably the main factor, and the erosion is seldom seen without some cervicitis.

Chronic cervicitis produces a sticky discharge, not usually irritating or offensive unless there is some superadded vaginitis. It may also be associated with a number of other symptoms, particularly lower abdominal aching and backache, which probably originate from the tense, blocked cervical glands. The general health may be impaired. There may also be sterility, because the purulent cervical discharge is inimical to the spermatozoa.

The cervix in such cases is hypertrophied, lacerated, and often everted. The columnar epithelium of the canal may be exposed and may have replaced the squamous epithelium around the external os as in erosion. Mucoid material may be seen in the os, and when it is lifted away with forceps its stickiness is at once apparent. There may be an associated parametritis, when the woman may complain of pelvic pain, backache, and dyspareunia; then pain on moving the cervix is an important sign. Bacteriological examination of cervical discharges is necessary only if there is an associated urethritis or Bartholinitis, or if the condition does not respond to treatment; then specialist facilities are required because of the uncertainty in excluding gonococcal infection by smears and culture methods alone, and because of the advisability of blood tests.

Cervicitis may be materially improved by superficial linear cauterization of the cervix in the out-patient department, the anterior lip being treated one week and the posterior lip the next; but symptoms are unlikely to be completely relieved, at least in a severe case, until deep cauterization with electric hot-point, diathermy coagulation, or excision with knife or diathermy of a substantial part of the hypertrophied cervix has been carried out; for these latter procedures admission to hospital or nursing-home and anaesthesia are required. Treatment in this way is effective; there are few complications and little risk. The most troublesome complication is secondary haemorrhage occurring about the end of the second week. This is treated by morphine and rest if the bleeding is slight, and by a firm vaginal pack if bleeding is severe. Very occasionally a widespread pelvic infection flares up after cervical cauterization. In women over the age of 40 amputation of the cervix or even hysterectomy may be preferred.

The prevention of cervicitis is an aspect of intrapartum and post-partum care which tends to be neglected. During labour every care must be taken to prevent infection of the mother, by strict aseptic and antiseptic techniques and by keeping her away from the sources of infection. Should infection occur it must be treated adequately. When the woman is examined a month or so after delivery the examination should include a careful assessment of the state of the cervix and thorough speculum examination in a good light so that any cervical faults may be recognized and treated without delay.

Post-menopausal Discharges

After the menopause the lack of ovarian secretion leads to a partial atrophy of the vaginal epithelium, which together with lack of acidity at this time may allow infection to occur. A thin watery discharge results which may be blood-stained, and the vagina shows a widespread nuncate red

mottling. In such cases preliminary curettage, possibly cervix biopsy, and examination under anaesthesia are usually required to exclude genital cancer. Treatment of the vaginitis is first by oestrogen pessaries, one twice daily for two to three weeks, reserving stilboestrol 0.5 mg., or ethinyl oestradiol, 0.05 mg., daily by mouth, together with sulphonamides or antibiotics locally or parenterally, for resistant cases. Treatment with oestrogen by mouth should not be continued for more than 7 to 10 days at a time if the likelihood of oestrogen-withdrawal bleeding is to be kept to a minimum. Pessary treatment is less likely to cause such bleeding.

Also after the menopause are to be seen the discharges caused by retained and neglected pessaries and by other foreign bodies. After removal of the irritant the discharge usually clears up quickly unless some permanent damage has resulted.

After the menopause and after surgical procedures on the cervix there may be some cervical stenosis leading to accumulation of fluid or pus in the uterus, forming a hydro-metra or pyometra. This may discharge suddenly or intermittently. Examination under anaesthesia and dilatation and curettage are required in such cases to establish the diagnosis, to promote drainage, and to exclude associated cancer.

Miscellaneous Causes of Discharge

Every now and then a woman is seen with a severe vaginitis which is being maintained by treatment. Douching with antiseptics can cause a severe vaginitis either because the antiseptic remains on the skin in high concentration after the water has evaporated or, more likely, because of skin sensitivity; the daily wearing of a tampon can also cause much local irritation. To stop all local applications is the obvious first treatment in such cases; often no other therapy is required.

More troublesome is the occasional patient who has a vaginitis, often of unknown aetiology, in which the epithelium in some part of the vagina, perhaps at the vault, is seriously devitalized, being thin, atrophic, and often with great loss of mobility. The most that can be done in such cases is to search diligently for the cause, while trying by the judicious use of oestrogens locally and tonic measures generally to improve the patient's healing powers. Meantime temporary avoidance of coitus is desirable to encourage healing.

It is worth bearing in mind that watery discharges may be urinary in origin. If dating from a difficult confinement or operation, there may be a tiny vesico-vaginal fistula, perhaps with a sinuous tract and only discharging intermittently. Closely allied are the very rare cases in which a cyst of Wolffian duct origin has an external opening and discharges a small amount of fluid. Perineal sinuses, stitch abscesses, and tiny rectal fistulae can all cause vaginal discharge. The appropriate surgical treatment is required for all such cases.

A watery blood-stained discharge is an important sign of early carcinoma of the genital tract, especially carcinoma of the cervix and of the corpus uteri. If there is any suspicion of these diseases, careful examination under anaesthesia, biopsy of the cervix, and dilatation and curettage must be carried out without delay.

Next Refresher Course Article.—"Scrotal Swellings," by Mr. R. J. McNeill Love.

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

BRITISH EMPIRE CANCER CAMPAIGN

REPORT FOR 1952

The thirteenth annual report of the British Empire Cancer Campaign, covering the year 1952, is an impressive volume of over 400 pages. It records the results of work in many centres in Britain; deals briefly with cancer research in Canada, New Zealand, Australia, and South Africa; and describes the researches of individual investigators supported by the Campaign, of Campaign Fellows, and of Campaign Exchange Fellows. In 1952 income from donations, collection, and legacies was £318,773, the highest figure so far attained. The total is £59,000 above the previous year, mainly owing to a large increase from legacies, which amounted to £138,416. In addition £19,393 was received from investments. The Campaign spent £221,439 on cancer research, £36,623 on appeals and publicity, and £8,162 on administration. There was a balance of £88,910 of income over expenditure at the end of the year.

The Campaign is attacking cancer on a wide front. This is evident from the admirable summary, by Lord Horder and Sir Heneage Ogilvie, of the work supported. There are sections on experimental and clinical carcinogenesis, hormones, the biochemistry of growth, tumour viruses, experimental chemotherapy, radiation chemistry and radiobiology, radiotherapy, and clinical pathology.

Clinical Pointers

Technical advances in radiotherapy which make it more effective, yet at the same time less unpleasant for the patient, are a major contribution to cancer research. There is, for instance, the use of very high-powered radiotherapy units. As long as 15 years ago a million-volt machine was being used in Britain, and to-day there are several operating at 2 MeV. Now, apparently, with the installation of x-ray equipment operating at voltages up to 30 MeV, we are about to enter what is likely to be the last phase of this line of advance. To reach this stage a great deal of painstaking physical and biological research has been necessary. At the Middlesex Hospital the much less costly "rotational therapy" method of delivering a large radiation dose to deep-seated lesions is being investigated, and the results appear promising. Work at Cambridge suggests that the combination of a chemical radiosensitizer ("synkavit") with conventional x-ray therapy may prolong the lives of those with inoperable bronchial carcinoma. At many centres the possibilities of radioactive isotopes are being eagerly explored. In contrast with the success of physical methods in treating cancer, trials of new chemotherapeutic substances have been less fruitful; nor has the work on hormones yielded any new lines of treatment for immediate application.

What may be termed environmental cancers have received their full measure of study. A suggestion that coal smoke and tobacco smoking may act together after the manner of a carcinogen and a co-carcinogen in causing lung cancer is being checked by studying the amount of carbon in the lungs and bronchial glands. Questions such as, Why is lung cancer rare in coal-miners? Why is it common in London, in both sexes? are being examined by statistical methods. Other experiments aim at isolating their carcinogenic activity in animals. Bladder cancer in dye-workers has been the subject of a four-year field study and of a report to the Association of British Chemical Manufacturers. Some interesting findings have emerged: each individual carcinogen has a characteristic induction time, and the age at which tumours appear depends on when exposure began; and, although incidence may depend on severity of exposure, the induction time is not affected by this. In parallel with the field work, the carcinogenic properties of the aromatic amines have been studied in the laboratory. Among other things, this may help in deciding which of them are too dangerous for industrial use. With a similar object, the carcinogenic activity of crude oils and their fractions has

been assessed. Several Kuwait and Lagunillas sub-fractions are strongly carcinogenic in rabbits.

Among other observations of direct clinical use is the recognition of the value of serial biopsies during radio-logical treatment of carcinoma of the cervix (this permits the rapid recognition of radio-resistant cases which can then be treated surgically), and of restricting salt intake after uretero-colic anastomosis for bladder tumours (this reduces the mortality from disordered metabolism). Another study defines the place of local *versus* widespread excision in the treatment of malignant rectal polyps.

Radioactive cobalt dust was found to have been leaking from the radio-cobalt units in Leeds and Sheffield, and radioactivity was detected in their operators. However, the amounts absorbed were well within the safety range, and the faults in the machines have been dealt with.

Fundamental Research

It is a truism that, when dealing with a really stubborn problem, the quickest solution is not always the most direct. This is certainly so in medical research, and much of the report of the British Empire Cancer Campaign is concerned with fundamental research. From a host of such studies it is possible to pick out only a few for remark. Some of the most interesting work is on the way in which chromosomal aberrations take place. By applying a chemical mutagen to the root-tip cells of beans it has been possible to observe what happens. This has led to an entirely new interpretation of chromosomal aberrations; namely, that chromosome breakage and reunion are simultaneous, the event being similar in nature to chiasma formation in meiosis. In the words of the report, "There is no need to emphasize the importance which would attach to any correlation between mutagenesis, carcinogenesis, and something akin to the physiological process of meiosis, rather than through a more random mechanism of damage and repair by chance."

Anything that adds to our knowledge of the processes of normal growth may throw light on the disordered growth of cancer: hence the interest of the observation that in the chick embryo ascorbic acid synthesis is related to the rate of growth. The next step, which is being taken, is to see whether this applies to tumour tissue also.

Lastly, from this mine of material, one experiment may be selected for its technical virtuosity. It has proved possible to take the nucleus from one amoeba and exchange it with that of another. This remarkable feat has been used to study the effects of nitrogen mustard and x rays on nucleus and cytoplasm separately. The results show that direct damage is done to both nucleus and cytoplasm, although the nucleus is the rather more vulnerable of the two.

Pedestrians over 60 are involved in a high proportion of road accidents, and, as the ratio of people in the higher age groups is increasing, their safety on the roads is becoming a greater problem. In March the Pedestrians' Association held a conference on this subject, and the report of this meeting has now been published by the association. Road accidents are often due to the inability of the elderly to adapt themselves to the speed and volume of modern traffic. The report recommends that local authorities and road safety committees should, where necessary, provide special facilities for old persons to cross the road. Propaganda should be directed to drivers, many of whom make insufficient allowance for the limitations of the elderly. Conductors of public vehicles should show special consideration for elderly passengers. The old people themselves should be given advice about road usage, and clergy and social workers among old people should use their opportunities to do this. Lame and infirm persons should, if possible, be accompanied on the roads; risks of accidents to them could be minimized by the organization of a rota of neighbours, social workers, etc., to do their shopping. The report costs 1s. (by post 1s. 2d.), and is obtainable from Mitre House, 44-45, Fleet Street, London, E.C.4.

Correspondence

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

Male Pseudohermaphroditism

SIR,—I have read with the greatest interest the account by Drs. D. C. Beatty, C. J. Champ, and G. I. M. Swyer of "A Case of Male Pseudohermaphroditism" (*Journal*, June 20, p. 1369), since a case which conforms fairly closely to the clinical picture which they describe has come under my own observation, and forms the subject of a chapter ("Features in the Analysis of a Patient with a Physical Genital Abnormality") in my recent book.¹ My interest in the case was primarily psychiatric, the individual in question having been referred to me by "her" family doctor for psychotherapy on account of symptoms of anxiety and periodic depression. Accordingly, my reference to the physical aspects of the case is only incidental—which is perhaps unfortunate from the standpoint of general medicine, since I understand that only a few such cases have been described in the literature. It is also unfortunate from this standpoint that I found it necessary to withhold certain interesting data from my account and to leave others intentionally vague for reasons of discretion. My account is subject to further limitations in consequence of the fact that, although it was not published until 1952, it was written in 1930 for a meeting of the British Psycho-Analytical Society on January 21, 1931; for at that time knowledge regarding the sex hormones was less advanced than it is to-day, and laboratory facilities for their investigation were comparatively undeveloped. Also, I did not feel it justifiable to seek confirmation of the nature of the gonads by subjecting the patient to exploratory surgical intervention solely in the interests of scientific curiosity, especially since the effect of such intervention and of discovery of the data thereby revealed might well have inflicted a psychological trauma upon the patient, whose mental equilibrium was already precarious. The interested reader will perhaps desire to refer to my published account; but I take the opportunity to draw attention to certain of the data which it contains.

The patient to whom I refer had always been regarded as female, even after the discovery of her abnormality by her family doctor, whose introductory letter included the following statement: "She appeared to be a perfectly normal child until she reached the age of puberty. She began then to grow unduly tall, but did not menstruate, but kept perfectly well. When she was about 20 I was consulted, and made an examination. I found . . . only a pin-head opening as a vagina which led nowhere. As she felt perfectly well, nothing further was done."

Accepting the doctor's account, I took no steps to initiate a more detailed physical investigation before proceeding with psychotherapeutic treatment. As treatment proceeded, however, I began to entertain doubts not only regarding the adequacy of his account, but also regarding the sex to which "she" properly belonged. Accordingly, I arranged for the patient to be examined by a distinguished gynecologist, who reported it as his impression that the case was one of male pseudohermaphroditism, and who described his findings in the following terms: "The general development is strongly masculine; the chest is very broad, but the mammary development is, if anything, more suggestive of the female type in that the tissue is soft and slightly dependent. The pubic hair is normal in its distribution for the female, and the more superficial organs are quite definitely female—namely, labia, mons, clitoris, vestibule, and urethra. The hymen is completely closed, and is represented by a series of small bands crossing the site of the normal depression. Rectal examination was not easy, but . . . no cervix or uterine body was made out. These, under ordinary circumstances, are usually made out with perfect ease by this route. At the same time the examination was not sufficiently complete to exclude the presence of an imperfectly developed organ. The general impression which I have formed is that we are dealing with a condition of essential masculinity with the presence of male gonads accompanied by secondary characters of a female type."

It may be added that, in spite of his diagnosis, the gynaecologist agreed with my opinion that it would be inadvisable to acquaint the patient with the nature of his findings. Doubts were, however, subsequently cast upon the diagnosis when a specimen of the patient's urine was examined for oestrin and gonadotropic content, and reported upon as follows: "Oestrin—at least 20 mouse units per 24 hours. Gonadotropic content—less than 100 mouse units of follicular maturation hormone per 24 hours. These excretion results are similar to those usually obtained in a female subject, and the oestrin excretion is higher than would be expected in a male. The results suggest the presence of female secretory gonads."

In the light of this report I considered it all the more desirable to continue, for practical purposes at any rate, to regard the patient as a female.

The case in question differs interestingly from that described by Beatty, Champ, and Swyer in the facts that pubic hair was present and that the patient was abnormally tall (about 6 ft. 4 in. (1.93 m.)). Another interesting feature was that during adolescence she was subject to recurrent rectal haemorrhages which lent themselves to interpretation in terms of vicarious menstruation, and which were actually mistaken for proper menstrual periods. These were followed *later in life* by periodical bouts of epistaxis, which lent themselves to a similar interpretation. It is also a striking fact that, while under my observation, she always spoke quite spontaneously of her periodic attacks of depression as "being unwell," and would also speak of "missing a turn" when an attack was deferred for longer than usual. The case conformed to the description of Beatty, Champ, and Swyer in that she had a definitely female mentality and displayed no evidence of Lesbian characteristics; and it may be added that her libido was highly developed towards men, and that men seemed to find her singularly attractive.

In conclusion it is of interest to record that an identical abnormality was present in several of her numerous sisters, the remainder of whom were normal women, married, and the mothers of children.—I am, etc.,

W. RONALD D. FAIRBAIRN.

REFERENCE

¹ *Psychoanalytic Studies of the Personality*, 1952, p. 197. Tavistock Publications, Ltd., London.

Mean Body Weight, Food Intake, and Temperature

SIR,—Although Alice's consumption of cake and mushroom was undoubtedly responsible for some of the variations in her size, and hence presumably weight, it was, significantly, the White Rabbit's fan that she dropped hastily to avoid shrinking away altogether. The fact that the fan was overlooked when its owner discovered Alice is no excuse for it to be forgotten in preoccupation with other matters this side of the rabbit hole. In the discussion of the valuable paper by Mr. J. M. Harries and Miss D. F. Hollingsworth (*Journal*, January 10, p. 75) little reference was made to non-dietary factors, other than activity, affecting body weight: the suggestion therefore that weight data can be used as an "index of inadequacy in food supplies" deserves some comment.

The closeness of the demonstrated weight-calorie relationship is paralleled by that between weight and mean temperature of the month in which it was recorded. The correlation coefficients for the whole series are respectively $r_{cw} = +0.612$, $r_{tw} = -0.730$, both highly significant; these may be obtained from the analysis, given in the table, of variance and co-variance, calculations permissible since serial correlations in the weight series used were not significant and since there was no reason to assume serial correlations in the independent variates. That these correlations were independent of each other is shown by the partial correlation coefficients ($r_{cw.t} = +0.586$, $r_{tw.c} = -0.714$). The temperature factor therefore should also be considered in assessment of the adequacy of food supplies from body weight.

Several points of interest emerge from the figures in this table. Limitations of the data may well account for the insignificant contributions by temperature and calories to the small residual sum of squares for weight. The caloric effect predominates in the longer term weight fluctuations and contributes little to the seasonal variations, while it is in the latter that the temperature effect is most marked. Thus it might appear that the state of food supply in Britain is indicated by mean body weight if this is observed over a long period—long enough, that is, for temperature fluctuations to be cancelled out. However, caution is still necessary, since differences in weight from year to year remain

*Analysis of Variance and Co-variance of Mean Weight (Males),
Temperature, and Calorie Intake*

Source	Degrees of Freedom	Sums of Squares			Sums of Products		
		Weight	Temperature	Calories	Wt./Temp.	Temp./Cal.	Wt./Cal.
Years	5	8.6174	37.53	51,854	-4.225	-435.4	+514.7
Quarters	15	11.2815	1,720.68	9,918	-136.164	+3,173.9	+286.8
Residual	15	1.1067	74.68	27,369	-2.381	-4.552	+35.3
Total	23	21.0056	1,832.89	89,141	-143.270	-4.0645	+837.0

highly significant after allowance is made for calorie intake, both alone and in combination with temperature. Some further influence thus appears to operate on long-period variations in weight, and hence not all such can be used to diagnose dietary adequacy or inadequacy. Not all of Alice's metamorphoses were occasioned by what she ate and by the White Rabbit's fan.

The writer wishes to acknowledge his indebtedness to Mr. M. H. Quenouille, of the Institute of Statistics, Oxford, who advised upon statistical procedures, and to Mr. Harries and Miss Hollingsworth, of the Ministry of Food, who made available their data for further examination, which was prompted not by any spirit of unappreciative criticism but rather by the wider implications of their work.—I am, etc.,

Oxford.

D. F. ROBERTS.

Peptic Ulcer in Women

SIR,—Mr. D. H. Clark's article on peptic ulcer in women (*Journal*, June 6, p. 1254) essentially confirms the findings of previous authors and establishes the absence or disappearance of peptic ulcer symptoms during pregnancy as the most impressively unequivocal coefficient in the natural history of this much studied and as yet incompletely understood condition.

In Mr. Clark's series of 400 women over the age of 21 with histories of peptic ulceration, 204 of whom had reached the menopause, only 118 had pregnancies, and it would be interesting to know how this proportion compares with a similar but unselected group of women in the same town. Should the incidence of pregnancies in Mr. Clark's series be significantly lower than in the unselected sample, this would enhance the importance of his observations on the reverse aspect of the correlation—namely, the frequency of pregnancy toxicoses in sufferers from peptic ulceration in whom the ulcer symptoms persisted or recurred during pregnancy. The possibility then arises of an abnormality of the endocrine secretions being the common factor underlying peptic ulceration, some cases of pregnancy toxicosis, and at least one circumscribed type of sterility in women. The data suggest strongly a correlation between the secretion of some of the sex hormones and the inhibition of the periodicity of peptic ulceration and emphasize *inter alia* the need to study the curious and often dramatic action of gonadotrophic hormones of placental origin on the symptoms of peptic ulcer patients. This does not imply that gonadotrophic hormone produced during pregnancy has a specific effect or even any direct effect upon ulceration, but only indicates that it is involved in some manner, a subject which I have recently discussed elsewhere (*Lancet*, 1953, 1, 1000).—I am, etc.,

London, W.1.

T. CSATO.

Intravenous Barbiturates for Drunkenness

SIR.—Dr. Peter Nobes's comments (*Journal*, April 11, p. 836) to my letter on this subject (*Journal*, January 17, p. 163) call for a reply in defence of my procedure in dealing with such cases.

Dr. Nobes theorizes on what might happen if my procedure was adopted for "obstreperous drunks," but surely such complications as "silent regurgitation" and "glottic spasm" are no more a danger here than in any of the emergency cases that receive a similar dose of any intravenous barbiturate. Moreover, I think I am right in saying that when the stage of obstreperous behaviour is reached

such cases have an empty stomach, either from an earlier stage of vomiting or from having digested what was already there. However, I wonder if Dr. Nobes has ever tried to wash out the stomach of an obstreperous drunk.

I do not think that the fact of my series of cases coming through without a mishap was just pure luck on my part. None of them developed a venous thrombosis with the 10% solution either.—I am, etc.,

Tumatumari, British Guiana.

A. M. BARTLEY.

Amphetamine

SIR.—The element of historical interest introduced in your leading article "Mr. Macleod on the Drug Bill" (*Journal*, June 20, p. 1380) is somewhat misleading. The volatile amine— β -phenylisopropylamine (amphetamine)—was first prepared from phenylmethylacrylic acid by Edleano in 1887.¹ In 1910 Barger and Dale,² during a pharmacological examination of aromatic amines, described this drug as a member of a group of similar substances to which they gave the name "sympathomimetic." For 20 years thereafter no attention was paid to this compound, the interest of investigators being centred on ephedrine.

Amphetamine sulphate ("benzedrine") was first prepared and investigated by G. A. Alles in 1927³ also in the course of a search for a compound better than ephedrine. He discovered its stimulating effect on the central nervous system and suggested that this might have therapeutic value. At that time attention was focused on the peripheral effects of the amine, and through the pioneer work of Messrs. Smith, Kline, and French Laboratories, of Philadelphia, the base was introduced to the medical world in 1932 as the first volatile nasal vasoconstrictor. However, they also started an extensive pharmacological investigation to follow up the observations made by Alles on the systemic action of the drug, and in 1935 Prinzmetal and Bloomberg⁴ were able to report on the value of amphetamine sulphate in narcolepsy—a condition in which it is now regarded as diagnostic and specific. Since that date the value of this drug has been confirmed in a wide range of clinical conditions.

The anorexigenic properties of the amphetamines were first reported as a side reaction when the drug was used for its psychic effects⁵ and amphetamine sulphate found some use as an aid in the treatment of overweight. However, as a result of further work the dextro-isomer—dexamphetamine sulphate ("dexedrine")—was isolated and made available some 10 years later, and was found to be preferable in this and a number of other conditions. It thus appears that this valuable drug, although known since 1887, was ignored until its potentialities were explored and developed by a pharmaceutical house.

This is an example of the special contribution made by pharmaceutical manufacturers to medical practice—the way in which they are able to develop and extend a new discovery and greatly reduce the time interval between laboratory work and its clinical application.—I am, etc.,

London, S.E.5.

T. C. BLACK,
Menley and James, Ltd.

REFERENCES

- ¹ Ber. dtsch. chem. Ges., 1887, 20, 616.
- ² J. Physiol. (Lond.), 1910, 41, 19.
- ³ J. Pharmacol., 1927, 32, 121.
- ⁴ J. Amer. med. Ass., 1935, 105, 2051.
- ⁵ Nathanson, M. H., ibid., 1937, 108, 528.

Medical Auxiliaries

SIR.—I do not think that those who advocate freedom for study and work for all will agree with the opinion expressed in your leading article on medical auxiliaries (*Journal*, June 6, p. 1267).

The decision of the Minister of Health to give equal rights to the three associations of physiotherapists and not to accept monopoly in favour of the Chartered Society, far from being a "meagre conclusion," is, in fact, an act of justice and statesmanship. I am the first to recognize the good work done by the Chartered Society, but it is common knowledge that the Physiotherapists Association and the Faculty of Physiotherapists include at least equally well trained and skilled physiotherapists who are doing excellent work. To refuse these keen workers hospital facilities to study, and to bar them from hospital employment, would be an arbitrary and

unjustified measure. As the monopoly in favour of the Chartered Society has been proposed by a committee composed, apart from the president and two Government officials, by six other members all connected with the Chartered Society, it is not astonishing that the Government demanded a wider inquiry which resulted in the declaration of the Minister of Health: "Fairness to all societies concerned."

I cannot understand why this decision of the Minister has been considered as a criticism of the Cope report. This report represents a painstaking work in which general directions are proposed for medical auxiliaries. It is unfortunate that this question of monopoly has cropped up, but surely an amicable settlement of this vexed problem can be reached.

We are in great need of good physiotherapists, but for that we must avoid monopolies and exclusiveness. We must open wide the portals of the hospitals to all those wishing to devote themselves to that branch of the healing art, demanding from them not a label of any particular association but keenness, hard work, and skill.—I am, etc.,

London, W.1.

A. P. CAWADIAS.

Children in Hospital

SIR.—It is believed that the Ministry is encouraging an increase of visiting at children's hospitals. It would seem that this is related to the annotation (*Journal*, March 14, p. 609) in which daily visiting at Great Ormond Street Hospital for Sick Children was favourably reported. I have nothing to say on the medical or administrative angle of this matter with regard to a short-term hospital, but with regard to the long-stay orthopaedic hospital I think frequent visiting is distinctly detrimental to the children. It should be realized that in long-stay hospitals the child has to make an entirely new adjustment to a life which is likely to continue for two or more years. Frequent visiting delays or utterly prevents this adjustment by reminding the child constantly of home life. It is very noticeable that new arrivals are upset by the first few visiting days which they experience, and there is little doubt that the quickest, and possibly the kindest, way of bringing about adjustment would be the prohibiting of visiting altogether, or at least during the first six weeks of admission—as is done at most boarding schools.

At this hospital we have endeavoured to achieve a compromise by fortnightly visiting, and we find that after the first six weeks the children look forward to visiting day with good cheer and manage to keep in touch with their parents in this way without being gravely upset when the visit closes. The opinion has been expressed elsewhere that infections are not introduced to children's hospitals on visiting days. It has been noticeable nevertheless that the majority of new infections and dietetic upsets are referable to the past visiting day.

A further consideration which should not be neglected with regard to visiting at long-stay hospitals is the hardship inflicted on parents who naturally feel they must visit their children as often as possible. The majority can and do manage a long journey every alternate week-end for months or years, at very considerable sacrifice. Many beggar themselves by bringing a multitude of toys on each occasion—toys which are usually broken within two or three days of the visit. There remains, however, a proportion of parents who absolutely cannot manage to visit as frequently as the rest and therefore their little one finds itself isolated on visiting days. Visiting permitted more frequently than fortnightly would enhance the hardship to the parents and increase the discrimination between visited and neglected children which the unfortunate children are incapable of understanding and therefore of tolerating.

This problem is a delicate one, and no effort should be made by the administrators to interfere with what is primarily a medical decision, which must be governed by individual hospital circumstances. It is also worth remembering that it is foolish to abandon a tried and reasonably satisfactory position in favour of an untried theoretical improvement if it is probably impossible to return to it should the theory prove false (cf., among other things, nationalization).—I am, etc.,

Burton-on-Trent.

RANDLE LUNT.

Electro-convulsive Therapy

SIR.—The following method is used for giving electro-convulsive therapy at Cork Mental Hospital. The patient receives 1/100 gr. (0.65 mg.) atropine sulphate ten minutes before stimulus, followed by thiopentone sodium, 0.15–0.25 g. intravenously. The syringe is disconnected, but the needle remains intact, and through it is injected succinylcholine, 50 mg. As soon as fibrillation ceases the patient's lungs are inflated 3–4 times with oxygen, using a mask and rebreathing bag. The headpiece is then applied and the electrical stimulus is given.

We would like to record the following observation which may be of interest. If the pupil contracts immediately after the stimulus we have noticed that a convulsion very rarely occurs. Owing to the short time factor involved before the succinylcholine wears away, we now feel it safe to give another stimulus straight away, as there seems to be little danger of a delayed convulsion. We have found this sign very useful and wondered if other readers have had any similar experience.—We are, etc.,

E. THOMAS.

B. F. HONAN.

Cork.

Christmas Disease

SIR.—The correspondence which has followed publication of the article by Dr. Rosemary Biggs and colleagues on "Christmas Disease" (*Journal*, December 27, 1952, p. 1378) has raised several important questions, including that of nomenclature. Dr. A. S. Wiener's suggestion that this disease be called haemophilia II or B (*Journal*, March 7, p. 559) has merit because it focuses attention on the genetic similarity to classical haemophilia. His proposal, however, is based on the assumption that the mutant genes for classical haemophilia and Christmas disease occupy the same locus on the X chromosome—that is, they are alleles. We believe this assumption to be incorrect. There are well-defined differences, biological and chemical, between the normal plasma components which prevent haemophilia and Christmas disease. For example, the factor preventing haemophilia (AHF) is not absorbed by BaSO₄, and its activity diminishes during clotting. On the other hand, the "Christmas factor" is absorbed on to BaSO₄, and its activity increases during clotting.

It was suggested that the same allelic relationship exists between Christmas disease and classical haemophilia as exists between mild and classical haemophilia. This analogy, we believe, is unsound. The two forms of haemophilia, resulting from different degrees of reduction of the identical plasma protein, AHF, are due to the mutant genes *h* and *h^m*; Christmas disease, resulting from diminution of an entirely different protein, is probably due to a mutant at a different locus on the X chromosome. The facts that normal plasmas, even in males with the single X chromosome, possess both AHF and Christmas factor, that haemophilic plasma contains "Christmas factor," and that AHF is present in Christmas disease can hardly be interpreted in any other fashion. Linkage studies would be most valuable.

As for the problem of nomenclature, we suggest that haemophilia and Christmas disease be grouped with the other haemorrhagic diatheses which are characterized by absence or malfunction of a specific plasma protein required for normal clotting, and a resultant clotting defect due to impaired conversion of prothrombin to thrombin. Haemophilia is the archetype of this group of diseases. The name "haemophilia" is hallowed by tradition and deeply ingrained in the literature; we suggest that its use be limited to those haemorrhagic states due to inadequate AHF. For the other diseases meeting the above criteria we suggest the term "haemophiloid states."

The following table indicates the presently described members of this group of haemorrhagic diseases. The proposed classification has the merits of simplicity and elasticity. When the exact chemical impairment in each disease is

known, more meaningful terms, neither eponymic nor arbitrary, can be applied. An elaboration of this classification, along with diagnostic criteria, will be published soon.

Disease State	Synonyms
Haemophilia	
Haemophiloid state A	Parahaemophilia, accelerin, or AcG deficiency
Haemophiloid state B	Hypoproconvertinaemia, spca-deficiency
Haemophiloid state C	"Christmas disease," PTC-deficiency
Haemophiloid state D	PTA-deficiency.

—We are, etc.,

JOHN B. GRAHAM.

K. M. BRINKHOUS.

Chapel Hill, N. Carolina.

Controlled Respiration and Apnoea in Anaesthesia

SIR.—Dr. Gordon M. Wyant (*Journal*, June 13, p. 1334) recommends anaesthetists not to lose sight of the fact that apnoea "is essentially an unphysiological state of affairs." Now what does Dr. Wyant mean by "unphysiological"? How, for example, would he achieve, in his sense, "physiological anaesthesia"? Surely it must be admitted that anaesthesia essentially is unphysiological, in that it involves interference with the normal mechanisms of maintaining the internal environment. It is, for example, true to say that under general anaesthesia it is impossible to produce relaxation of the abdominal muscles without some involvement of the respiration. It is under these conditions that "the lesser of the two evils" is to have ventilation of the lungs which is artificial but efficient, rather than that which is natural and impaired.

Professor E. A. Pask (*Journal*, May 9, 1948), writing on the same subject, believes that "many physiologists will be surprised to learn that positive pressure ventilations can be carried out at all without causing some disturbance in the cardiovascular system." It is not clear in this context whether he necessarily implies by the term "disturbance" a resultant reduced efficiency. We are sure he would join us in wishing to refer these physiologists to the all-important work on human subjects carried out by Courmand and his colleagues.¹ These workers showed that, given the correct intrapulmonary pressure curve, artificial inflation of the lungs did not, in fact, impair cardiac function.

We would conclude with two points: (1) It appears that the term "unphysiological" is being too loosely used. In artificial circumstances, for example, during anaesthesia, the maintenance of the internal environment to comply with cellular requirements—that is, normal physiology in Claude Bernard's sense—may imply the use of artificial methods. (2) Many in the vanguard of modern anaesthetic progress still maintain a regard amounting almost to a superstition for the authority of the—to quote Professor Pask—"old-fashioned" anaesthetist. We are not, however, prepared to believe that the virtue of being old-fashioned gives any doctrinal authority in respect to the matters under discussion.—We are, etc.,

G. JACKSON REES.

T. CECIL GRAY.

Liverpool.

REFERENCE

- ¹ Amer. J. Physiol., 1948, 152, 162.

The Post-operative Chest

SIR.—Mr. V. J. Downie's remarks regarding the treatment of the "post-operative chest" (*Journal*, June 20, p. 1388) cannot be allowed to pass without comment.

During the past 25 years or so, many workers have investigated this problem very carefully; if would be a great pity if their work were to be wasted because it came to be accepted that prevention and treatment based on a proper understanding of the pathology of this condition was of little or no importance. Mr. Downie suggests that a good anaesthetic technique will prevent these complications. This is certainly not the case. A bad anaesthetic technique may certainly increase the incidence of post-operative chest com-

plications, but the best technique cannot reduce it below a certain minimum level. This is because anaesthesia, if any reasonable technique is used, is not an important factor in the causation of the condition. The cause of nearly all post-operative chest complications is the gross interference with respiratory mechanics and in particular with the cough mechanism which results from certain operative procedures—notably upper abdominal incisions, hernia repair, thoracotomy, and thyroidectomy. When the operation does not involve one of these incisions post-operative chest complications (apart from hypostatic pneumonia in the old, enfeebled patient) are practically non-existent. I recently anaesthetized a patient suffering from chronic bronchitis for repair of a ventral hernia using a ventral sheath block combined with a small dose of thiopentone. Post-operatively he developed a well-marked basal segmental collapse with pyrexia and mucopurulent sputum. It is difficult to see how the anaesthetic could have caused this, but one had only to watch the patient for a few minutes to appreciate the very real difficulty he had in coughing up his sputum.

I quite agree that it is very doubtful if post-operative segmental collapse commonly results in bronchiectasis, but I do not think that this is any reason for failing to treat a condition which is usually easily diagnosed and which often responds to relatively simple measures. It is true that these cases "respond" to antibiotics in that the temperature returns to normal, and I agree that they have an important part to play in prevention and treatment. Nevertheless they often fail to have any effect on the underlying pathological condition, which is the blocked bronchus. Several years ago, as a junior resident anaesthetist, I saw a patient discharged from hospital with definite radiological signs of segmental collapse, the result of an operation about two weeks earlier, still present. She had been on routine penicillin, and there was little in the way of symptoms or general upset. I do not think that either the patient herself or the surgeon in charge realized that there had been any pulmonary complication. Quite probably her atelectasis later expanded without leaving any permanent pulmonary damage, but I think it would have been better if she could have left hospital with her lungs in the same condition as when she entered.

Prevention and treatment need not be either elaborate or expensive, and certainly should not be aggressive. Routine breathing exercises by themselves are useless and a waste of time (I do not, of course, deny that they have an important part to play in the preparation of the patient for certain operations). There is no substitute for the careful pre- and post-operative examination and individual treatment of each patient undergoing the type of operation I have mentioned. When atelectasis is diagnosed or suspected the patient must be encouraged and assisted to clear the blocked-bronchus in whatever way seems best for him. If simpler methods fail bronchoscopic suction should probably be used, although it is rarely necessary.

The last word on this problem has probably not been said. The value of the routine use of bronchial anti-spasmodics has not, I feel, been proved. Nevertheless, using the relatively simple methods so clearly set out by Brock¹ many years ago, we can do much towards the prevention and satisfactory treatment of post-operative chest complications to the probable benefit of the patient.—I am, etc.,

W. S. DAVIS.

Omagh, Co. Tyrone.

REFERENCE

¹ *Guy's Hosp. Rep.*, 1936, 86, 191.

Possible Sequel of Treating Infants in Erect Posture

SIR,—At the follow-up clinic last week I saw two infants, both aged nearly 7 months, who had been treated for hiatus hernia by being placed in the erect posture day and night for the last four months. Both of them now have skulls somewhat flat on the top, and the circumference of one is 17½ in. (45 cm.) and of the other 18½ in. (46.7 cm.). The skulls appear to have altered in shape, and have not the characteristics of those of other members of the families.

It is possible, I believe, that such a shape of skull may be a sequel of treatment in the erect posture. The condition is being further investigated, but I write now to ask if any other observers have found flattening of the skull resulting from such treatment.—I am, etc.,

Aberdeen.

JOHN CRAIG.

Intravenous Pituitary Extract in the Control of Haemoptysis

SIR,—I feel that a word of caution should be added to the letter by Dr. N. D. J. de S. Wijesekera (*Journal*, June 20, p. 1389) on the use of intravenous pituitary extract in the control of haemoptysis. In the course of clinical investigations on the action of pituitary extract—admittedly for reasons far removed from the control of haemoptysis—I have given scores of injections by various routes and have come to regard the single-dose, intravenous injection with a respect bordering on trepidation. Dr. Wijesekera was fortunate that after the administration of 10 units no more ill effect was seen than that "the patient's face assumed a cadaverous hue except for a faint malar flush." I strongly urge that if this very potent substance is to be given intravenously by a single injection a dose of one unit (or certainly not more than two units) should be used, and this small volume of solution well diluted in saline and given very slowly, as Dr. Wijesekera in fact advises. If intramuscular injection is employed a somewhat larger dose may be permissible.

To compare the doses employed by workers 40 years ago with those in use to-day is meaningless, for standardization of pituitary extract did not become established until the late nineteen-twenties.—I am, etc.,

Oxford.

J. CHASSAR MOIR.

Television Glaucoma

SIR,—Since the advent of television to Northern Ireland I believe the following is the first case of acute glaucoma which commenced while the patient was viewing television.

A lady of 80 years of age, seeing television for the first time, watched with enthusiasm the Coronation service and processions. During the late afternoon her right eye became red and painful. When seen by me the following day the eyeball was hard and congested, the cornea was hazy, and the pupil was dilated—typical acute congestive glaucoma. She was unaware of any previous eye trouble.

It is well known that when instability of intra-ocular tension exists an abnormal rise of tension may take place on remaining in a dark room or when accommodating, as on close reading for about an hour. It would thus appear that prolonged periods of television viewing, especially in a darkened room, are not without risk to the aged and to those with certain recognized eye defects.—I am, etc.,

Belfast.

V. A. F. MARTIN.

Mammary Abscess

SIR,—The limitations of the antibiotics in curing mammary abscess are referred to in Mr. C. P. Mills's paper (*Journal*, June 27, p. 1427), as also are the difficulties encountered later in dealing surgically with encapsulated pus.

Early drainage would appear to be indicated by Mr. Mills except in those cases which were effectively treated with an appropriate antibiotic in the initial acute stage. Even assuming that most, if not all, the infections are staphylococcal, it must be extremely difficult to isolate the causal organism in the early inflammatory stages. Many inflammatory symptoms of mastitis disappear entirely without treatment, and pus formation is a late present themselves after they have been discharged from the maternity hospital.

My experience as a medical officer of health and former superintendent of hospitals has been that mastitis is primarily a readily either to faulty technique or to individual members of the staff. Empirical measures, based on the assumption that the causal organism builds up in the dust and air of the wards from time to time, have been successful in reducing dramatically any outbreak. The tragedy lies in the fact that much suffering and disability occurs before these measures—which temporarily disorganize the hospital—can be taken.

It has always appeared to me as an epidemiologist that maternity hospital infections should be preventable and that

the staphylococcus—the enemy No. 1 of such hospitals—warrants urgent attention with all the resources at our command. The direct approach is undoubtedly to identify the presence and establish the source of any pathogenic strain of the organism. This, alas, is fraught with technical difficulties these days when it is no longer possible to direct operations under a unified command. In promoting the first local health authority scheme (staphylococcal investigation) for research to be approved under the National Health Service Act I had hoped to get the necessary typing done, but it appears that no laboratory in Scotland can do this. I can only suggest therefore that the work be carried out by the Medical Research Council laboratory services in conjunction with a maternity hospital where accurate control can be exercised over the investigation. I know that there is any amount of clinical material, and the resulting recommendations may well abolish a most distressing condition which is admittedly difficult to treat.—I am, etc.,

Kirkcaldy.

J. W. R. HAY.

Hypnosis in Modern Medicine

SIR,—Professor Alexander Kennedy (*Journal*, June 20, p. 1377) takes me to task for stating, in *Hypnosis in Modern Medicine*, that we should "detensionize the child with hypnosis and the anxiety will fall to pieces." This statement is, of course, taken from its context. What I actually say is: "I have tried to show that tension is the root of most childish ills and I have coined the word *detensionize* to explain this reaction to hypnotic suggestion. Seemingly conflict, repression, and frustration, given the right soil, grow anxiety, which produces tension and finally a neurosis. . . . Detensionize the child with hypnosis and the anxiety will fall to pieces, allowing the physician to re-educate both child and parents. . . ."

Professor Kennedy is upset that "two articles by British contributors . . . do not fairly represent British medicine." May I remind Professor Kennedy that hypnosis has been viewed with suspicion, incredulity, aggression, and emotional bigotry for nearly 200 years by those very physicians who should have led the profession to a knowledge of the subject?—I am, etc.,

Carshalton Beeches, Surrey.

GORDON AMBROSE.

Spiritual Healing

SIR,—I would be grateful for space in which to invite information from medical colleagues with knowledge of patients treated by spiritual healers. By "knowledge" I mean adequate medical case-histories with radiographs and other records before and after treatment.

My search on behalf of the Society for Psychical Research is for documented cases likely to stand up to investigation of the organic state following such "healing." The experience of others in this field would be most helpful in widening the scope of investigation and the reliability of conclusions.—I am, etc.,

45, Wimpole St., London, W.1.

LOUIS ROSE.

POINTS FROM LETTERS

Dental Sepsis

Dr. T. STORDY (Surrey) writes: I should like to make a plea for the patient whom we treat according to modern methods, and would beg the dentist, with the utmost urgency, to remember that there is a patient attached to the tooth, and most grievous general conditions are produced by anything septic in the mouth. X-ray films of teeth cannot be relied upon absolutely. I have carefully observed thousands of dead teeth, teeth filled in all parts of the world, teeth which have had apicectomy performed on them, or have been splinted for periodontitis and passed as being free from infection, but which on extraction showed signs of long-standing subacute inflammation. . . . We have all carried out this treatment and seen the results of our own and others' efforts, in the vast majority of cases to the patient's detriment. In this connexion I very strongly urge the teaching of more general medicine to the dental student, so that he may be able to recognize the signs of sepsis and low resistance to toxins.

Obituary

VICTOR BONNEY, M.D., M.S.,
F.R.C.S., F.R.C.O.G.

We record with regret the death on July 4 of Mr. Victor Bonney at the age of 80. With the late Sir Comyns Berkeley, also of the Middlesex Hospital, he did much to raise the reputation of British gynaecological surgery to its present high position.

Victor Bonney was born in Chelsea on December 17, 1872, the son of Dr. W. A. Bonney, a well-known physician and surgeon. He studied medicine at the Middlesex Hospital, graduating M.B., B.S. in 1896 and proceeding to the degrees of M.D. in 1898 and M.S. in 1899, the year in which he also became a Fellow of the Royal College of Surgeons. To complete this impressive list of degrees and diplomas he became a Member of the Royal College of Physicians in 1900 and took the B.Sc. (anatomy) of London University with first-class honours in 1904. After resident appointments Bonney won the Emden research scholarship in the Cancer Investigation Laboratories of the Middlesex Hospital. His interest in obstetrics and gynaecology was not slow to develop and as early as 1905 he was appointed obstetric tutor, becoming assistant gynaecological surgeon in 1908. When Sir Comyns Berkeley retired in 1930 he succeeded him as senior gynaecological surgeon. Bonney and Berkeley, who were both great teachers, worked together to extend and perfect Wertheim's operation for cancer of the cervix and they were the joint authors of the well-known *Textbook of Gynaecological Surgery*. When the fourth edition of this work was reviewed in this *Journal* in 1943, the author of the review wrote:

"Scattered throughout the British Commonwealth of Nations there is a band of younger men whose privilege it has been to serve an apprenticeship at the Chelsea Hospital for Women, London, where they have become imbued with the Berkeley-Bonney tradition. They are the disciples of the Bonney technique and the Bonney conservatism, and to them, as to many others, Bonney is the greatest living exponent of gynaecological surgery. They remember him as an exquisite surgeon, a stimulating thinker and leader, and a rare and generous teacher."

Bonney's other contributions to the practice and literature of gynaecology were numerous and important, and he devised a number of ingenious instruments. During the first world war he worked as a surgeon at the military branch of the Middlesex Hospital at Clacton-on-Sea. For many years he was on the staff of the Chelsea Hospital for Women, and at one time or another he held appointments at the Royal Masonic Hospital, the Miller General Hospital, Putney Hospital, and Queen Alexandra's Military Hospital. He was also visiting gynaecologist to the Postgraduate Medical School in London. On the council of the Royal College of Sur-



[Lafayette, London]

geons Bonney played a noteworthy part and rose to be a vice-president of the College. He was Hunterian lecturer in 1908, 1930, and 1931, Bradshaw lecturer in 1934, and Hunterian Orator in 1943. The Royal College of Obstetricians and Gynaecologists conferred on him the Honorary Fellowship of the College in 1946. During a visit to Australia he was made Honorary Fellow of the Royal Australasian College of Surgeons, and the Association of Surgeons of Great Britain and Ireland and the American Gynaecological Society in the U.S.A. paid him similar honour. For many years he was a member of the council of the Central Midwives Board, and he examined for the Conjoint Board and several universities. In 1923 he was president of the Section of Obstetrics and Gynaecology at the Annual Meeting of the B.M.A.

Victor Bonney painted and drew with great skill. Not only did he regularly exhibit his paintings at exhibitions of work by medical artists but he illustrated his own books with admirably clear drawings. When he retired he went to live on the banks of the Wye, where he could indulge in another favourite hobby, fishing.

In 1905 he married Annie, daughter of the late Dr. James Appleyard, of Longford, Tasmania.

We are indebted to Sir GORDON GORDON-TAYLOR for the following appreciation:

A friendship of exactly fifty years compels a tribute from a colleague and perhaps condones the venture of a general surgeon to appraise the work of a specialist. In 1903 Victor Bonney returned as gynaecological tutor to the medical school that cradled him, full of enthusiasm, his lectures brimful of references to Teacher's ovum and the views of Targett, Schlagenhauser, and Bland-Sutton on ovarian tumours. It was Bland-Sutton who had directed his footsteps to the Chelsea Hospital for Women, who had turned his gaze towards pelvic surgery, and to whom he always expressed his indebtedness for anything which he himself had achieved. By 1903 he was already on the staff of "Chelsea" and forging ahead as a skilful and intrepid operator. He had already accumulated a plethora of academic degrees and diplomas, but despite the fullness of his days the attraction of a recently created B.Sc. degree in anatomy of the London University made him ready and eager to sacrifice his nights also to attain his ends. I had the immense privilege of working with Bonney for a whole year in the dead of night, when four times a week the two companions toiled through the livelong night, only ceasing at 12.45 a.m. on the other three evenings in the week. Friendships forged in such an environment last as long as life endures. Not only did this year of prodigious toil secure its academic reward, but it also revealed to Bonney that he could draw, and it would be superfluous to refer to the self-drawn illustrations with which he has always adorned his books and scientific communications. The discipline of that year also introduced him to histological methods, which he at once turned to account in his work as Emden Research Scholar in the Middlesex Cancer Laboratories and also in the elucidation of the phenomenon of the implantation of the ovum in cases of tubal gestation, which was engaging his attention. Bonney was quick to recognize that gynaecology and the maieutic art constituted a branch of surgery, and first at "Middlesex" and subsequently in most institutions those who practised the specialty were destined no longer to be "men-midwives" but surgeons with the proud prefix of "Mr." to their name. If Lawson Tait and Bland-Sutton first rescued womankind with their pelvic tumours from the inert, inept "men-midwives" who had previously "treated" their ailments, it was Victor Bonney who became the scintillating ornament of gynaecological surgery.

Bonney was made of such stuff and fibre that he would have excelled in any branch of surgery that his fancy selected. I would not dare to compare the perineal surgery

of one operator with that of another, but I have seen the Wertheim operation performed by gynaecological surgeons throughout the whole world, and among these Bonney stood supreme. He knew every trick of the tool's true play, and had an inventive turn where instruments were concerned: many of the surgical gadgets in use in gynaecological and other operating theatres owe their origin to him. Victor was not content to limit his sphere of surgical activity to the pelvis and had his own views about the treatment of gall-bladder disease, and one of the last operations which he performed only a few months ago was a radical operation for cancer of the breast.

He was the first gynaecologist to secure a seat on the council of the Royal College of Surgeons of England, and served the council for twenty years, and the first of his specialty to become an Honorary Fellow of the Association of Surgeons. The lack of emphasis on surgical training in the requirements for the diplomas of the recently created College of Obstetricians and Gynaecologists aroused his strongest disapproval, and only when years later this defect was remedied would he accept the Honorary Fellowship of that College. He was the first Honorary Fellow of the Royal Australasian College of Surgeons, being admitted to the Fellowship at the same time as Lieutenant-General Sir John Goodwin, then Governor of Queensland (1928).

Victor was a man of intense kindness, and his quaint address of endearment, though perhaps not advancing his promotion in the councils of men, nevertheless revealed the heart of gold that beat within his breast. His loyalty to colleagues was one that "passeth all understanding," and the memory still remains with me of an enthusiast who half a century ago prepared the specimens, the paraffin blocks, employed the histological stains, wrote most of the paper or book, made the drawings, while the contribution of his co-author was confined to turning the handle of the microtome. Yet he went his smiling way, nor did any rancour impair the lightness of his step. His married life, which lasted nigh on fifty years, was one of great happiness, and to the end of his life he remained the same devoted lover as he was fifty years ago in his courting days, when every morning he wrote a note to his fiancée and scampered across the hospital quadrangle from our dissecting room to catch the 3 a.m. post which existed in that far-distant period. To the writer of this tribute he was a great master surgeon and a loyal friend.

EWEN A. JACK, O.B.E., Ch.M., F.R.C.S.Ed.

Mr. Ewen A. Jack, lecturer in orthopaedic surgery at Edinburgh University and consultant orthopaedic surgeon for the South-Eastern Region of Scotland, died at his home in Edinburgh on June 28 at the early age of 44.

Ewen Alistair Jack was born on January 31, 1909, at Hartlepool, where his father was in general practice, and was educated at Fettes College. On leaving school he studied medicine at the University of Edinburgh, where he distinguished himself as an athlete, being captain of the University Rugby fifteen. While at the University he lived in Ramsay Lodge, and there must be many Ramsay men the world over who will mourn the loss of their old friend, cut off at the peak of his career.

Ewen Jack graduated M.B., Ch.B. in 1932, and after a series of house appointments in Edinburgh and Leicester became a Fellow of the Royal College of Surgeons of Edinburgh in 1935. A period of post-graduate training in London followed, and he then returned to Edinburgh as clinical tutor in surgery at the Royal Infirmary, an appointment he continued to hold till the outbreak of war in 1939, when he entered the R.A.M.C. Up till then Jack's aim had been to secure a sound general training in surgery, and it was on this that he rapidly built up experience in his chosen specialty of orthopaedics.

He had a distinguished career in the Army, serving with the British Expeditionary, Middle East, and Central Mediterranean Forces, both as an orthopaedic specialist in charge of a large orthopaedic centre in Cairo and as the officer in charge of a field surgical unit in Sicily and Italy. He was then promoted lieutenant-colonel with charge of the surgical division of a general hospital in north-west Europe, where he served till demobilization. He was appointed O.B.E. in 1944 in recognition of gallant and distinguished services in Sicily, and in the following year he was mentioned in dispatches for his services in north-west Europe. It was while serving with No. 9 General Hospital in France in 1940 that he met his wife, formerly Miss Vivien Weekes, and they were married in Cairo early in the following year.

Edinburgh was indeed fortunate that he chose to settle down in his old school after the war. He played a notable part in the formation of an orthopaedic scheme for the area and was instrumental in its success. It was typical of his drive and determination that in the midst of this exceptionally busy time he obtained the higher degree of Ch.M. in 1948. His skill and ability as a teacher and as a surgeon were known not only to the students in Edinburgh but to a far wider circle, as was evident at the joint meeting of the Orthopaedic Associations of the English-speaking World in London last year. It was characteristic of him that his interests were not confined to a limited sphere but to the advancement of orthopaedic surgery in general. He was an indefatigable worker and had an uncanny ability to strip a problem of its non-essentials, having a keen eye for the basic facts. He made several important contributions to the literature of his specialty, and his many friends will not be surprised to learn that when even his stout heart could not drive his broken body to the physical effort of attending to his patients he was still actively engaged in the preparation of another paper, which, alas, he was not to be allowed to finish.

Ewen Jack was a big man, physically and in every other way. Those who knew him well and worked with him entertained a tremendous respect for his judgment and a high regard for him as a companion. Any of his gifts would have brought a man honour, respect, and admiration, but he had an even greater gift, and that was personal courage. A few months ago he knew that his end was near, but there was never any suggestion of limiting his activities. Indeed, he worked under a terrific physical burden till three weeks before his death. Those who knew of Ewen Jack's end realized that here was a man who set a fine example of how to die nobly. He died at home within sight of the beautiful garden of which he was so proud and which he had been allowed to enjoy for such a short time. No man could have been better nursed than he was by his wife. Her courage and devotion were an inspiration to all who were privileged to be with him during his last illness. To her and to his two young children goes our deepest sympathy.—J. H. C. and W. M.

OSWALD MARRIOTT, M.D., M.R.C.P.

Dr. Oswald Marriott, well known in Hong Kong and in London, died on June 17 at the age of 79.

Oswald Marriott was born on December 30, 1873. From Dulwich College he went to Guy's Hospital to study medicine, qualifying in 1900. After resident appointments at Guy's and the Dreadnought Hospital, Greenwich, he continued his medical education in Vienna and Brussels and at the London School of

Tropical Medicine. He took the M.D. of Brussels University and then graduated M.B., B.S. at London University in 1908, proceeding M.D. (tropical medicine) in the same year. Shortly before this he had gone out to Hong Kong as a member of the firm of medical practitioners which had included among its members Dr. (later Sir) Patrick Manson and Dr. (later Sir) James Cantlie. From 1905 to 1923 he served as a surgeon to the Chinese Maritime Customs. A keen member of the council and senate of Hong Kong University, he lectured there on materia medica and therapeutics. His practice was a large and busy one, for he put his work and his patients in front of everything else. All his work was run on strictly business-like lines, and every minute was accounted for. He took a great interest in the local Branch of the B.M.A. and was for a time its indefatigable secretary. He was in the R.A.M.C. for a short time towards the end of the first world war.

After Marriott returned to England in the early nineteen-twenties he built up a consulting practice in the City of London, specializing in tropical diseases. In 1923 he took the M.R.C.P. He maintained his early interest in the affairs of the B.M.A. and was a member of Council for many years, besides serving on a number of committees and as a Representative at Annual Meetings.

We are indebted to Mr. W. SAMPSON HANDLEY for the following appreciation: The passing of Oswald Marriott severs a link of friendship which dates unclouded from the dim past of 1895. At that time he was one of the ward clerks on the firm of the late Mr. Clement Lucas, to whom Sir Arbuthnot Lane was assistant surgeon and I was house-surgeon. I recall delightful visits to Marriott's home at Forest Hill, an old manor house with gardens and orchards even then embedded in a mass of small villas.

After house-surgeons at Guy's and the Seamen's Hospital, Greenwich, Marriott went to Hong Kong as a member of the distinguished firm to which the late Sir Patrick Manson belonged, and henceforth his interests were mainly in tropical medicine. After a long and successful career in Hong Kong he returned to England, and until a few months before his death practised as a tropical and insurance consultant in the City, the trusted adviser of many important firms with tropical interests. He leaves a widow, two sons, and a grandson to mourn his loss, and his friends the world over will share their feelings. In him modesty was allied with high competence, unswerving loyalty to his ideals and his friends, and lifelong devotion to the demands of his profession.

ARTHUR MARTIN-LEAKE, V.C. and Clasp, F.R.C.S.

Dr. ERNEST JONES writes: The following recollection illustrates one of Martin-Leake's most prominent attributes—his modesty. He was not the first University College Hospital doctor to win a V.C. in the South African war, but when we desired to honour him in the same fashion as we had his predecessor, who was given a banquet with Dr. G. V. Poore in the chair, he firmly declined. He had "only done his duty," and he abhorred any fuss being made about it. How high his conception of "only doing his duty" was he showed in the first world war by winning a V.C. again in heroic circumstances.

We record with regret the death of Mr. J. R. LEE on March 29 at the age of 79. Before his retirement he was senior honorary surgeon at the Battersea General Hospital. John Robert Lee was born in Australia on July 17, 1873, and was educated at Grenville College, Ballarat, and Melbourne University, where he graduated M.B., B.S. in 1898. During the next few years he engaged in surgical experience, obtaining the F.R.C.S. of Edinburgh in 1906 and proceeding to the degree of M.D. in 1908. Among the appointments he held was that of surgeon to out-patients in the

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Alfred Hospital, Melbourne. Lee was a captain in the Royal Australian Army Medical Corps from 1901 to 1915, and during the first world war he served in the R.A.M.C., attaining the rank of major, and being appointed O.B.E. for his services. After the war he settled in London, taking the F.R.C.S. of England in 1923. During the last war he served as a surgical specialist in the E.M.S. A paper in which he described his experiences in the reception and treatment of air-raid casualties was published in this *Journal* in 1941.

We are indebted to Mr. JOHN SOPHIAN for the following appreciation: The recent death of John Robert Lee has brought to a close a life that was lived unselfishly. He had been spared to a ripe old age, and even in his later years his zeal in his task remained largely unabated. There are several among the ranks of consultants who will remember him with deep gratitude. Not only did he help to provide them with professional opportunity, but he fostered and guided them with kindness, wisdom, and encouragement while their maturity was being attained. Particularly will he be remembered by the poor of Battersea. For he came to the rescue and identified himself with the then Anti-Vivisection Hospital (now the Battersea General Hospital) when at the lowest ebb of its fortunes. Those who had witnessed its rapid rise to prominence thereafter equally well knew that such success was due to his devoted exertions. On many an occasion have I heard the warm appreciation of the local sick for his efforts in having established a medical sanctuary in what had been an area bereft of such aid. The poverty of the locality had restricted professional help, and the hopelessness of families faced with illness was by his wisdom and planning greatly relieved. The last decade and a half, because of the intervention of the war and a reorientation of the social system, has tended to obliterate from memory these signal services of rescue and of help.

Lee was highly qualified and was an excellent surgeon in every sense of the word. When carrying the burden of the hospital on his own shoulders, obstetrics and gynaecology had to be included in his efforts—a task in which he manfully acquitted himself. But it was as a general surgeon that he chiefly showed his skill. His was no narrow specialization, and his intrepidity carried him successfully into every anatomical region. Even towards the end of his career his approach was characterized by sound judgment and his execution by good technique. However, it was as a good man that he will long be remembered by those privileged to have known him. He was always guided by high Christian principles, and he lived his life by these ideals. In one very human moment, which I vividly recall, he confided to me how he used to undertake the long and arduous journey by car from home to hospital during the heaviest blitz singing hymns all the way. Though his career may not have been exceptional, his memory will long be cherished, and the good he effected will ever be a monument in the hearts of the many he so unselfishly assisted. His wife predeceased him by a few years. Our sympathy goes out to his only daughter.

The sudden and unexpected death from coronary thrombosis of Dr. D. H. McDOWELL at the early age of 41 is a tragic loss to his family, his friends, and to the Three Counties Hospital at Arlesey, Bedfordshire, which he served so well. Daniel Henry McDowell was born on July 7, 1911, and received his medical education at Dublin, where he took the diplomas of L.R.C.P. & S.I. in 1935. After holding an appointment at the County Infirmary, Armagh, he was medical superintendent of a mission hospital at Kirin, in Manchuria, from 1937 to 1941, when he went to Australia. After practising in various places in the State of Victoria, he returned to Northern Ireland in 1945, and two years later he was appointed to the staff of the Three Counties Hospital. In 1948 he obtained the D.P.M. of the British Royal College.

N. McD. writes: Dan McDowell will be remembered with real affection by all who knew him, and by none more so than the patients and staff of the Three Counties

Hospital. Equipped with high ideals and a pleasant personality and with a quiet sense of humour, no one could wish for a more reliable or more agreeable colleague. He was more than fortunate in his married life, and our sympathy goes out to his widow and three children.

Medical Notes in Parliament

TRUTH IN ADVERTISING

Mr. PETER THORNEYCROFT on June 26 moved the second reading of the Merchandise Marks Bill, which had already passed the House of Lords. He said the effect of existing legislation was that if a trader elected to describe his goods he must not describe them falsely. The Bill widened the definition of trade descriptions to include misleading descriptions.

Dr. BARNET STROSS seconded an amendment for the rejection of the Bill. He said that in the "plugging" of things like deodorants and chlorophyll toothpaste the technique used was to make the young people and women frightened that they would become social outcasts and believe that their armpits and mouths were objectionable. Everyone associated with medicine knew that chlorophyll did not take away bad smells at all. He looked forward to seeing these people change the quality of their advertisements. The least critical of the people were subjected to advertisements of a most misleading type. One knew of advertisements of rejuvenation cures which no reputable newspaper would accept to-day and of so-called cures for incurable diseases. Such advertisers always selected psoriasis as a subject for advertising because they knew that it was not curable by any available means, but was always likely to appear to get better for a while.

Miss ELAINE BURTON said that in 1950 she had asked a Parliamentary Secretary if he was aware that the American public had the choice of 65 different kinds of aspirin which were advertised as various qualities. Some were pure, some were certified, some dissolved fast. One was advertised as giving quicker relief because it dissolved more speedily in water. It was found upon testing that the speed with which an aspirin dissolved in water was no indication of the speed with which it was absorbed into the system. It was also found that there was no relationship between the speed with which it was absorbed into the system and the speed with which it cured headache. If in this country we had advertisements of aspirins like those in America she presumed that the manufacturers or advertisers would be obliged to prove their case or they would be guilty under this Bill.

Mr. JAMES HUDSON drew attention to medicated wines. These things were sold to poor women on the assumption that what they needed was medicine. The quantity of nutritive matter contained in many of these beverages was negligible.

Mr. HENRY STRAUSS, replying for the Government, said that many of the matters that had been quoted by Dr. STROSS were not trade descriptions and could not, in his opinion, be proved to be false.

The Bill was read a second time without a division.

MERGING OF MINISTRIES

On June 30 Mr. HARRY CROOKSHANK moved for the approval of a Draft Order to merge the Ministry of Pensions and the Ministry of National Insurance. He said that in 1921 there were 67 Ministry of Pensions hospitals. To-day there were only eight. There had been a marked decline in the use by war pensioners of the special hospital and treatment services of the Ministry of Pensions, which had been replaced by the National Health Service. The National Health Service had come into being for all classes of medical treatment, and the Ministry of National Insurance

did work for the industrially disabled similar to that done for the war disabled by the Ministry of Pensions. There was already a considerable link in case-work between the two departments.

Mr. GEORGE ISAACS hoped that the new Ministry, if it was established, would carry on the specialized services of Roehampton or Queen Mary's Hospital. There was another specialist centre at Stoke Mandeville which had been developed by the Ministry of Pensions and now was at the service of civilians. Miracles could be seen there. He asked for an assurance about continuation of the welfare services.

After further debate the proposed merger was approved by 226 to 212.

Priority for War Pensioners

A motion approving the Transfer of Functions (Ministry of Pensions) Order was moved in the House of Lords on July 2 by LORD SELKIRK. He said the organizational changes would take place gradually. The preferential position of war pensioners and existing priorities in regard to medical treatment would be preserved. War disabled would receive priority in the existing pensions hospitals and in all National Health Service hospitals. Treatment at clinics would be discussed with ex-Service organizations. Ex-Service interests would be represented in the management of pensions hospitals. There would be no changes in Queen Mary's Hospital, Roehampton, without full consultation with its governors.

After debate the House agreed to the motion.

Providing for Old Age

Mr. R. A. BUTLER on July 2 told the House of Commons that the Government had decided to set up an independent committee to review the economic and financial problems involved in providing for old age, having regard to the prospective increase in the number of the aged. He said the number of men and women over the ages of 65 and 60 was expected to rise from nearly 7 million in 1952 to nearly 10 million in 1977, a rise of more than 40%. In the same period the number between the age of 15 and these pensionable ages was expected to decline. Sir Thomas W. Phillips had agreed to serve as chairman of this committee. A first report was expected shortly from the Ministry of Labour Advisory Committee on the Employment of Older Workers.

Sewage in Rivers—While it is true that some tidal river estuaries are polluted by the discharge of sewage, Mr. Macmillan has no evidence of any danger to public health.

Extensions at Mental Hospitals.—Mr. Macleod hopes to make a special allocation available next year for extensions at suitable mental deficiency and mental hospitals. He has circulated to boards sketch plans to assist them in framing proposals.

Calcium.—One pint of milk (0.57 l.) supplies 680 mg. calcium; 1 lb. (0.45 kg.) of bread, containing added calcium carbonate, 649 mg.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF ENGLAND

On July 2 Professor Lambert C. Rogers was re-elected and Professor Ian Aird, Professor R. Milnes Walker, and Professor C. A. Wells were elected members of the Council of the College. The result of the poll was as follows:

	Elected					Votes				
Lambert Charles Rogers, V.R.D. (Royal Infirmary, Cardiff)										1,206
Ian Aird (Postgraduate Medical School of London)										788
Robert Milnes Walker (Royal Infirmary, Bristol)										684
Charles Alexander Wells (Royal Infirmary, Liverpool)										640

In all 1,993 Fellows voted; in addition 22 votes were found to be invalid.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending June 20 (No. 24) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	25	1	10	1		19	1	12	2	3
Dysentery ..	557	79	171	2	1	188	23	59	56	
Encephalitis, acute	9	1	0	0		5	0	0	0	
Enteric fever: Typhoid ..	0	0	1	0		4	0	2(B)	0	3
Paratyphoid ..	23	1	2(B)	0		32	0		1	
Food-poisoning ..	998	16		1		116	7		2	
Infective enteritis or diarrhoea under 2 years ..				8	24				22	27
Measles* ..	7,580	291	371	233	210	7,307	745	332	210	246
Meningococcal infection ..	27	2	21	1		40	2	12	0	3
Ophthalmia neonatorum ..	37	3	12	1		31	5	9	0	
Pneumonia† ..	370	12	159	6		427	18	170	4	
Poliomyelitis, acute: Paralytic ..	44	3				28	0			
Non-paralytic ..	21	1	4	5	2	20	0		9	4
Puerperal fever‡ ..	261	35	15	2		210	32	2	1	1
Scarlet fever ..	1,223	92	193	37	64	845	72	215	12	60
Tuberculosis: Respiratory ..			164	30				151	39	
Non-respiratory ..			40	5				35	5	
Whooping-cough ..	4,104	344	530	61	113	2,513	106	176	74	100

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0		0	0	0		0	0
Dysentery ..	1	1				0	0		0	
Encephalitis, acute	0					0				0
Enteric fever ..	0	0	0			0	0		0	
Infective enteritis or diarrhoea under 2 years ..	6	0	0	0	1	16		2	0	1
Influenza ..	8	0	0	0	0	4	1		0	0
Measles ..		0	0		0		0		0	0
Meningococcal infection ..		0	0				2			
Pneumonia ..	148	20	19	6	4	129	21		10	3
Poliomyelitis, acute	2	0			1	2	0			0
Scarlet fever ..		0	0		0		0		0	0
Tuberculosis: Respiratory ..	7	11	7	3	8	91	8	10	0	6
Non-respiratory ..	0	0	3	1	0	1	3	2	2	
Whooping-cough ..	4	0	0	0	0	3	1		0	0
Deaths 0-1 year ..	212	17	27	9	14	219	24	38	5	9
Deaths (excluding stillbirths) ..	4,447	596	529	92	127	4,587	643	523	96	131
LIVE BIRTHS ..	8,026	1236	937	230	362	7,973	1219	936	230	411
STILLBIRTHS ..	221	29	19			190	22	25		

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

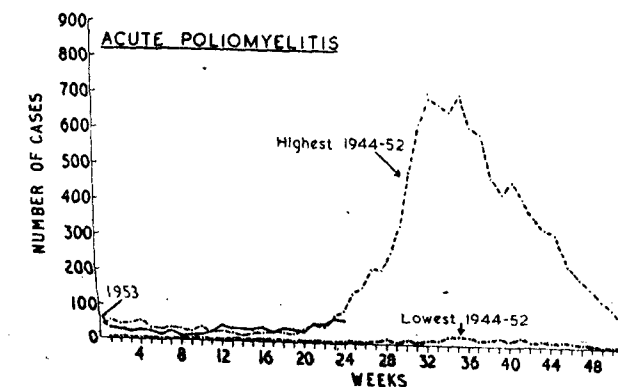
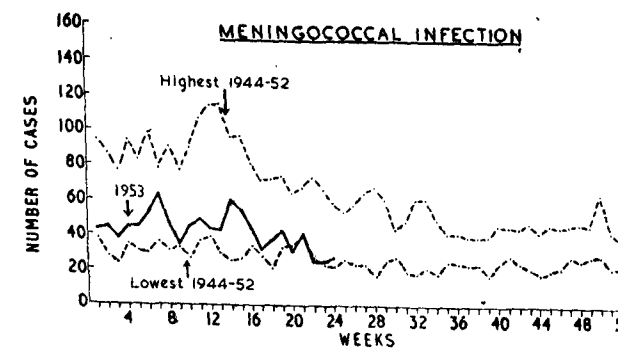
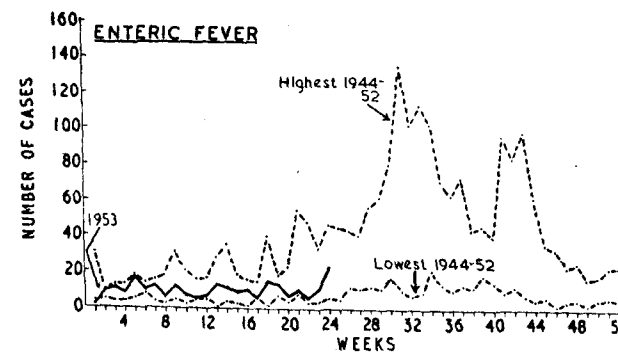
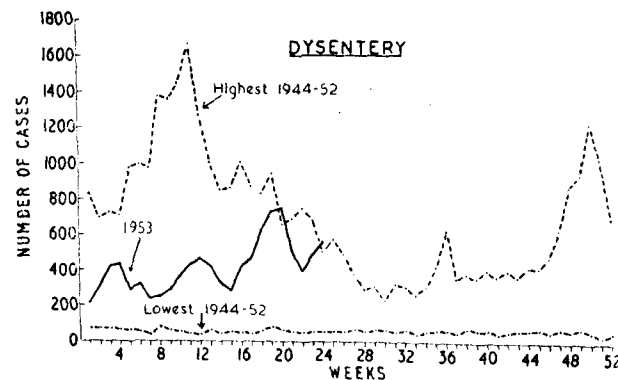
† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The incidence of infectious diseases in England and Wales during the week ending June 20 increased slightly. The largest rises in notifications were 559 for whooping-cough, from 3,545 to 4,104; 168 for scarlet fever, from 1,055 to 1,223; 71 for dysentery, from 486 to 557; and 48 for measles, from 7,532 to 7,580.

The largest rises for whooping-cough were Essex 79, from 249 to 328, and Warwickshire 65, from 207 to 272. Only small fluctuations occurred in the local trends of scarlet fever. 25 cases of diphtheria were notified during the week, 8 more than in the preceding week. The rise in diphtheria was due to cases scattered throughout the country. The largest increases in the incidence of measles were Yorkshire East Riding 118, from 178 to 296; Lancashire 113, from 1,438 to 1,551; and London 84, from 207 to 291; while the largest declines were Yorkshire West Riding 139, from 843 to 704; Gloucestershire 70, from 386 to 316; and Cornwall 68, from 209 to 141.

23 cases of paratyphoid fever were notified, 18 more than in the preceding week, and this was the largest total for 36 weeks. The rise was due to sporadic cases over a wide area.

The 65 cases of acute poliomyelitis were 7 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. The largest returns were Kent 6, Essex 6 (West Ham C.B. 2), London 4, Middlesex 4, and Somerset 4.

The largest returns for dysentery were Lancashire 93 (Preston C.B. 27, Liverpool C.B. 21), London 79 (Islington 12), Bedfordshire 66 (Luton M.B. 59), Middlesex 50 (Edmonton M.B. 16, Willesden M.B. 12), Yorkshire West Riding 43 (Barnsley C.B. 16), Surrey 37 (Dorking and Horley R.D. 10), Leicestershire 28 (Leicester C.B. 24), and Essex 21.

Of the 998 cases of food-poisoning, 860 were notified in Lancashire. Food-poisoning was notified from 37 administrative areas of Lancashire.

Quarterly Return for Scotland

The birth rate during the first quarter of 1953 was 18.1 per 1,000 of the population and was 0.1 above the rate for the first quarter of 1952 but 0.7 below the average of the five preceding first quarters. The infant mortality rate was 34 per 1,000 registered live births; this was the lowest rate ever recorded in a first quarter, being 4 below the rate for the March quarter of 1952.

The general death rate was 13.7 per 1,000 of the population and was 0.8 below the rate for the corresponding quarter of 1952 and 1.3 below the five-years average. 219 deaths were registered from the principal epidemic diseases. These included 186 from influenza, 13 from measles, 12 from meningococcal infections, and 4 from whooping-cough. The death rate from all forms of tuberculosis was 32 per 100,000 (27 from respiratory tuberculosis); these rates were 15 and 14 respectively below those for the first quarter of 1952, and were 33 and 30 below the five-years average. Deaths from violence numbered 737, including 130 attributed to road transport, as compared with 643 and 86 in the first quarter of 1952.

Week Ending June 27

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,333, whooping-cough 4,116, diphtheria 18, measles 6,871, acute poliomyelitis 60, dysentery 676, paratyphoid fever 5, typhoid fever 4.

The Services

Major-General C. W. Greenway, C.B.E., late R.A.M.C., has been appointed Honorary Surgeon to the Queen, in succession to Major-General F. R. H. Mollan, C.B., O.B.E., M.C., late R.A.M.C., retired.

Brigadier A. E. Campbell, late R.A.M.C., has been appointed Honorary Physician to the Queen, in succession to Major-General T. Young, C.B., O.B.E., late R.A.M.C., who has retired.

Medical News

Queen's Honorary Physicians.—The following were gazetted as Honorary Physicians to the Queen for three years from July 1: Dr. G. E. Godber, deputy chief medical officer, Ministry of Health; Sir Harold Himsworth, secretary, Medical Research Council; Dr. H. L. Glyn Hughes, senior administrative medical officer, South-East Metropolitan Regional Hospital Board; Dr. J. M. Hunter, medical adviser to the General Health Services Board for Northern Ireland; Dr. E. K. Macdonald, medical officer of health and school medical officer, City of Leicester; and Dr. R. J. Peters, deputy chief medical officer, Department of Health for Scotland.

Fifth Birthday of the Health Service.—The Minister of Health and the Secretary of State for Scotland have each marked the fifth anniversary of the start of the National Health Service on July 5, 1948, by sending grateful messages to those who administer the Service. Mr. Iain Macleod speaks of the "great and remarkable tradition of this country to rely for local administration on the selfless voluntary work of thousands of men and women": "on the continuance of this work," he declares, "the National Health Service must inevitably depend." Mr. James Stuart pays a similar tribute to the "unpaid voluntary workers" who carry so much of the burden of planning and running the Service. Looking back, Mr. Stuart is able to say that the "essential services of medicine have been brought more fully within the reach of the whole population of Scotland than ever before." What do the figures tell us? In England and Wales there are now 470,000 staffed hospital beds in the N.H.S., an increase of 35,000 since the appointed day; there are 142,000 whole-time nurses and 27,000 part-time, increases respectively of 27,000 and 10,000; over 10 million dentures and 27 million pairs of spectacles have been supplied. In Scotland, the establishment of staffed beds is now 61,400; whole-time nurses number 19,000, part-time 3,400; nearly 2 million dentures and nearly 3 million pairs of spectacles have been provided.

Rockefeller Institute for Medical Research.—A New York report states that Dr. Detlev W. Bronk, the distinguished American neurophysiologist, has been nominated as director of the Rockefeller Institute for Medical Research, in succession to Dr. Herbert S. Gasser. Dr. Bronk, who was born in New York in 1897, is both an able research worker and an experienced administrator: for ten years he directed the Institute of Neurology at Pennsylvania University; during the war he was co-ordinator of research at the Air Surgeon's Office of the U.S. Army Air Forces; and after the war he was appointed chairman of the National Research Council. In 1949 Dr. Bronk was elected president of Johns Hopkins University. This experience is likely to be specially valuable, as there are to be changes in the direction of the Rockefeller Institute which will mean greater administrative responsibility for the new director.

Benefits for Occupational Diseases.—The Minister of National Insurance has appointed a committee under the chairmanship of Mr. F. W. Beney, Q.C., to review the present provisions of the Industrial Injuries Act under which benefit is paid for diseases and for personal injuries not caused by accident. The medical members of the committee are Sir Ernest Rock Carling, Dr. L. G. Norman, and Dr. Alice Stewart. The inquiry is concerned with the extent to which persons who claim they are suffering from diseases due to their employment should be eligible for the special benefits of the industrial injuries scheme. At the moment, apart from the "injury by accident" provisions, cover is given only for certain specified occupational diseases, at present numbering 40. The committee invites written evidence, which should be sent to the committee's secretary, Mr. H. B. Lewin, Ministry of National Insurance, 10, John Adam Street, London, W.C.2.

Royal Patronage for Chartered Society of Physiotherapy.—The Queen has granted her patronage to the Chartered Society of Physiotherapy. The society has been under royal patronage since the grant of its charter in 1920, when the late Queen Mary became its patron.

Professor Wilder G. Penfield, O.M., was one of the five former Rhodes Scholars to be given the honorary degree of D.C.L. at the Rhodes Centenary Celebrations at Oxford last week. Dr. Penfield is director of the Montreal Neurological Institute and professor of neurosurgery at McGill University.

Honorary Degrees at Edinburgh.—On July 3 the honorary degree of LL.D. was conferred on Dr. S. L. A. Manuwa, Inspector-General of Medical Services, Nigeria, and on Professor Charles McNeil, professor emeritus of child life and health in the University of Edinburgh.

William Marsden Travelling Professorship.—The Board of Governors of the Royal Free Hospital has awarded the 1953 William Marsden Travelling Professorship to Dr. Ernest T. D. Fletcher. He will attend the eighth International Congress for Rheumatic Diseases at Geneva, and then visit various rheumatism research centres in Italy and Spain, returning via Paris, Copenhagen, Stockholm, Malmo, and Lund. After this he will go to America, where he will visit hospitals in Canada and the United States.

Dr. H. C. Maurice Williams, medical officer of health to the county borough and port of Southampton, has been elected chairman of council of the Royal Sanitary Institute from October 1, 1953. Dr. Williams is a past president of the Society of Medical Officers of Health, and the honorary secretary of the Association of Sea and Air Port Health Authorities.

Dr. Louis Findlay, who graduated from Aberdeen University in 1936, has been appointed chief of the Health Division of the United Nations Relief and Works Agency for Palestine Refugees. Dr. Findlay's last post was that of medical consultant to the United Nations Korean Reconstruction Agency.

Dr. N. E. Waterfield has been gazetted as a Deputy Lieutenant of Surrey.

Thoracic Surgery.—Georg Thieme Verlag, Stuttgart, have commenced publication of *Thoraxchirurgie*, which will appear every two to three months and will publish papers on the pathology and surgery of pulmonary and cardiac disease. Subscription per volume of six parts is DM.60.

COMING EVENTS

British Diabetic Association.—The Annual Scientific Meeting of the British Diabetic Association will be held in the Littlewood Hall of Leeds General Infirmary on July 17 and 18. The meeting will commence with the 1953 Banting Memorial Lecture, to be given by Professor R. E. Tunbridge, whose subject will be "Socio-medical Aspects of Diabetes Mellitus." There will also be discussions on clinical experiences with new forms of insulin, and on various other topics. Accommodation may be obtained on request to the Warden of Lyddon, Virginia Road, Leeds, 2.

Postgraduate Paediatrics Symposium.—Paediatrics is the subject of the next of the monthly symposia for postgraduate students organized by the Cambridge University Medical School. The symposium will be held at Addenbrooke's Hospital, Cambridge, at 10.30 a.m. on July 18, and will comprise lecture-discussions and clinical demonstrations. Those wishing to attend the symposium are asked to notify the secretary, Cambridge University Medical School, Tennis Court Road, Cambridge, as soon as possible.

Norfolk Branch Dance.—The Norfolk Branch of the British Medical Association will hold a dinner-dance at the Samson and Hercules Ballroom, Norwich, on September 30. Invitation cards will be sent out later.

British Social Biology Council.—The Summer School of the British Social Biology Council is being held at Aix-en-Provence from August 6 to 20. The theme of the school is "Nature and Nurture." The principal speakers will be Mr. Alec Rodger and Dr. C. O. Carter. The cost of the school is £34, which includes registration, tuition, accommodation, and second-class travel. Those requiring further information should communicate as early as possible with the secretary, British Social Biology Council, Tavistock House South, Tavistock Square, London, W.C.1.

Davidson Clinic Summer School.—The Summer School of the Davidson Clinic for medical psychotherapy will be held in Edinburgh from July 29 to August 4. Further details may be obtained from the secretary of the Clinic, 58, Dalkeith Road, Edinburgh, 9.

Oesophageal Speech.—An institute on teaching and improving oesophageal speech will be held in Cleveland, Ohio, from August 10 to 16. This institute, the second to be held on voice pathology, is being sponsored by the American Cancer Society and other bodies. Surgeons and speech therapists will lecture and demonstrate the teaching of oesophageal speech, and non-speaking laryngectomized persons may attend the institute without charge. Anyone wishing for further details should write to Dr. Warren H. Gardner, 11,206, Euclid Avenue, Cleveland, 6, Ohio.

The Eighth International Congress of Rheumatic Diseases will be held in Geneva from August 24 to 28, 1953. The president is Professor E. Jarlov, of Copenhagen. Those wishing for further information are asked to communicate with Professor K. M. Walthard, Institut de Physiatrie, Hôpital Cantonal, Geneva.

The Second International Congress of Cardiology will be held in Washington, D.C., U.S.A., from September 12 to 15, 1954. Further details will be available later, but all correspondence should be sent to the secretary-general, Dr. L. W. Gorham, 44, East 23rd Street, New York 10.

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 37, No. 7) will be available in a week's time. The contents include:

DEGENERATION OF THE DOG RETINA. I: STRUCTURE AND DEVELOPMENT OF THE RETINA OF THE NORMAL DOG. H. B. Parry.
AN EYE SANATORIUM: SURVEY OF ONE YEAR'S WORK. D. P. Choyce and A. G. Cross.
MODIFICATION AND DEFENCE OF THE SCLERAL IMPLANT. W. Hedley Summerskill.
THE RIDLEY INTRA-OCULAR ACRYLIC LENS. A SIMPLIFIED OPERATIVE TECHNIQUE. V. P. Patel.
FLICKER STIMULATION IN AMBLYOPIA. G. Parsons-Smith.
SECONDARY GLAUCOMA DUE TO SPONTANEOUS RUPTURE OF THE LENS CAPSULE. F. S. Hubbertsey and J. S. Gourlay.
THE MEASUREMENT OF CORNEAL THICKNESS AND ITS APPLICATION TO KERATOPLASTY. A. Lister, A. S. Philips, and M. Langham.
A SPEED-OF-PERCEPTION MEASUREMENT APPARATUS. J. C. Neely.
VENOUS PRESSURE AND OCULAR TENSION. DATA CONCERNING THE DIURNAL VARIATION OF OCULAR TENSION. P. Weinstein and J. Forgacs.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Tuesday, July 14

INSTITUTE OF NEUROLOGY.—5 p.m., Dr. L. Cox (Melbourne): Disorders of Consciousness from Basal Lesions of the Brain.

Thursday, July 16

LEEDS UNIVERSITY.—At General Infirmary at Leeds, 4.15 p.m., Dr. L. B. Cox (Melbourne): Torulosis.

Friday, July 17

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, Bute Medical Buildings, St. Andrews, Fife, 11 a.m., 320th meeting. Scientific papers will be read.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Charles Tomes Lecture by Mr. G. T. Hankey: Temporo-mandibular Arthritis.

APPOINTMENTS

DAVIES, ILID META LEWIS, M.B., B.Ch., D.Obst.R.C.O.G., Assistant Medical Officer, South-east Glamorgan Health Division.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—A. H. Millard, F.R.C.S., Surgical Registrar; M. R. Williams, F.R.C.S., Part-time Surgical Registrar; K. Till, M.B., B.Ch., Clinical Assistant to the Neurosurgical Department; N. T. Jacob, B.M., B.Ch., M.R.C.P., D.C.H., Assistant Medical Registrar; Elizabeth A. Martin, M.B., B.S., and T. J. Haywood, M.D., House-physicians; H. B. Eckstein, M.B., B.Ch., and J. A. Wilkinson, M.B., B.Ch., House-surgeons.

JENKINS, DAVID HUGHES, M.S., F.R.C.S., Consultant Surgeon, United Cardiff Hospitals and Welsh Regional Hospital Board.

RICHARDS, R. D., M.B., B.Ch., F.R.C.S., Consultant Surgeon, Royal Gwent Hospital, Newport, Mon.

SLEIGH, J., M.B., Ch.B., D.P.H., Divisional Medical Health Officer, Nova Scotia Provincial Government.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—D. Finn, M.B., B.Ch., Assistant Psychiatrist at Horton Road and Coney Hill Hospitals, Gloucester; R. M. M. Hunter, M.B., Ch.B., M.R.C.P.Ed., D.P.H., D.P.M., Consultant Psychiatrist to North Gloucestershire Clinical Area; C. D. Linton, M.B., Ch.B., D.Obst.R.C.O.G., Anaesthetic Registrar, Southmead Hospital, Bristol; W. L. Walker, M.B., Ch.B., D.P.H., D.P.M., Senior Registrar in Mental Deficiency and Child Psychiatry to Bristol Clinical Area; S. Schwartz, M.B., Ch.B., F.R.C.S.Ed., Orthopaedic Registrar, Winford Orthopaedic Hospital, near Bristol; T. Galla, M.B., Ch.B., Registrar in Psychiatry to South-western Region; R. H. Ellis, M.D., M.R.C.P., Consultant Chest Physician to North Gloucestershire Clinical Area; J. M. Whelchan, L.R.C.P.&S.I., Assistant Psychiatrist, Roundway Hospital, Devizes.

UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES.—J. B. Self, M.B., Ch.B., F.R.C.S., Surgical Registrar; J. H. M. Pinkerton, M.D., M.R.C.O.G., Senior Lecturer in Obstetrics and Gynaecology; Joyce Ford-Smith, M.B., Ch.B., D.Obst.R.C.O.G., Lecturer in Obstetrics and Gynaecology; R. A. St. C. Hoyte, M.D., C.M., D.Obst.R.C.O.G., Registrar in Obstetrics and Gynaecology.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Flucker.—On June 25, 1953, at Plymouth, to Christine, wife of Dr. J. L. Flucker, a daughter—Christine Louise.

Robinson.—On June 24, 1953, at Old Court Clinic, Ealing, London, W., to Gay (formerly Selig), wife of Dr. Keith J. Robinson, of 12, Presto Hill, Kenton, Middlesex, a son—Martin Clifford.

Shotts.—On June 28, 1953, at the West Middlesex Hospital, Isleworth, to Barbara (formerly Layman), wife of Alan Shotts, M.R.C.S., L.R.C.P., L.D.S., a son—Paul David.

Stock.—On June 27, 1953, at St. Mary's Hospital, Portsmouth, to Freda (formerly Lunt), M.B., D.C.H., wife of Dr. S. D. Stock, of 20, Magdala Road, Cosham, Hants, a daughter—Lexley Freda.

Thomas.—On June 30, 1953, at the Radcliffe Infirmary, Oxford, to Katie (formerly Walker), wife of F. Brian Thomas, F.R.C.S., Putson Manor, Hereford, a daughter.

MARRIAGES

Shirlaw—Davidson.—On July 1, 1953, at St. Andrew's Church, Waterloo, Liverpool, Herbert Anthony Douglas Shirlaw, M.B., Ch.B., Flight-Lieutenant, R.A.F., of Upholland, Lancs, to Patricia Magdalen Davidson, of Great Crosby, Lancs.

DEATHS

Cox.—On June 14, 1953, at his home, 24, Offington Drive, Worthing, Sussex, William Alfred Spencer Cox, M.D., late of Church Street, Kensington, London, W., aged 89.

Evans.—On June 20, 1953, Albert Edward Evans, C.B.E., M.B., B.S., D.P.H., Lieutenant-Colonel, R.A.M.C., retired, of 11, Weymouth Avenue, Mill Hill, London, N.W.

Feilden.—On June 13, 1953, at the Royal Surrey County Hospital, Frederick Ernest Feilden, L.M.S.S.A., late of Guernsey, Channel Islands, aged 88.

Hamond.—On June 22, 1953, at 133, Tonbridge Road, Maidstone, Kent, Philip William Hamond, M.D., aged 73.

Hayden.—On June 12, 1953, Roger Keith Hayden, M.R.C.S., L.R.C.P., of London, W. and N.W.

Holroyd.—On June 14, 1953, at Nynhead, Somerset, Gilbert Holroyd, M.B., B.Ch., Lieutenant-Colonel, I.M.S., retired, formerly of Budleigh Salterton, Devon, aged 72.

Hynes.—On June 18, 1953, Mortimer Hynes, M.B., B.Ch., of 35, Southwood Lawn Road, London, N.

Ince.—On June 21, 1953, at Woking, Surrey, Joan Katherine Somerville Ince (formerly Cave), M.B.E., M.R.C.S., L.R.C.P., of Kenot Lodge, Lechlade, Glos.

Kilner.—On June 15, 1953, at 1, Lismore, Hollington Park, St. Leonards-on-Sea, Sussex, John Newport Kilner, M.B., D.P.H., aged 79.

MacMahon.—On June 22, 1953, at 63, Milton Road, Harpenden, Herts, Charles Grant MacMahon, M.B., Ch.B.

Newell.—On June 22, 1953, Alfred George Newell, M.D., D.P.H., of 14, Dane Road, St. Leonards, Sussex, aged 80.

Sharp.—On June 19, 1953, at the Kent and Sussex Hospital, Tunbridge Wells, Kent, Leonard Whitaker Sharp, M.B., of Woodlands, Wadhurst, Sussex, aged 70.

Shireore.—On June 23, 1953, at Zomba, Nyasaland, John Owen Shireore, C.M.G., M.B., Ch.B., M.R.C.P.Ed., aged 71.

Sturdy.—On June 17, 1953, Joseph Cornelius Sturdy, L.R.C.P.&S.Ed., L.R.F.P.S., of 13, Carr Lane, Acomb, York.

Taylor.—On June 22, 1953, at Gubblicote Cross, Tring, Herts, James George Taylor, M.D., formerly of Chester, aged 78.

Tuohy.—On June 15, 1953, Joyce Tuohy (formerly Stirling), M.B., Ch.B., of Street, Somerset, late of Dunelm, Lasswade, Midlothian.

Any Questions?

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

Child-bearing in the Tropics

Q.—Are there any special dangers attending pregnancy and childbirth in a tropical climate? Would a European woman be well advised to come home, or go to a hill resort, for the birth of her baby?

A.—A tropical climate *per se* does not create any special dangers in pregnancy, though it may be difficult to obtain proper medical attention in the Tropics. In this respect facilities vary from country to country, and it is impossible to generalize. Provided satisfactory medical attention is obtainable locally, it is not essential for the pregnant woman to return to this country for the birth of the baby. The advisability or otherwise of going to a hill resort should be decided on the relative merits of the facilities available. Other things being equal, it may be more comfortable to go to the hills if term should fall during the hot season.

Premedication for Thiopentone

Q.—What is the safest and best premedication before thiopentone anaesthesia?

A.—Thiopentone, like any other barbiturate, is not really an anaesthetic at all, since, so long as breathing is spontaneous and adequate, it does not abolish to any extent reflex motor responses to pain. Thiopentone is primarily a hypnotic, and it should really be used only for this purpose. In that case it provides a pleasant and rapid means of inducing sleep by intravenous injection, and when given in proper dosage interferes but little with the subsequent anaesthetic. Any premedication should have reference to the latter rather than to the small "sleep dose" of thiopentone.

Thiopentone is, however, still being used by itself as an anaesthetic—usually for short and minor procedures. In these circumstances premedication is best avoided altogether, since even the smallest additional sedative may prolong the period of recovery greatly. In general, respiratory depressants and hypnotics should be avoided before such use of thiopentone, unless the anaesthetist is prepared to manage respiratory depression and delayed recovery. If the patient is to be ambulant within a short time after thiopentone, additional sedatives, such as opiates and other barbiturates, are particularly contraindicated. The only form of premedication which is at all helpful when thiopentone alone is being used is atropine. This should never be omitted if there is any likelihood that an inhalation anaesthetic will follow the administration of thiopentone.

Pneumoconiosis without Radiological Changes

Q.—Is a diagnosis of pneumoconiosis ever tenable in the absence of radiological changes? If so, what diagnostic criteria must be satisfied?

A.—This question raises the difficult problem of the definition of pneumoconiosis. Pneumoconiosis is an abnormal process in the lung caused by the inhalation of dust. Theoretically it must start as soon as dust is retained in the lung and histological changes attributable to its presence develop. Such microscopic changes may be found in cases without radiological change during life. In such cases the diagnostic criteria are purely histological, and the diagnosis cannot be made during life. If the questioner implies by "pneumoconiosis" a disabling disease, then there will be radiological changes in the vast majority of cases. Occasionally coal-miners with gross respiratory disability but without radiological evidence of pneumoconiosis are found, at

necropsy, to have severe focal emphysema associated with considerable fibrosis due to dust, which must have played an important part in producing the disability. Presumably the translucency of the emphysema had obscured the radiological opacities which the dust deposits might have caused in its absence. This obscuration by emphysema may be more frequent than we realize. In byssinosis there may be gross disability attributable to cotton-dust inhalation, but there are no characteristic radiological abnormalities.

A diagnosis of disabling pneumoconiosis in the absence of radiological changes must always be presumptive unless recourse is to be had to lung biopsy. It may be that in the future a specific pattern of disturbance of respiratory function characteristic of pneumoconiosis may be defined and may assist in the diagnosis, but this has not yet been done, and one can do no more than recognize the possibility that a man with respiratory disability who has had significant dust exposure may be suffering from pneumoconiosis even though there are no radiological changes.

Inheritance of Amaurotic Idiocy

Q.—I have a patient, a first-born child aged 20 months, with amaurotic family idiocy. There is no Jewish strain on either side of the family nor any evidence of in-breeding. I should be grateful for information regarding the probable incidence of the condition in any future offspring, as the textbooks suggest the risk is considerable. Have any figures been published on actual cases?

A.—Infantile amaurotic idiocy (Tay-Sachs disease) is due to a recessive gene. The condition is considerably commoner in Jews than in others; nevertheless it does occur with a smaller frequency amongst those who are not Jews. In this instance the parents are unfortunate in that both happen to carry the gene, and the chance that any subsequent child will be similarly affected is one in four. An excellent paper on the genetics of infantile amaurotic idiocy has been published by D. J. Home.¹

REFERENCE

¹ *J. Genet.*, 1933, 27, 363.

Asthma and Deep X-ray Therapy

Q.—A woman of 60, who has suffered fairly frequent asthmatic attacks for the last 20 years, has been completely relieved of them since starting deep x-ray therapy a year ago for cancer of the breast with metastases in the lungs. What is the explanation of this?

A.—The possibility of coincidence can certainly be dismissed, for there is quite a literature on the results of deep x-ray therapy of the chest and spleen in the treatment of asthma. It is generally accepted that this therapy is often beneficial in asthma—occasionally dramatically so, as in this case—but more often improvement rather than complete relief occurs, and such improvement is usually temporary. Success is commonest in the chronic long-standing or infective type of asthma, the type of asthma which responds so well to cortisone and A.C.T.H. In this connexion it is interesting that Jiménez Díaz² has obtained marked improvement in asthmatics from nitrogen mustard injections; in these cases there was an increased excretion of urinary ketosteroids.³ How deep x-ray therapy works we do not know. Previously it was suggested that the psychological effect played a large part, but this cannot be the whole story. It may be because of its action on the reticulo-endothelial system.

REFERENCES

¹ Jiménez Díaz, C., *Rev. clin. esp.*, 1950, 38, 122.

² — *Helv. med. Acta*, 1950, Series A, 17, 583.

Phenoxyethanol

Q.—What are the actions and clinical uses of phenoxyethanol? Are there any special contraindications to its use?

A.—Phenoxyethanol ("phenoxetol") is a bacteriostatic and bactericidal substance which is effective against the

pyocyanus bacillus. It also acts on other Gram-negative organisms including *Proteus vulgaris*, although to a less extent. It has little action on the pyogenic cocci. Laboratory evidence¹ and the results of clinical trials² suggest that it is of considerable value. It has been used for superficial wounds, burns, and abscesses infected with *Ps. pyocyanus*, and should be applied along with an antiseptic active against Gram-positive bacteria—for example, penicillin or cetrinide.

After absorption phenoxyethanol causes drowsiness in rats, mice, and rabbits. In high doses (about 5 ml. intraperitoneally in the rat, and 16 ml. intravenously in the rabbit) it kills the animal, presumably by paralyzing the respiratory centre. No ill effects have been seen in man after the application of 40 ml. of a 2.2% solution daily to a large granulating wound, and this should be regarded as the maximum safe amount. There would seem to be no other special contraindication to the use of this substance, although if it were more widely used examples of hypersensitivity reactions would probably be reported.

REFERENCES

- ¹ Berry, H. (1944). *Lancet*, 2, 174.
- ² Gough, J., Berry, H., and Still, Bess M. (1944). *Ibid.*, 2, 176.

Use of the Title "Doctor"

Q.—Is the use of the title "doctor" by medical practitioners not possessing the M.D. degree governed by any legislation? The minute book of an old medical club from 1826–71 designates some members as "Mr.," some as "Esq.," and some as "Dr." In 1890 it uses the term "Dr." for all members, some of whom had previously been addressed as "Mr." or "Esq."

A.—This subject has been discussed in the medical journals on more than one occasion during the past century. In 1859 a correspondent to the *Lancet*¹ asked: "Non-graduated licentiates of the London College of Physicians being by courtesy styled 'Doctor,' may not the recently-elected licentiates of the Edinburgh College of Physicians so style themselves?"

The *British Medical Journal*² reported that under legal authority the College of Physicians of Ireland had assumed the right of giving the title of doctor to their fellows and licentiates (the legal authority being the Attorney-General for Ireland and the Solicitor-General for England). Again in 1862 the *Journal*³ gave its opinion that, "as regards the prefixing of Dr. before his name, we believe that any individual can do so with impunity." Correspondence on the subject, both in the *Journal* and the *Lancet*, continued to appear sporadically until 1874, when it was summarized in a leading article in the *Journal*.⁴ The difficulties of obtaining the M.D. degree by those who were otherwise qualified to practise were pointed out, and suggestions were made to remedy them. It further pointed out that "if the public choose to style every gentleman legally qualified to practise medicine or surgery by the title of Doctor, that is the public's own affair. Those only who hold the degree of M.D., obtained by examination, and not by purchase, are really entitled to it." The fact remains that the use of the title "doctor" is not controlled by any of the Medical Acts or by other legislation. It has by common practice become generally used by those duly qualified to practise medicine, whether or not in possession of a university doctorate.

The use of the title M.D. is another matter. Section 40 of the Medical Act, 1858, while not forbidding practice by the unqualified, attempts to enable the public to distinguish between qualified and unqualified practitioners. It prescribes penalties for the unlawful use of certain well-recognized titles, of which doctor of medicine is one, or any description implying that the user is registered under the Act. Even those entitled to use such a qualification may be prosecuted if they are not in the *British Medical Register*, and if such use is intended to represent that they are.⁵ The Medical Act, 1950, raised from £20 to £500 the

fine that may be imposed on a person wilfully and falsely holding himself out to be a registered medical practitioner.

REFERENCES

- ¹ *Lancet*, 1859, 2, 550.
- ² *British Medical Journal*, 1861, 1, 105.
- ³ *Ibid.*, 1862, 1, 232.
- ⁴ *Ibid.*, 1874, 2, 821.
- ⁵ *Ibid.*, 1949, 1, 1144.

Comedones in Infants

Q.—I have recently seen a breast-fed infant of 5 months who had numerous minute comedones on both cheeks. What are their cause and treatment?

A.—It is not at all unusual for comedones to be present on the face of a very young infant, being symmetrically distributed on the nose and around the naso-labial folds. Unless they become inflamed it is probably best to leave them alone, for they will disappear without treatment in a short while. It seems likely that they have a somewhat different cause from the blackheads which are seen in adolescent acne (though the precise cause of the latter is by no means understood). The greasy skin and comedones seen in infants have been likened to a sort of miniature puberty.

Isopropyl Alcohol

Q.—Can isopropyl alcohol be used as a substitute for methylated spirits or industrial alcohol for hospital purposes? It is readily available, not dutiable, and cheaper than ethyl alcohol.

A.—Isopropyl alcohol is a colourless liquid which boils at 82° C. When used undiluted it is in some ways preferable to 70% ethyl alcohol as an antiseptic both for metal instruments, which tend to rust less, and for the skin, to which it is said to be less irritant. When taken by mouth it is about twice as toxic as ethyl alcohol and has an unpleasant and mildly nauseating odour and taste. Although it is not subject to duty, its use is governed by the Isopropyl Alcohol Regulations, 1927, and those who manufacture, sell, or use it must render returns to the Customs and Excise authorities.

Vitamin B and Flatulence

Q.—Is there any known association between the oral administration of vitamin B and flatulence?

A.—When vitamin B is taken as live yeast or as yeast tablets, some of which contain a certain amount of live yeast, fermentation may occur if the conditions in the alimentary tract are favourable, and this could produce flatulence. The vitamins of the B group could not, however, have this effect when administered in the pure state.

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THE PLACE OF THE HOSPITAL IN A NATIONAL HEALTH SERVICE*

BY

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I must first express my deep gratitude to the President and Censors for doing me the honour of inviting me to deliver the Croonian Lectures this year. I recognize my inadequacy when I see the long line of distinguished men going back for over 200 years who have preceded me in this lectureship. All except one—and he had outstanding qualifications to speak on his subject of "Professional Freedom"—have been eminent clinicians or laboratory research workers. My role has been that of the medical administrator whose main purpose has been to provide the tools, and persuade hard-headed finance committees to provide the money, with which clinicians and laboratory workers could undertake their best work. From that background and my special interest in preventive medicine I shall endeavour to put before you my reflections on some of the problems which confront us in the light of the first five years of the National Health Service and on the relationship of the work done by the hospital and specialist service to the other two pillars of the National Health Service: the general-practitioner service and the miscellaneous services provided by the local health authorities.

Definitions

We must first define our terms. The *O.E.D.*, after referring to the original meaning of "hospital" as a charitable institution for the aged (Chelsea Hospital) and for the education of the young (Christ's Hospital), says that in the current sense it is "an institution or establishment for the care of the sick or wounded or of those who require medical treatment." The definition of "hospital" in the National Health Service Act is longer and more specific. It reads that a hospital "means any institution for the reception and treatment of persons suffering from illness or mental defectiveness, any maternity home, and any institution for the reception and treatment of persons during convalescence or persons requiring medical rehabilitation, and includes clinics, dispensaries, and out-patient departments maintained in connexion with any such institution."

For the definition of "National Health Service" we must go to the preamble of the Act which established it. It simply states that it is an Act "to provide for the establishment of a comprehensive health service for England and Wales and for purposes connected therewith." This contrasts with the preamble of the first

National Health Insurance Act of 1911, which states that it is "an Act to provide for insurance against loss of health and for the prevention and care of sickness. . . ." I draw attention to the specific reference to prevention in the 1911 Acts and that prevention has been merged in the comprehensiveness of that of 1946.

Origins of Hospitals

An American author well known in this country, General Paul T. Hawley, now Director of the American College of Surgeons (Hawley, 1948), says: "It is scarcely an exaggeration to say that hospitals were set up for the primary purpose of abating a nuisance and that they were operated accordingly for many years. . . . The sick, the crippled, the insane—especially those unable to pay for private care—were public nuisances." But I am sure that General Hawley would agree that, both in this country and in his, it is probably true to say that purely humanitarian motives have provided the main-spring for the establishment and maintenance of hospitals within, at least, the last century. But the provision of "fever" hospitals was due to a desire to protect the public and to isolate the victims of infectious diseases because of fear of their spreading. Earlier examples were the "leprosaria" of the Middle Ages. Whatever the motives, the hospitals of to-day spring from four main sources.

It is not generally realized that the largest component in the number of beds is the group of hospitals for the mentally disordered and the mentally defective. One, the Royal Bethlem, has just celebrated its 705th anniversary. Along with St. Bartholomew's and St. Thomas's, it is among the five "royal" hospitals with whose administration the Corporation of the City of London was, at least until 1948, closely associated. The other mental hospitals were mostly provided by the local authorities or, their predecessors for this purpose, the justices of the peace.

In those days the purpose of mental hospitals was purely "custodial" and for the protection of society and of the lunatics themselves. In fact, it was only in 1930 that the term "lunatic asylum" was replaced by "mental hospital" and "lunatic" by "mental patient." Special institutions for the care and rehabilitation, where possible, of the mentally defective are a comparatively recent development. The next largest component originated in the sick bays of the "workhouses" or institutions of the boards of guardians. The guardians of the poor

*The first of the Croonian Lectures delivered before the Royal College of Physicians of London on July 7.

had the statutory duty to provide accommodation for the destitute, and in a considerable number of cases the destitution was caused by illness.

Many of the boards of guardians, and later the major local authorities who took over these functions from them in 1930, took their responsibilities for the destitute sick very seriously. Hospitals, some quite first-class, were built to replace the sick bays, and from 1930 many were administered under the Public Health instead of the Poor Law Act, with the result that "any inhabitant of the district" was eligible for admission, though always the "destitute sick" had a prior claim for admission.

The third most numerous group of hospitals, in the number of beds provided, was the then "voluntary" hospital group. Apart from the few ecclesiastical foundations they began to be established about 200 years ago. Many have just celebrated their first centenary. Most of the "cottage" hospitals are of even more recent foundation. The initiative in the establishment of a voluntary hospital usually came from a keen doctor or group of doctors who secured the interest of one or more wealthy laymen whose motives were purely humanitarian and philanthropic. It was felt that the sick poor should not be forced into the Poor Law hospitals or institutions, in many of which the medical services had lagged behind development elsewhere. Also, it was abhorrent to many of the respectable poor to have recourse to the "Poor Law," which at that time still adopted a "deterrent" policy. The voluntary hospitals had the great advantage over the public hospitals that, so long as their committees of management could find the money, they could develop as they wished, and if, as generally happened, the most capable doctors of that locality were on the honorary staff, the lay committees had the best medical advice at their disposal. It was therefore inevitable that when teaching of the science and art of medicine was systematized the voluntary hospitals undertook the training of medical students. There were, however, in 1948 only 23 general teaching hospitals in England and Wales, of which 13 were in London, and one of them, the Hammersmith Hospital for postgraduate teaching, was under municipal management. Many of the rest of the 930 voluntary hospitals were quite small and their financial and medical resources inadequate for the more complicated medical and surgical work. As a further development many voluntary hospitals during the past fifty years provided beds or even separate wings for paying patients. The voluntary hospitals were also pioneers in the training of nurses.

The fourth group of hospitals forming the pre-1930 complement consisted of those provided and administered by the local authorities. Most were hospitals for the acute infectious diseases, and only a few of these were large, well staffed and modern. This group also included a number of sanatoria and maternity hospitals.

Beginnings of a Hospital Service

In 1930, as already mentioned, the former Poor Law hospitals were transferred to the administration of the county and county borough councils, and there were, in effect, from then until 1948, and disregarding the few private profit-making hospitals, clinics, or nursing-homes, only two groups of hospitals: those maintained by public money raised from the rates and the independent voluntary hospitals. Some of the voluntary hospitals received public money from local authorities for "services rendered"—for example, by providing special clinics for venereal disease or for school-children. Before 1930 the only attempts at providing a hospital service were limited to highly specialized fields—

namely, the mental hospitals of three or four large mental hospital authorities and the service of the Metropolitan Asylums Board, which provided fever hospitals, sanatoria, and hospitals for long-stay cases in children.

Even before the outbreak of the second world war in 1939 most voluntary hospitals were finding it hard to make both ends meet, and this would have been impossible had they not received substantial support from hospital contributory schemes.

The larger public authorities had during the period 1930-48 the opportunity of developing a complete hospital service as distinct from an agglomeration of separate and semi-independent units. They were encouraged by the Ministry of Health to dissociate them from the Poor Law, and to administer them under the Public Health Acts, and many did so. This provision of a service ensured that no inhabitant of their district who applied for, and was considered suitable for, treatment failed to obtain it in one or other of the authorities' hospitals. It enabled, also, special units, often of a research type, to be set up. Some of the more progressive authorities took full advantage of these opportunities and, despite the difficulties of the war period, a first-class public hospital service was in process of being developed. On the other hand, some local authorities had neither the resources nor the will to bring about major improvements. Their general hospitals were still being administered under the Poor Law Acts; their patients were mainly in the chronic sick group, and little was done to improve staffing, equipment, or buildings. In all areas, however, the public health and the preventive and hospital services were under the same local administration, and this ensured effective liaison and co-operation between the various services.

The War and its Aftermath: The National Health Service

The war, through the emergency hospital service and the various sector schemes, brought the two separate hospital groups—the local authority and the "voluntary"—more closely together. And the National Health Service Act of 1946, which provided for complete fusion of the local authority and the voluntary non-teaching hospitals, took them completely away from local government and placed them under central government control. The fourteen regional hospital boards nominated by the Minister of Health act as the Minister's agents and under the directions of his Ministry; they are the planning authorities for hospitals and the employers of consultants. The 400 hospital management committees, nominated by the regional hospital boards, are responsible for day-to-day administration of the hospitals within their group, but again subject to regulations made by the Ministry, and their money is obtained through the regional boards.

The teaching hospitals were also nationalized, but remained independent units, separate from the regional board system, and responsible direct to the Ministry of Health, but subject also to control by the regulations made by the Ministry. There are 36 boards of governors of teaching hospitals (14 London postgraduate, 12 London undergraduate, and 10 provincial undergraduate). As London is divided between four regional boards there are no fewer than 30 separate hospital administrative bodies operating within the areas covered by the single executive council for London and by the local health authority—the London County Council. By interchange of membership between boards of governors and regional hospital boards, there is some provision for co-operation between teaching and non-teaching hospitals, but it cannot be regarded as close co-operation such as occurs in Scotland, where the teaching and the non-teaching hospitals alike are administered by the regional hospital boards.

Reversal of Administrative Trends

Thus has come about the reversal of the general trend, which had been for decades to build up the administrative

responsibilities of the major local authorities—that is, the counties and the county boroughs—and to make them responsible for all public health, medical, nursing, and mid-wifery work, including hospital work, paid for by public money and operating in their areas. The administration of hospitals has been taken out of local government, and the Ministry of Health, to an increasing extent, undertakes executive responsibility and issues directives about the management and staffing of hospitals. This is in substitution, so far as local authority hospitals are concerned, for executive control by the local authorities and their officers. I will not enter into a discussion on which is the more tolerable method of control. There are advantages and disadvantages in each. But we must remind ourselves of the old adage that "whoever pays the piper calls the tune," and whoever supplies the money, whether the committee, as in former days, of a voluntary hospital or a public authority, whether central or local, must have the last word on how much money is available and how it should be spent. There is no escape from this, though the reins can be held more loosely in some administrations than in others.

It may here be mentioned, as a further illustration of the previous trend, that in 1928 the Royal Commission on National Health Insurance (National Health Insurance, 1928) recommended that the insurance committees responsible for "medical benefit" should be abolished and their work transferred to the county and county borough councils. This was for the purpose of consolidating the administration of all public medical work in the hands of the same local authority; but the 1946 Act disregarded this recommendation, and the executive councils, which have replaced the insurance committees, have even wider powers and authority than the former insurance committees, though by allowing local health authorities to nominate one-third of the committees it has been recognized that the work of the local health authorities and that of the executive councils has much in common and that they should operate over the same areas.

Distribution of Functions Within the National Health Service

There is no clear or logical line of demarcation in the present distribution of function between the three branches of the Service. By and large, preventive work falls to the local health authorities, but Newman pointed out so long ago as 1926 that "preventive and curative medicine are in intimate association," and "preventive medicine . . . embodies the whole of medicine as regards disease which is preventable especially in its beginnings rather than its end-results." A recent publication of the Public Assistance Department of Paris (*L'Assistance Publique*, 1953) puts the matter even more strongly. After referring to the important part which a hospital can play in the prevention of illness, and giving examples, it states that preventive and curative medicine should conjugate until they fuse. It continues: "La distinction entre la médecine préventive et la médecine curative apparaît, en effet, de plus en plus arbitraire. En réalité, la médecine est 'une.'" At the extremes of preventive and curative medicine they, of course, do not inter-mingle. Vaccination, for example, and immunization are clearly preventive, and the alleviation of symptoms in those afflicted with a mortal disease is neither preventive nor curative but simply remedial. But the early diagnosis and treatment of diseases which are curable, however, often prevent serious disabling or even fatal illness.

The isolation of those suffering from an acute infectious disease was introduced as a measure of preventive medicine for the purpose of preventing the spread of the disease, and in some instances—for example, smallpox—this still has validity, but in many infectious conditions all likely spread has taken place before the diagnosis has been made and the patient removed to hospital. Fever hospitals, therefore, for many years have derived their main value from the treatment given to the patients therein. But the spectacular

reduction in recent years in the incidence of epidemic diseases followed the discovery of their cause and, consequently, of their mode of spread, and the application of that knowledge. Is it too much to hope that, with increasing knowledge of the aetiology of the non-communicable diseases, dissemination and application of that knowledge will have equally happy results?

Tuberculosis—an infectious disease—is another example of the close relationship between preventive and curative medicine. Improvement of living and economic conditions for the individual, as well as for the community as a whole, is undoubtedly in the preventive field. So is educational work on early danger signals which should take the patient to the doctor. The searching for early cases among contacts and others should be regarded as a function of the authority for prevention just as it is in smallpox, but the mass radiography units have been transferred from the local health authorities to the regional hospital boards, presumably because it is they who employ all, or most, specialists in the public service.

An example may be given of a change which is not an improvement and which follows the thesis that hospitals are responsible only for patients for whom treatment is likely to be beneficial, and if no further benefit is likely they become the responsibility of the local health authority. This is a thesis which, though it may follow the statutes, is contrary to the public good. When the taking of steps to reduce the toll taken by tuberculosis was entrusted, before 1948, solely to the local authorities they provided institutional accommodation not only for the tuberculous, for whom treatment was likely to be productive, but also for the ambulant chronic sputum-positive patient who had no suitable home in which he could live. The institutions used were not elaborately equipped or staffed, but they made their patients comfortable and kept them out of harm's way. Very often such people live now in common lodging-houses.

The Metropolitan Regional Hospital Boards, with the concurrence of the Ministry of Health, have declined to admit, and are reluctant to retain, patients who are unlikely to benefit from further treatment, even though they are infectious. The local health authorities are therefore faced with the dilemma of leaving these people in common lodging-houses or providing hostels for them. When hostels are provided, the patients have, under the present law, to make a contribution towards the cost of their maintenance. Before 1948 no charge was made to such patients. As most of them have had free treatment in hospitals and as there is no power to require them to enter, or remain in, a hostel, it is not surprising that such places are difficult to administer and that the patients are reluctant to enter or remain in them.

The thesis that hospitals are to be provided only for those for whom treatment is likely to be beneficial is worthy of a further note. Some thousands of beds are provided by hospital authorities for the mentally defective, for whom the only therapy which can be provided is training and education. It will be remembered that the statutory definition of hospitals specifically mentions the mentally defective. Again, mild cases of smallpox are admitted, without question, to a hospital. No treatment is needed or provided, but only isolation. It seems a pity that, with these precedents, the chronic infectious tuberculous can be excluded unless they need treatment.

The divorce between treatment of the tuberculous and their rehabilitation at colonies such as Papworth and Preston Hall is another example of the difficulties which arise when artificial fences are erected in the course of what should be one process, under the same administration—namely, the restoration of a sick person to the working community. I am limiting my remarks here to the tuberculous, for whom treatment and training are so interlocked.

The working definition of these entitled to hospital care includes those who require constant nursing and regular medical care: this being the line of differentiation between

convalescent homes (hospitals) and recuperative holiday homes (local health authorities) and between the chronic sick (hospitals) and the aged and infirm (local welfare authority).

The Chronic Sick (Hospital Responsibility) and the Aged and Infirm (Welfare Responsibility)

The line of demarcation here also is by no means clear. Those responsible for the institutions to which admission is sought decide whether or not they will accept an individual patient, and there is no appeal to anyone who can give a binding decision when neither authority will have him and maintains that it is the responsibility of the other. There is the further complication that if the hospital authority accepts the patient no charge is made. If the local health or welfare authority does so, the patient is assessed to pay. But, however broad the dividing line, one must be fixed somewhere, as a hospital authority cannot be expected to provide accommodation for the aged and infirm, though when local authorities were responsible for both hospitals and welfare institutions the exact definition was not of great importance. There is much to be said for an arrangement which was common before 1948, but which does not accord with the present statute, under which the hospital provided medical, nursing, and pharmaceutical services for homes for the aged which were then called "public assistance institutions." The same doctor then decided when a patient should be transferred from the hospital to the institution, or vice versa.

With regard to patients at home, for whom the general practitioner has recommended admission to hospital, there always will be difficulty while the number of beds available falls short of the demand. A scheme started by Dr. E. B. Brooke, then of St. Helier Hospital, has much to commend it, though strictly it goes somewhat beyond the statutory provisions. He went to see the case in the patient's own home and met the general practitioner there. He was familiar with the local authority and voluntary services available, and, by appropriate use of them and of the hospital out-patient department facilities, the patient could often be looked after satisfactorily at home. At the Montefiore Hospital in New York City, Dr. E. M. Bluestone has developed a large scheme under which hospital consultant and other staff supervise the treatment of the chronic sick in their own homes. A suggestion has been made by the paediatric department of one London teaching hospital that many child patients could be spared the "psychological trauma" of separation from their mothers if the hospital services, including that of the paediatrician, were taken to the homes instead of the children being taken to the hospital. Any such schemes, however, for home treatment supervised by hospitals bring in the other two branches of the National Health Service, and there are so many different people with whom the matter has to be discussed and agreement reached that progress is slow.

Mention should here be made of the "half-way" houses for patients for whom an acute general hospital can do no more but whose nursing needs are such that they are unsuitable for a welfare home. They are regarded as part of the hospital organization, and so co-operation and selection of patients are easy. But, despite the generosity of the King Edward Fund and of the National Corporation for the Care of Old People in finding the capital for such places, there are not enough of them. In consequence many of these patients are in welfare homes and others remain in hospital. The latter are maintained free, the former have to pay a contribution towards their maintenance and, despite the reduced sickness benefit paid to long-stay hospital cases and to the fact that welfare cases are mostly pensioners—contributory or non-contributory—the patients themselves regard it as an anomaly and resent the differentiation. It is difficult to understand why the recommendation in the Beveridge report that a "hotel charge" should be made to hospital patients was never taken up.

Interlocking of Preventive and Curative Services

As a further example of the interlocking of preventive and curative medicine, the local authorities, 35 years ago, started clinics, mainly in general voluntary hospitals, for the diagnosis and treatment of venereal diseases. The patient was diagnosed, treated, and rendered non-infectious as speedily as possible, and this is probably the most important and effective method of reducing the incidence of these diseases. But education of the public, case-holding, and contact-tracing were also essential parts of the scheme. Except for education of the public, all these functions with their important preventive aspects are now largely in the hands of the hospital boards, which thus carry out important preventive functions. Further, doctors in the clinical field are to an increasing extent giving advice to their patients on how to prevent a recurrence of the illnesses for which they have been consulted. But Dr. Edwin L. Crosby, President of the American Hospital Association (International Hospital Federation, 1953), says, and the same applies to this country, "Education of the patient and his family while he is being treated in the hospital . . . is a relatively unexplored area that merits increasing attention."

I hope that I have made it clear that there can be no clean-cut line of demarcation between the work of hospital and health authorities so far as preventive and curative medicine are concerned. While hospitals may work primarily on the curative side, they carry out important preventive work. On the other hand, health authorities have a vital interest in much of the work of the hospitals, particularly when, as in their child welfare and school health work, they discover children in need of hospital treatment. In consultation with the family doctor, they refer them to hospital and so often prevent a minor condition developing, because of lack of early treatment, into something serious.

Local health authorities have, moreover, many important functions which have no direct concern with preventive medicine, however widely defined. These have been placed upon them because their boundaries are defined, and between them they cover the whole country. When Parliament imposes a duty upon them to provide a service everyone knows where the responsibility lies, and it cannot be evaded. This is very important in some instances, such as, for example, the taking into institutions of persons of disordered mind for whom care is needed for the protection of themselves or others. A duty of the local health authorities is to provide a 24-hour service of "duly authorized officers" who proceed at once to any place where it is alleged that there is a person of unsound mind who is in need of institutional care. In the mental health and mental deficiency services the officers of the local authorities find the patients and the hospital authorities are supposed to find the beds, but, at least the mental deficiency services, there is a lamentable lack of an adequate number.

The work of the "duly authorized officers" was formerly a duty of the, now abolished, relieving officers. Before 1948 these officers could also require a public hospital to admit any sick person from their area for whom hospital care appeared to be essential. He relied for advice on medical matters on the "poor law medical officer." The hospitals then served specified districts. Many think unfortunate that with the nationalization of the hospitals there is no longer any special obligation on individual hospitals to find room for the sick in their vicinity: nor, now, any local official who can require them to make room. I should, however, make it clear that in my experience there is little or no difficulty in finding a bed forthwith for an acute medical or surgical emergency. The difficulties arise in the long-stay or potentially long-stay cases, the tuberculous, the mentally defective, the chronic sick, and the aged. It would appear that the prospect of obtaining a bed decreases materially with advancing age.

Another utilitarian service provided by local health authorities is the ambulance service. The accident ambu-

lance service takes the patients to the hospitals—that is, it provides clients for the casualty or in-patient departments. The reverse occurs in the removal or transport sections of the ambulance service. Here, the hospital or the general practitioner orders the free ambulance or transport and the local health authority has to provide the vehicle and the driver and foot the bill, recovering, however, half from the taxpayers' money distributed by the Ministry of Health.

This criss-cross of administration under which one authority must look to another to carry out some of its functions—and few things can be carried to completion by the same administrative body from initiation to completion—is bound to lead to slowing down of action, increased paper work, and added expense.

Another function of local health authorities is to provide domiciliary nursing. The "ordering" of this, generally, is done by a general practitioner, or, for a patient about to be discharged, by a hospital. A similar service is that of "home" or "domestic" helps, but it is not a statutory duty of local health authorities to provide this service. It is only a "power" which Parliament says the local authorities may exercise if they wish. The local authorities, therefore, can in this service decline to comply with the wish of a general practitioner or a hospital that a home help be provided. In practice, however, it is unusual for such a request to be declined, though there may be difficulty in meeting it fully. From my recent visits to other countries I gather that this type of service under a public authority is unique to this country.

The Maternity Services

It is perhaps in the maternity services that interlocking of function between the three branches of the National Health Service is most pronounced. Hospitals can provide a complete antenatal clinic service for their booked patients, and, though they are asked by the Ministry of Health, following advice given by the Central Health Services Council, only to book patients who need a bed on obstetrical or social grounds—the latter being determined by the local health department—some hospitals accept all comers.

Local health authorities have the duty to provide a service of domiciliary midwives, and they also provide antenatal clinics. Sometimes hospitals send their booked cases to municipal antenatal clinics for intermediate supervision and the clinics send them back at the 36th week, or immediately on the occurrence of any abnormality. Hospitals can also ask the midwives or health visitors of the local authority to look up those who should have attended the hospital antenatal clinic but have defaulted in doing so. Some hospitals which are training schools for midwives have an extern department which is part of the local authority's midwifery scheme and paid for by it. Some expectant mothers still book a domiciliary midwife and leave it to her to call in a doctor, as required by the rules of the Central Midwives Board, should any abnormality occur. In this case the doctor is paid by the local health authority. On the other hand, the patient may book a doctor for the domiciliary confinement, and he may be either a general-practitioner obstetrician on the special list or the patient's own doctor. In either case he is paid by the executive council. The patient in these cases also has the services of a municipal midwife, who, again, may either act as a midwife, if the booked doctor does not attend the actual confinement, or as a maternity nurse if he does.

The patient may receive all her antenatal care from the doctor and the midwife or she may attend the municipal antenatal clinic for educational lectures, blood tests, antenatal exercises, and medical supervision as well. The hospital is concerned in these cases in that they may be sent there if any serious emergency arises, and maternity hospital provision in every area must take account of this contingent liability. Again, if post-partum haemorrhage or other serious mishap occurs, the hospital may be asked to send to the home the "flying squad." The domiciliary doctor also may at any time call in a specialist obtained from,

and paid for by, the hospital board, for a consultation at the patient's home. Those with a liking for tidy administration are horrified by this jumble of authority, but, despite it, the maternal mortality has been reduced spectacularly in recent years, and preventable deaths are very rare.

Almoners and Health Visitors

Another overlapping field concerns the work of hospital almoners and of the health visitors employed by the local health authorities. Now that almoners are no longer concerned with the assessment of means and the collection of money, and now that doctors are more alive to the part played by occupational, environmental, and economic factors in the causation and prognosis of disease, almoners are increasingly called upon by hospital staffs to supply information on these matters. On the other hand, the duties of health visitors as set out in the National Health Service Act, 1946, are: "Giving advice as to the care of young children, or persons suffering from illness, and of expectant and nursing mothers and as to the measures necessary to prevent the spread of infection." The Ministry of Health has expressed the view that, normally, hospital almoners should not pay home visits and that information needed about home conditions should be obtained from health visitors, who should be the family case workers.

Again, local health authorities have responsibilities for aftercare, and some, by agreement with hospitals, follow up in their homes and as helpers of the family doctor cases of gastric and duodenal ulcer and of diabetes discharged from hospital. Some mental hospitals employ their own psychiatric social workers to make home inquiries; others ask the local authorities to do so. Some institutions for the mentally defective have their own staff to supervise their patients out on licence: others use local authority staff.

Local education authorities have statutory responsibilities for safeguarding the health of schoolchildren. They must provide for routine medical examinations, and if treatment is found to be necessary they must see that the child gets it from a general practitioner, at a hospital, or at a school clinic. Yet some hospitals steadfastly refuse to pass information to the school medical officer about schoolchildren under their care, on the grounds either of inadequacy of clerical staff or of a breach of the doctor-patient relationship. All would agree that the parents' consent to the transmission of the information should be obtained, but when it is put to the parents that it is in the interests of the child's education refusal is extremely rare.

The above are only examples of the interlocking of the health and hospital services and of some of the difficulties, actual and potential, met with in the desire to achieve adequate integration. Having regard to the "oneness" of preventive and curative medicine, any attempt to allot only preventive services to local authorities and only curative to hospitals would be doomed to failure.

General Practitioners and the Hospital Service

The Scottish Health Services Council (1952) has recently examined and reported upon the relationship between the general practitioner and the hospital service. It refers to the method of appointment of specialists, and points out that it is now difficult, if not impossible, for the general practitioner, even with the requisite qualifications and experience, to obtain a post as a consultant. It also discusses the use made of the general practitioner in institutional midwifery and the absence of full facilities for the general practitioner to follow his patients into hospital. A fourth point is the difficulty of access by the general practitioner to the ancillary services provided by the hospitals, particularly those of the x-ray and pathological departments.

It recommends that the specialist establishment of a hospital should include provision for doctors who are engaged

partly in general and partly in specialist practice. They commend as part of a long-term policy the establishment of general-practitioner wards or blocks associated with general hospitals and the continuance of existing cottage hospitals. It also recommends direct access of general practitioners to hospital x-ray and pathological departments. A step forward, however, is the new provision by which consultants can be called in for a domiciliary consultation under the Act. This provides that personal contact between consultant and general practitioner which is so desirable.

It may also be mentioned here, with regard to the relationship between general practitioners and the local authority health services, that the Act has, on the whole, tended to make it closer, particularly as compared with the relationship with the hospital service, where the Act has severed the former bonds. The practitioner can be helped materially by several of the local authority services, particularly the home help, the home nursing, and the ambulance sections. There is an interesting development in a few areas where a health visitor is attached to a general practitioner, and this, again, may well forge a link between all the services at the local level. The attendance of the medical officer of health at meetings of the local medical committee has enabled each to understand, and appreciate, the problems of the other. On the hospital side, it would help to close the gap if, to an increasing extent, medical officers of health were co-opted on to the medical staff committees of hospitals.

The National Health Service: A Divided House

It is recognized generally that a weakness of the new service is the division of its administration into three separate compartments, and that it is essential that all who work in it should realize that there is only *one* National Health Service, that all proposals for development and change should be discussed with representatives of the other services, whose own work, in some way or another, is likely to be affected. Professor James M. Mackintosh in an address to the Royal Medical Society at Edinburgh in February, 1951, said: "In the entire Act there is no broad conception of a national health policy, only a fragmentation. It has failed because it has set a gulf between divisions which ought to have been brought together—the hospital, the general practice of medicine, and the public health service." Above all, there must be a regular exchange of information so that all concerned may be aware of what is going on and what is proposed, so that they can put forward their comments before it is too late.

All this means more and more time on paper work and attendance at committee meetings, but it is part of the price we pay for rationalization, nationalization, or whatever word we use for attempting to do things comprehensively and on a nation-wide or large scale. A committee of the Central Health Services Council (1952) spent many months in 1951 considering how the National Health Service could be more closely integrated and function as one service instead of three separate dominions. It gathered much information and it was clear that in some localities valiant attempts are being made to bring together for consultation and discussion representatives of the three branches of the Service. It was felt that this could best be done at the level of the hospital management committees, but this is not easy if the local government area contains several such committees or if the normal gathering-ground of the hospitals in the group covers several local government areas.

A Unified Service

Some may feel that the only logical solution of all these administrative difficulties is to have for each area one, and only one, body responsible for the administration of all three branches. This involves many difficult questions.

In the first place, should the administrative responsibility be in the hands of nominated or elected bodies? It is the general experience that nominated bodies have not the same

sense of financial responsibility as elected ones. Possibly because of this, hospital boards and management committees have been subjected to tighter and tighter control by the Ministry of Health.

Comparisons are sometimes drawn between the hospital service, administered locally by a multitude of boards and committees whose members are unpaid, and corporate bodies like the B.O.A.C., and the Coal, the Gas, and the Electricity Boards. They are reputed to be administered on more business-like lines and are given more financial freedom than are hospital boards. The late Viscount Dawson was attracted by an administration based on that of the B.B.C., and Dr. Stephen Taylor (1951, 1952) would administer the service by small boards of paid directors. Not everyone would agree that the corporate bodies mentioned have the advantages claimed, but the essential difference between the two types of service is that all the corporate bodies are revenue-earning. They all sell something, and, despite the shocks received by the taxpayers when they show a deficit which has to be provided from public funds, they are, at least in theory, supposed to pay their way and to cover their expenditure by revenue. The B.B.C., however, is now an exception, though at first it conformed to the general rule that it should be self-supporting. It does now receive subsidies for its foreign broadcasts, but even this may be regarded as a sale to the Government of services which could not otherwise be provided economically.

Financial Problems

Unless, as is most unlikely, there is a radical change in the basis of our hospital service and, as in the U.S.A. and in certain States of Australia, hospital revenue is derived from contributory schemes—voluntary or compulsory—and from patients direct, hospitals will always be a heavy charge on public funds. It would not be impossible to devise a scheme which would substitute a small nominated body for the Minister of Health and his officers and put it in charge either of the hospital and specialist service alone or of the whole of the National Health Service, give it a global sum which would have to be settled annually by Parliament, and tell it "to get on with the job." But it is extremely doubtful if this would accord with Parliamentary principles as applied to the expenditure of such vast sums of public money. Further, in my view, their stick would be heavier than that of the Ministry and used more often. Also, in my opinion, it would in the long run cost more for administration.

Before 1948 a not unsatisfactory balance was maintained between the aspirations of those who wished to extend and develop hospital services and what could be afforded on hospitals by the fact that the spenders of the money—that is, the hospital boards and committees—had to raise it themselves. In the case of voluntary hospitals the members had to look round for sources of increased revenue, and in the local authority hospitals, where the money came from the ratepayers, they had to subject themselves to the electorate every three years and run the risk of being turned out if they had been either too parsimonious or too extravagant. In any case they were subjected to searching questions about the hospitals at election, and, indeed, at any other time.

It was hoped when this service started that hospitals would be provided by the Ministry with adequate funds, not only for the maintenance but also for the development of the hospital service, and that considerable freedom would be given to hospital boards and committees in the way they were spent. This might well have happened if hospital costs had not risen steeply during the past few years. Incidentally, they have risen just as steeply in other countries. With these rising costs and the amount of money which Parliament can properly vote, having regard to the total national income and the competing claims of other national services, being not unlimited, financial control becomes imperative at least as regards the total bill. The extent to which it needs to be detailed depends on the

importance attached in a national service to all parts of the country being provided with the same type and range of service and to people doing the same job getting the same rate of pay, and having the same conditions of service, and on staffing ratios being reasonably similar in comparable hospitals. Organizations representing staff insist on at least minimum rates of pay negotiated nationally for the same job, and the Ministry, as the paymaster, not unnaturally desires uniformity so that special rates of pay given to a particular individual may not be used as a bargaining-point for a general all-round increase.

Capital expenditure has had to be curtailed because of the licensing system, necessitated by the shortage of money, building materials, and building labour. One last point on finance which I have heard on my travels abroad is that unless rising hospital costs can be curbed, hospitals, except for the most serious illnesses, and then for the shortest possible length of stay, will almost price themselves out of existence, as neither the public nor any private purse will be able to afford them. There is little wonder that increasing attention is being paid everywhere to schemes for keeping people out of hospital and caring for them, whenever possible, at home.

All the above has a bearing on the question I am discussing—namely, should the administration of the three branches of the service be combined and should the local control be in the hands of nominated or elected bodies? If the administration of the three branches is combined—which, as I have indicated, would remove many anomalies—it could function only through nominated bodies if the whole charge were met from Government sources. If the rate-payers' money is involved, then, under our system of local government, elected representatives who are empowered to levy a rate must be included. It should be mentioned here that bodies nominated by the Minister, in effect appointees of the Minister, cannot bring pressure to bear on a Ministerial department to the extent that an independent elected body can, particularly if it is spending its own money and not entirely that of the Minister. There is a stronger case for a nominated body if the hospital service is to remain separate from the other two branches.

Local Government

The removal of the personal health services from local government would, however, be a very serious matter. Speaking quite generally, the local authorities have made a success of their health services, in which they have taken a deep interest. The occasional failure receives the headline; the success goes unnoticed. Another very important branch of local government work is the education service, of which the school health service is an integral part. It also makes a substantial contribution to the health of a very important age group. The school health service is outside the National Health Service, and the removal of the latter service to an independent body, outside local government, would be a major disaster to the education service. The anomaly of separate administrations dealing with the health problems of children under school age and of school-children, against which a Royal Commission reported in 1926, would be revived. It must be remembered that the school health service involves not only the routine medical examination of the children but also the selection of children for special education, and advice on school buildings, school furniture, and school meals.

It is essential also that the new children's departments dealing with orphans and neglected children and the welfare departments dealing with the aged and infirm and with handicapped persons should have expert medical advice readily available. In fact, there are few departments of local authority work which do not call on, from time to time, the medical officer of health for his advice. Sometimes the advice is unpalatable, but it is accepted from their own trusted officer when it might not be if it came from an officer employed, and paid, by the Government. All this is apart from the duties of the local health officer in connexion with the control of epidemics and environmental

hygiene. If the present health services of local authorities were transferred to a new organization of nominated members deriving all their money from Government sources, a major part of the scaffolding of local government would fall and incidentally there would be little or no case for local authorities employing whole-time trained health officers and medical administrators. Even if they did, the scope of the duties would be unattractive compared with other opportunities in the field of medical administration. Further, administrative difficulties which are not quite germane to our subject, and therefore will not be pursued, would arise if the work of the executive councils were transferred to a similar nominated body.

The answer, then, to the question whether the three branches should be combined and administered centrally by the Ministry of Health and locally by nominated bodies is that it would be inadvisable.

Local Administration by Elected Bodies

Next, let us turn to the possibility of their local administration by bodies wholly or partly elected. It will be assumed that there should be nominees of the professional interests concerned, though this is a departure from normal administrative procedure in this country, where, until 1948, professional experts were advisers, and not members, of the body which was in financial control and which determined policy. This is still the procedure at central and local government levels, though most local health authorities co-opt a few professional members on their health committees. It is interesting that the professional groups who insisted, and in the circumstances of the time did so properly, on being represented on every committee dealing with hospital work now complain of the long hours they have to spend attending committees to the detriment of their professional work.

A point against elected bodies for the control of hospitals is that there are invaluable members of hospital boards and committees who belong to no political party, who would decline to submit themselves to the electorate, and who would be unable or unwilling to take part in the general work of local authorities. Provision, therefore, would have to be made for the co-option of at least some of them. There are, on the other hand, many members of local authorities who are intensely interested in hospital and health problems and are prepared to devote much time to committee work. Some of these are giving, under the present organization, active and valuable service to local authorities as elected members, and to hospital boards and committees as nominated members.

Local health authorities now nominate one-third of the members of executive councils. If they were able to nominate a proportion of the members of a new body administering all three branches of the National Health Service, it would help to ensure that local opinion could be expressed by those who had, at least, the confidence of those who had elected them to the local authority. Moreover, it would help to bring the two administrations—local authority and the health services—more into alignment and might lead to the local medical officer of health holding a joint appointment, carrying out for the local authority, as their own officer, the various duties outside the National Health Service which would remain with them and, for the new authority, the duties which would be transferred to it, and which up to then would have been under his direct administration. If the money were not all provided centrally, that portion of the budget represented by services financed, partly or wholly, by the local rates would have to be submitted to the finance committee of the local authority concerned.

The conception of an *ad hoc* body elected specially by popular vote, and with power to precept on local authorities, for the administration of the combined service can be ruled out. The school boards and the boards of guardians, elected on such a basis, have now both disappeared. John Stuart Mill (1861) says "that there should be but one elected body

for all local business, not different bodies for different parts of it. . . . The local, like the national, Parliament has for its proper business to consider the interest of the locality as a whole." Except for later ideas involving two-tier government, as in county council areas, he is probably right.

[The second lecture, together with a list of references, will appear in our next issue.]

STAPHYLOCOCCAL INFECTION OF THE NEWBORN*

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During the neonatal period minor staphylococcal infection is a frequent occurrence. The recorded incidence of such infection depends so much on the criteria adopted and on the care with which minor septic lesions are looked for that a close comparison of published figures is of limited value. The wide variation in recorded neonatal skin and conjunctival sepsis rates in

TABLE I.—Reported Neonatal Skin and Conjunctival Sepsis Rates in Maternity Units

Author	Period	Skin Sepsis	Conjunctivitis
Henderson (1943)	1940-1	6.8%	15.9%
Corner (1946)	1944-5	6.58%	13.49%
(2 maternity units)		10.0%	17.6%
Frazer (1948)	1946-7	1.58%	0.61%
Roscoe (1949)	1947-8	2.06%	4.32%
(2 maternity units)		5.4%	1.62%
Galsford et al. (1951)	1949	4.7%	2.9%
Barber et al. (1949)	1949	3.6%	9.2%
Present series:			
Western General Hospital, 1951	1951	2.3%	4.1%
Eastern General Hospital, 1951	1951	2.3%	4.2%

various maternity units in this country is shown in Table I. These figures do not refer to staphylococcal infection alone, but this is responsible for most of the skin and conjunctival sepsis in the neonatal period. Henderson (1948), for instance, has shown that the incidence of staphylococcal infection in neonatal conjunctivitis is approximately 80%. We have found, from 100 consecutive swabs from septic lesions of the skin and conjunctiva, that where an organism was isolated the incidence of staphylococcal infection was 91%. No growth was obtained from 18 swabs.

In the two main maternity units in our group of hospitals births numbered 1,093 and 1,296 respectively during 1951 and the sepsis rates given are derived from the routine records on the baby charts. An attempt is made to record all septic lesions, no matter how small.

*Based on a paper delivered to the Scottish Paediatric Society on June 13, 1952, by Dr. Forfar.

No deaths from staphylococcal sepsis occurred during the lying-in period, but one baby (Case 3) was re-admitted to hospital and died from staphylococcal infection, almost certainly acquired during his stay in one of the maternity units.

Most neonatal staphylococcal infections are trivial and short-lived, but they are potentially dangerous. A few years ago penicillin provided a weapon with which the severer types could be successfully treated, and its use soon spread to the treatment of minor lesions and even to prophylaxis (Wallace, 1947; Muhl, 1949). In recent years the emergence of resistant strains has rendered penicillin ineffective in the treatment of many staphylococcal lesions. There is a rising incidence of such strains (Barber, 1947; Barber and Rozwadowska-Dowzenko, 1948), particularly in hospitals (Forbes, 1949; Rountree and Thomson, 1949; Barber et al., 1949). The newer antibiotics aureomycin and chloramphenicol have so far provided effective therapy in most resistant infections (Banks, 1952; Lancet, 1952).

It is the purpose of this paper to report several cases of serious staphylococcal infection in the newborn in which resistance to antibiotic drugs played an important part, to record a few observations on the background of staphylococcal carriage and infection in one of the maternity units from which some of the cases arose, and to draw attention to some of the problems of diagnosis, of management, and of treatment which such staphylococcal infections raise.

Case 1

A baby girl, born in a nursing-home, birth weight 5 lb. 10 oz. (2.55 kg.), was admitted from her own home to hospital at the age of 4½ weeks with a swelling of the left upper arm of three days' duration. This had been accompanied by pyrexia, and on the day before admission she had been given 200,000 units of penicillin.

On admission a purulent discharge from the left eye was noted. No growth was obtained from an eye swab. No other septic lesions were found. The white-cell count was 6,000 per c.mm. Radiological examination of the affected humerus showed osteomyelitis with patchy destruction of the lower end. Intramuscular penicillin, 100,000 units three-hourly, was given.

On the following day an abscess had formed and was incised, a large amount of pus escaping. On culture a profuse growth of *Staphylococcus aureus* sensitive to penicillin, streptomycin, aureomycin, and chloramphenicol was obtained. Despite the continued administration of penicillin the pyrexia persisted and the child's condition deteriorated. On the third day after admission she developed a cough, rapid shallow respirations, moist sounds at both bases, and a slight haemoptysis. An x-ray film of the chest showed consolidation at both bases. The white-cell count was 19,200 per c.mm. Aureomycin, 250 mg., and chloramphenicol, 125 mg., six-hourly, were begun.

Two days later pus from the wound in the left arm grew on culture a coagulase-positive *Staph. aureus* resistant to penicillin but sensitive to streptomycin, aureomycin, and chloramphenicol. At this time an abscess developed in the left parieto-occipital region. This required incision after 48 hours, and appeared to have arisen from infection of the underlying bone. A coagulase-positive *Staph. aureus* highly sensitive to streptomycin and chloramphenicol, moderately sensitive to aureomycin, and resistant to penicillin, was grown.

Penicillin was given for 17 days after admission. Treatment with aureomycin and chloramphenicol was continued for almost a month on account of several relapses of respiratory infection. After a period of two months the child had

improved considerably and was discharged home. Radiologically, several post-pneumonic pneumatoceles still existed. The humerus had almost completely re-formed.

Comment.—Conjunctival sepsis may have been the original focus of infection in this case, which illustrates the widespread metastatic dissemination which staphylococcal infection in the newborn may undergo. The staphylococcus isolated from pus drained from the original abscess of the left arm was penicillin-sensitive. Four days later pus from the same source revealed a penicillin-resistant organism. Presumably two strains of staphylococci, a penicillin-sensitive and a penicillin-resistant, were present initially, as resistance could hardly have developed within four days. Growth on culture of the sensitive organism only, created a false sense of security, and although penicillin rapidly removed this strain it produced no clinical improvement. The response of the original osteomyelitis to chloramphenicol and aureomycin was satisfactory, although these drugs did not prevent further progress of the infection to the scalp. They produced no dramatic improvement in the chest infection, but it seems doubtful whether the child would have survived without them.

Case 2

Birth weight 8 lb. 9 oz. (3.98 kg.). Condition satisfactory at birth. Discharged home after ten days. Two weeks later paronychia was noted on several fingers of each hand and local treatment with gentian violet was given. Three weeks later a septic spot on the right arm developed into a subcutaneous abscess. Three days thereafter her breathing became distressed.

Now 6 weeks old, she was admitted to the children's unit acutely ill with severe dyspnoea, high fever, clinical evidence of pneumonia, and a pleural effusion. Diagnostic aspiration showed thin yellow pus. The white-cell count was 21,000 per c.mm. Penicillin was given, but next day the temperature rose higher and the effusion had increased. Penicillin, 50,000 units, was injected into the pleural cavity. Culture of the pleural fluid showed the presence of *Staph. aureus* resistant to penicillin and streptomycin but sensitive to aureomycin and chloramphenicol. She was then given aureomycin, 500 mg. daily. This produced constitutional improvement, but further chest aspirations and finally open drainage were required.

Thereafter gradual re-expansion of the lungs occurred, and was complete three months after the illness started. At that time the baby's health was excellent.

Comment.—On admission to the children's medical ward the diagnosis of empyema was made, but it was not appreciated that the infection could be traced back to staphylococcal skin sepsis immediately after discharge from a maternity unit. Consequently, valuable time was lost before effective antibiotic therapy was instituted. The final result was satisfactory, yet it seems likely that immediate treatment with aureomycin or chloramphenicol might have resulted in a much less serious and prolonged illness.

Case 3

A baby boy, birth weight 6 lb. 1 oz. (2.75 kg.), was discharged home on the ninth day, gaining weight. On the twelfth day slight conjunctival injection was noted in the right eye. The next day the eye was swollen and a purulent discharge appeared at the right nostril. The family practitioner began injections of procaine penicillin, 300,000 units daily. These were continued for five days without improvement. At the end of this time the left arm was thought to be paralysed. No signs of toxæmia were noted.

Now 18 days old, he was readmitted to hospital. The right eye and cheek were swollen and dusky with abundant purulent discharge from the left nostril. Over the inner aspect of the right ankle there was a fluctuant swelling. The left upper arm was swollen. Deep subperiosteal oedema could be detected with some difficulty. No radiological evidence of bone destruction was found. Pus obtained from the nose and ankle grew *Staph. aureus* sensitive to strepto-

mycin, chloramphenicol, and aureomycin and slightly sensitive to penicillin. Chloramphenicol was given before this result was available, and as the immediate clinical response was excellent it was continued. Three days after admission a subperiosteal abscess over the left humerus required incision. Antibiotic therapy was stopped on the eleventh day. Within 24 hours an acute relapse set in, involving all the previously affected areas. An x-ray film now showed gross destruction of the left humerus and some destruction of the right maxilla. Chloramphenicol again effected rapid improvement. Further sensitivity tests confirmed the original findings.

Progress, though slow, was satisfactory for four weeks. A persistent slight nasal discharge, however, suggested that the maxillary infection had not been entirely overcome, and after 28 days' continuous treatment with chloramphenicol an acute re-exacerbation occurred. A nasal swab grew *Staph. aureus* which was still reported sensitive to chloramphenicol. Aureomycin (125 mg. every six hours) was substituted for chloramphenicol, and improvement occurred within 24 hours. This treatment was continued for three weeks until repeated nasal swabs showed no evidence of staphylococcal infection. A solid involucrum formed over the left humerus and the patient was discharged home gaining weight and with full movement of the left arm. Routine surveillance over the next eight weeks showed satisfactory progress. At the end of this time he was readmitted to the ward with a reactivation of his humeral infection. The sensitivity of the *Staph. aureus* cultured remained as before and there was a rapid response to aureomycin.

Comment.—With an effective antibiotic it is unlikely that the initial infection would have undergone such widespread dissemination or that local bone destruction would have been so extensive. The rapidity of the relapse when chloramphenicol was stopped after 11 days suggests that large numbers of viable staphylococci were still present despite the absence of clinical evidence of activity for seven days, and is a warning against too early cessation of therapy with a drug which is bacteriostatic. The second relapse after 28 days' continued treatment emphasizes that even a sensitive organism may persist unhindered in abscess cavities.

Case 4

A baby boy, birth weight 7 lb. 10 oz. (3.4 kg.). On the third day, on account of suspected early respiratory infection, he was given chloramphenicol, 350 mg. daily, and this was continued until his discharge on the fourteenth day, when he appeared well. The cord had not completely separated.

Three days later he was readmitted on account of sudden anorexia and apathy. He was pale and listless. No cry could be elicited. No enlargement of liver or spleen was noted. The umbilicus was encrusted with a recent blood-stained discharge, but there was no exudate. The white-cell count was 4,800 per c.mm.

Chloramphenicol was started immediately—350 mg. daily, divided into four doses. During the next day he seemed somewhat improved, but the rectal temperature, which was 99° F. (37.2° C.) on admission, rose to 102° F. (38.9° C.). Two days after admission the respirations became a little distressed. The liver now appeared slightly enlarged. During the night the baby was found dead.

Post-mortem Examination.—Phlebitis of the umbilical vein was present with multiple abscesses throughout the liver. There were septic infarcts in the lungs, kidney, and heart; the latter involving a large coronary artery and resulting in severe muscle necrosis. Culture of various abscesses produced *Staph. aureus* resistant to penicillin, slightly sensitive to aureomycin, but markedly sensitive to chloramphenicol and streptomycin.

Comment.—The pathological findings suggest that infection originated from the umbilicus and spread via the umbilical vein. This spread must have developed during the time chloramphenicol was being given. In the presence of a

sensitive organism chloramphenicol was administered for 14 of the 19 days which this infant lived, and it must be concluded either that a dosage of 50 mg. per lb. (110 mg. per kg.) daily was incapable of maintaining adequate tissue levels or that on this occasion there was present a degree of *in vivo* resistance which the *in vitro* test did not reveal. That gross visceral infection may develop in the newborn without distinctive clinical signs and without leucocytosis was well illustrated.

Case 5

Birth weight 8 lb. 13 oz. (4 kg.). On the sixth day a purulent conjunctival discharge was noted, and culture produced *Staph. aureus* resistant to chloramphenicol and penicillin, but sensitive to aureomycin. Treatment was started with aureomycin, 500 mg. daily.

On the twelfth day, aureomycin therapy continuing, an abscess had developed in the left breast which on incision was found to originate from infection of the underlying rib. Culture produced a *Staph. aureus* sensitive to both chloramphenicol and aureomycin. The continued use of aureomycin was attended by prompt recovery.

Comment.—It is likely that two separate strains of staphylococci were involved in the initial infection, since it is unlikely on present evidence that a resistant organism could lose resistance to chloramphenicol within six days. The presence of two separate foci of infection strongly suggests blood spread, which, despite *in vitro* sensitivity to aureomycin, progressed while this drug was being given.

Case 6

Born by caesarean section at full term; birth weight 5 lb. 1 oz. (2.3 kg.). Some slight discharge from the eye was noted after twenty-four hours.

On the eighth day a few small pustules in both axillae and over the shoulders and a deep firm mass on the left side of the neck appeared. Chloramphenicol was started, 350 mg. daily. Despite treatment the mass increased in size and became fluctuant. Aspiration produced thick pus from which *Staph. aureus* resistant to chloramphenicol and penicillin but moderately sensitive to aureomycin and streptomycin was cultured. Aureomycin was given in a dose of 250 mg. daily, and with occasional further aspiration the abscess healed.

Comment.—Clinical chloramphenicol resistance was confirmed bacteriologically.

Bacteriological Studies

During the period when the majority of the clinical infections reported here occurred a limited number of tests were performed to identify the frequency and distribution of various types of staphylococci. In one of the maternity units concerned routine umbilical swabs were taken from the cord stump as soon as this separated, nasal swabs were taken from all the medical and nursing staff, and cultures were obtained from all cases with clinical infections, however benign, and sensitivity tests made. These results are presented in Tables II, III, IV, and V. The sensitivity tests were carried out with the impregnated disk technique described by Gould and Bowie (1952) modified in respect of the concentrations of

TABLE II.—Clinical Infections, 1951: Analysis of Antibiotic Sensitivity of Staphylococci Isolated from 56 Separate Infections

	Penicillin				Streptomycin				Chloramphenicol				Aureomycin			
Degree of sensitivity	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
No.	43	5	3	5	7	7	3	39	8	4	6	28	2	0	2	41
Total examined	56				56				46				45			
% resistant	76.6				12.5				17.4				4.5			

0 = No inhibition 1 = Slight inhibition 2 = Moderate inhibition 3 = Inhibition equivalent to standard sensitive strain.

TABLE III.—Nasal Swabs (Hospital Staff) (51 Cases: Coagulase-positive, 26; Coagulase-negative, 22; no Staphylococci, 3) Antibiotic Sensitivity of Staphylococci (Coagulase-positive)

	Penicillin				Streptomycin				Chloramphenicol				Aureomycin			
Sensitivity	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
No.	8	12	4	2	0	1	1	24	0	0	2	24	0	0	0	25
% resistant	30.7				0.0				0.0				0.0			

Carriage rate for coagulase-positive staphylococci = 53%.
Carriage rate for coagulase-positive penicillin-resistant staphylococci = 16.3%.

TABLE IV.—Routine Culture of Umbilical Swabs

Total Examined	Staphylococci Coagulase-positive	Staphylococci Coagulase-negative	No Staphylococci Isolated
121	73	20	28

Carriage rate:

Coagulase-positive staphylococci	= 60%
Penicillin-resistant coagulase-positive staphylococci	= 38.9%
Streptomycin-resistant	= 7.8%
Chloramphenicol-resistant	= 18.1%
Aureomycin-resistant	= 3.3%

Antibiotic Sensitivity of Coagulase-positive Staphylococci (73 Cases)*

	Penicillin				Streptomycin				Chloramphenicol				Aureomycin			
Sensitivity	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
No.	47	13	1	12	9	8	9	44	21	4	2	43	4	2	1	65
% resistant	64.4				12.9				30.0				5.5			

* Streptomycin and chloramphenicol sensitivity tests were not carried out on three cases and the aureomycin-sensitivity test was not carried out on one case.

TABLE V.—Comparison of Antibiotic Resistance of Staphylococci (Coagulase-positive) Isolated from Patients with Clinical Infections and Adults and Infant Carriers

Source	Penicillin	Streptomycin	Chloramphenicol	Aureomycin
Nasal swabs (staff)	30.7%	0.0%	0.0%	0.0%
Umbilical swabs (infants)	64.4%	12.9%	30.0%	5.5%
Clinical infection (infants)	76.6%	12.5%	17.4%	4.5%

antibiotics. The concentrations used were as follows: aureomycin 25 µg. per disk; penicillin, 1 unit per disk; streptomycin, 10 µg. per disk; chloramphenicol, 10 µg. per disk.

Results are expressed 0, 1, 2, or 3, corresponding with the diameter of the zone of inhibition: 0 represents resistance to the antibiotics in the concentrations noted above; 3 represents a high degree of sensitivity. The correlation between reported degrees of sensitivity, the size of the zone of inhibition, the coefficient of resistance of the tested organism, and the minimum inhibitory concentration of antibiotic is shown in Table VI.

During the period under review the staff nasal carriage rate for coagulase-positive staphylococci was 53%. Similar figures have been published for other units: 53% by Rountree and Thomson (1949), 50% by Felsen *et al.* (1951), and 56–68% by Barber *et al.* (1949). The percentage of nasal carriers of penicillin-resistant coagulase-positive staphylococci among the staff (16.3) compares with other figures 0–32% (Rountree and Thomson, 1949) and 40–54% (Barber *et al.*, 1949). Our figures for resistance refer only to organisms wholly resistant by the standard tests.

Our umbilical staphylococcal carriage rate of 60% for coagulase-positive organisms compares with neonatal carriage rates of 62% in the nasopharynx (Martyn, 1949) and 54% in the conjunctiva (Barber *et al.*, 1949), while the percentage of penicillin-resistant umbilical carriers (38.9%) compares

TABLE VI.—Approximate Relationship Between Conventions Used in the Text and (1) Coefficient of Resistance (Sensitivity of N.C.T.C. 6571 Staphylococcus/sensitivity of Tested Organism). (2) Minimum Inhibitory Concentration (µg./ml.)

Antibiotic	Degree of Sensitivity	Zone Diameter (mm.)	Coef. Resist.	Min. Inhib. Conc. (µg./ml.)
Aureomycin disk ≡ 25 µg.	3	>20	<4	<1
	2	12–20	4–40	1–10
	1	6–12	>40	>10
Chloramphenicol disk ≡ 10 µg.	3	>18	<1.6	<2
	2	13–18	1.6–7	2–10
	1	6–13	7–20	10–30
Penicillin disk ≡ 1 unit (1 unit = 0.6 µg.)	3	>20	<5	<0.15*
	2	12–20	5–20	0.15–0.6*
	1	6–12	20–50	0.6–1.5*
Streptomycin disk ≡ 10 µg.	3	>19	<3	<1.5
	2	12–19	3–10	1.5–5
	1	6–12	>10	>5

* Penicillin minimum inhibitory concentration expressed in units per ml. Conventions used: 3, highly sensitive; 2, moderately sensitive; 1, slightly sensitive; 0, resistant.

In the case of aureomycin and chloramphenicol the term "slightly sensitive" can be seen from the table to be equivalent to a minimum inhibitory concentration of over 10 µg. per ml. As serum levels greater than this are not normally attainable, these antibiotics are unlikely to be effective, when used systemically, against an organism reported as "slightly sensitive." With penicillin and streptomycin, however, the fact that an organism is reported as only "slightly sensitive" does not necessarily exclude the possibility of effective systemic treatment.

with a nasopharyngeal rate of 34% (Martyn, 1949) and a conjunctival rate of 43% (Barber *et al.*, 1949) for such organisms.

Of the staphylococci isolated from clinical infections 76.6% were penicillin-resistant. This compares with the reported figures of 53% (Rountree and Thomson, 1949), 53.4% (Rountree *et al.*, 1951), and 50% (Summers, 1952), for hospital staphylococcal infection in general.

A comparison of the antibiotic resistance of organisms isolated from adult staff, from routine umbilical swabs, and from clinical infections reveals a close correspondence between the latter two groups (Table V). This would suggest that in the production of septic lesions cross-infection within the nurseries is more important than infection from the staff.

Penicillin resistance is well recognized. Chloramphenicol and aureomycin resistance are so far much less common. The percentage of aureomycin-resistant organisms here agrees with the previous reports of Long *et al.* (1950) and of Fairbrother *et al.* (1951). Aureomycin has not been used nearly so extensively in this unit as chloramphenicol. Lowbury *et al.* (1952) have shown that the administration of aureomycin in a burns unit produced in a period of six months a rising incidence of aureomycin-resistant organisms and an increase in the degree of resistance of these organisms. They also showed that the routine oral administration of aureomycin did not reduce the nasal carriage rate of staphylococci, and that the percentage of aureomycin-resistant organisms among these staphylococci increased.

Only 12.5% of clinical infections were resistant to streptomycin. This drug thus retains its value where a bactericidal effect is required. On account of the speed with which resistance may be acquired we have used it rarely, and only in the presence of serious sepsis.

Dosage Employed

Throughout the period under review the dosage of antibiotics used has been standardized. Penicillin has been given by intramuscular injections of 50,000 or 100,000 units at intervals of four or six hours, according to the clinical indications. Depot penicillin has not been used.

We have given streptomycin (0.5 g. daily) by intramuscular injections at intervals of six or twelve hours.

Chloramphenicol and aureomycin have both been given by mouth as powder freshly removed from the capsule in a dosage of 50 mg. per lb. (110 mg. per kg.) daily. Adequate serum levels have been found previously with a dosage of 11 mg. per kg. daily of aureomycin and 44 mg. per kg. daily of chloramphenicol (Hunt *et al.*, 1950). These and other studies (Ross *et al.*, 1952) confirm that in young children such dosage can be expected to produce serum levels of 10 µg. per ml. even during severe infections. We lack knowledge of tissue levels in babies treated with the newer antibiotics. It would be of the greatest value in the proper assessment of therapeutic failure if these levels could be measured. We had supposed that free diffusion would occur to infected areas in bone, kidney, lung, and liver. Our present experience suggests that this is not necessarily so with the dosage used (Cases 3 and 4).

Discussion

The cases reported illustrate the dangers which may attend minor staphylococcal infection in the newborn. While the recognition of minor infection of the conjunctiva, the skin, and the umbilicus presents little difficulty, it may be difficult to determine when an infection has ceased to be local and external and has spread, as in Case 4, to involve deeper or more distant structures. In such cases the systemic response is often of value in differentiating a trivial infection from a more serious one. Inactivity, failure to feed, diminished crying, the onset of pallor, vomiting, and pyrexia, occurring in a baby who has suffered from minor staphylococcal infections are warning signs which should not be ignored. Where there is the possibility that the initial local infection has been overlooked or where an infant born in hospital has developed serious infection after returning home the awareness of the high incidence of minor staphylococcal infection in infants born in hospital and the knowledge that the majority of the staphylococci are penicillin-resistant should, in differential diagnosis, give serious staphylococcal infection its due place and should remind those responsible for treatment of the limitations of penicillin therapy.

In the control of antibiotic therapy the laboratory plays an important part, particularly in suggesting suitable treatment in individual infections both with regard to clinical result and to the avoidance of expensive drugs which may be ineffective. Broadly speaking, we have found that the *in vitro* assessment of antibiotic sensitivity has been paralleled by the clinical response to treatment with an antibiotic which was assessed as appropriate, but there have been individual variations to this, as in Cases 1 and 3. It is as well, therefore, to bear in mind the limitations of *in vitro* sensitivity tests and to be prepared to change the treatment on clinical grounds alone. It is often necessary, too, with an infection of the neonate to begin treatment before the bacteriological report and the result of sensitivity tests are available. Under such circumstances failure to respond to treatment is a much more significant clinical guide to the organism's sensitivity than rapid response, because of the frequency with which spontaneous improvement may occur.

On the basis of laboratory tests it is clear that resistance to antibiotics is an increasing problem, particularly in hospitals. There the high carriage rate of coagulase-positive staphylococci and the high incidence of drug resistance constitute a special danger to the peculiarly susceptible newborn baby.

From the point of view of therapy the frequent difficulty of judging the severity of clinical infection, the natural tendency of so many lesions to heal without treatment, the occasional lack of correspondence between *in vitro* sensitivity tests and *in vivo* response, the time lag before the result of the bacteriological examination becomes available, the occurrence of drug resistance, and the danger of ultimately inducing this make a logical approach difficult.

The prophylactic use of penicillin in hospitals had its advocates before the extent of resistance to it became so widely recognized. More recently it has been suggested that

aureomycin should be used in this way (Felsen *et al.*, 1951). In the knowledge of the dangers of drug resistance this practice can scarcely be justified.

The majority of minor staphylococcal infections heal without treatment. Records of such infections, and in particular accurate bacteriological data, may assume great significance in the light of any subsequent illness which the child may develop during the following weeks. For mild skin lesions antibiotic therapy is probably not indicated, local treatment with an antiseptic such as gentian violet usually being sufficient. With purulent conjunctivitis the position is rather different. The amount of infected pus to which such a lesion gives rise must be responsible for the heavy contamination of clothes, floors, dust, air, and personnel. There is thus a case for controlling such lesions as early as possible. We have found local therapy with sulphacetamide, chloramphenicol, or aureomycin eyedrops, instilled at minute intervals for 30 minutes and thereafter every half-hour for 36 hours, effective in the majority of cases. Most infections clear within a few hours, but stubborn infections may require more than four days' systemic therapy.

The development of more serious sepsis often occurs after the child has returned home, and confronts the general practitioner in the first place. When diagnosis is difficult the fact that a baby has recently been discharged from a hospital maternity unit should bring the possibility of staphylococcal infection to mind, and such infection becomes increasingly likely if he is known to have suffered previously from a minor staphylococcal lesion. When the diagnosis is not in doubt the difficulty may be in determining the severity of the infection.

In view of its widespread use penicillin will doubtless tend to be given early. Because of the synergism which exists between the two drugs there is a case for giving streptomycin in addition (Alexander *et al.*, 1950). These drugs produce a combined bactericidal effect, and if no improvement is manifest within 24 hours the baby should probably be admitted to hospital or treated with another antibiotic, such as chloramphenicol or aureomycin.

The ultimate disposal of such cases depends very much upon the hospital facilities available in the area. Where adequate facilities exist serious staphylococcal infection merits hospital admission without the delay incurred by a therapeutic test.

In hospital practice we now find that penicillin is only of very limited value in the treatment of neonatal staphylococcal infection, whereas chloramphenicol and aureomycin give satisfactory results. The fact that aureomycin and chloramphenicol are bacteriostatic drugs, however, is probably responsible for the relapses which may follow early cessation of treatment, as in Case 3, and which make it very difficult to decide on the length of time that treatment should be continued. Apparent cessation of activity as judged clinically is not necessarily an indication for stopping therapy, particularly in deep-seated infections such as osteomyelitis. Nor do the newer antibiotics abolish the necessity for surgical intervention in certain cases: this is still often necessary to eradicate foci of infection to which, on account of the poor blood supply, systemically administered drugs have little access.

There is evidence that the staphylococcus is beginning to acquire resistance to the newer antibiotics as it has done to penicillin. At present, however, the use of combinations of antibiotics and the introduction of new antibiotics are keeping pace with the development of drug resistance.

Summary

The incidence of skin sepsis in two maternity units was 2.3% in each case and of conjunctival sepsis 4.1% and 4.2%. Most of these infections were due to the staphylococcus.

Cases are described illustrative of the serious lesions which staphylococcal infection may produce in the neo-

natal period, and comments are made on these cases, with particular reference to drug-resistant organisms, to bacteriological control of therapy, and to the difficulties of diagnosis and management.

An analysis has been made of the antibiotic sensitivity of organisms isolated from 56 separate staphylococcal infections occurring in a maternity unit during the year 1951: 76.6% of these were resistant to penicillin, 12.5% to streptomycin, 17.4% to chloramphenicol, and 4.5% to aureomycin.

Nasal swabbing of the staff in this maternity unit showed that the carriage rate for coagulase-positive staphylococci was 53.0%, and out of these 30.7% were penicillin-resistant. None was resistant to chloramphenicol or aureomycin.

Routine swabs from the umbilicus just after the cord had separated showed that the infant carriage rate for coagulase-positive staphylococci was 60.0%, and that of these 64.4% were penicillin-resistant, 12.9% streptomycin-resistant, 30.0% chloramphenicol resistant, and 5.5% aureomycin resistant.

On the basis of relative drug resistance it is suggested that cross-infection may be more important in the production of neonatal staphylococcal lesions than infection from the attendant nursing staff.

Staphylococcal infections are discussed as they occur when the newborn infant is in hospital and when he has returned home. Particular reference is made to the significance of minor staphylococcal infection, to the importance of bacteriological investigation, to the type and dosage of antibiotic to be employed, and to the regimes of treatment which may be adopted under different circumstances.

We wish to thank the consultant obstetricians and the maternity and children's ward nursing staffs of the two hospitals concerned for their co-operation; Mr. J. J. Mason Brown for permission to quote Case 1; Professor T. J. Mackie and Dr. Helen A. Wright, Bacteriology Department, University of Edinburgh, for advice and facilities; and the university bacteriology technical staff.

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A roll of health visitor tutors is to be set up shortly by the Royal College of Nursing, at the request of the Standing Conference of Representatives of Health Visitor Training Centres. The roll is for the guidance of local authorities and others responsible for appointing tutors in health visitor training centres.

A STUDY OF TWO UNUSUAL BLOOD-GROUP ANTIGENS IN WEST AFRICANS

BY

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In 1948 an investigation of the blood groups of Nigerian populations was begun and full ABO, MNS, and Rh genotype studies of some 550 Nigerians have been completed (Chalmers, Ikin, and Mourant, 1953). Early in this work two samples of blood—one from an Efik (Calabar) man and one from a native of the Cameroons—were found to be unusual. Both bloods were agglutinated by all available anti-N sera, but were agglutinated only by one out of several anti-M sera with which they were tested. This finding was briefly described by Ikin and Mourant (1951), who suggested that the antigen concerned might be identical with one described by Landsteiner, Strutton, and Chase (1934) as occurring in some American negroes.

Present Investigation

During the past two years we have been fortunate in getting generous samples of blood from one of the above-mentioned Nigerians, Mr. E. G. D. Henshaw, who is a laboratory technician in the Nigerian Medical Service, and who has been most helpful in this investigation, both as a donor and in arranging for the study of his relatives and other Nigerians.

It was not found possible by absorption of the exceptional anti-M serum with normal M cells to prepare a serum which was specific for the peculiar antigen, provisionally called the Henshaw, or He, antigen. It was therefore decided to give injections of the red cells of the original donor to eight previously unimmunized rabbits. After two courses of six daily injections each, all the rabbits were found to have made a specific anti-He antibody, readily separated by absorption with European A₁MN red cells from other antibodies present in the serum. After further courses of injections the titres of the sera of most of the rabbits rose and the sera gave clear-cut results by a tile technique, although the original tube technique was used wherever possible. A few further West Africans tested with the "new" antiserum gave positive reactions, and through the kindness of Dr. David Cannon and Dr. Andrew Kertesz, who sent us blood samples from Lagos, we were also able to show the presence of the antigen in several relatives of a person in whom it had previously been detected. At this stage we had already begun to suspect a connexion with the MNS blood-group system (Sanger, Race, Walsh, and Montgomery, 1948). It was therefore decided that one of us (J. N. M. C.) should make an expedition to West Africa in order to study the incidence and genetics of the antigen. Thanks to the local facilities given by various medical colleagues, it was possible to carry out tests with the anti-He serum on a series of 1,428 "random" blood samples from West African hospital patients and others, in Nigeria and the Gold Coast. Specimens from the majority of the positive reactors and from members of families of many of them were sent by priority air transport (with the kind co-operation of Sir Harold Whittingham, D.M.S., B.O.A.C.) to London for further investigations.

Shortly before this, through the kindness of Dr. Merrill W. Chase, we also obtained from America specimens of the rabbit serum prepared some 18 years previously by Landsteiner, Strutton, and Chase, together with samples of the red cells of the original negro propositus, Mr. C. Hunter, and some other positive reactors. The antigen described by the American workers has been named the Hunter factor (see Boyd, 1939) and is referred to subsequently as Hunter, or Hu. The serum, after absorption with European A₁MN cells, was found to be active and specific. The Hunter antigen was shown to be distinct from the Henshaw antigen. Specimens sent from West Africa to London were tested with anti-Hunter; there was insufficient of the serum to use for field work in West Africa.

The results of tests with the anti-Henshaw serum carried out on unselected Africans in Lagos, Calabar, and Kano (Nigeria), and Accra (Gold Coast) showed 38 positives in a total series of 1,428. This gives an overall frequency of the Henshaw antigen of 2.7% for this series. Positive reactors were found in many different tribes in both Colonies, but data on tribal incidence will not be considered in the present paper. Numerous members of the families of Henshaw-positive reactors were tested in the field with anti-Henshaw serum, but as tests with the anti-Hunter serum were carried out only in London, relatively few persons were tested with the latter serum, and of these only 138 could be regarded as unselected from the genetical point of view. Individuals so regarded were those from whom specimens were sent to London without any preliminary testing of themselves or their relatives, and those marrying into the families of selected He-positives but who would not themselves have been tested except for the fact of such marriage. Thirty of these people, or 21.7%, were found to be Hunter-positive. Owing to the relatively high general incidence of the Hunter antigen it was fortunately present in a large number of the African families selected for genetical investigation.

So far as the size and state of preservation of the specimens received in London allowed, they were also tested with anti-A, anti-A₁ where relevant, anti-B, anti-C, anti-D, anti-E, anti-c, anti-M, anti-N, anti-S, anti-s (generously supplied for the purpose by Dr. P. Levine), anti-P, anti-Lu^a, anti-Le^a, and anti-Le^b. Bloods positive with anti-E were tested with anti-e. The anti-C serum used actually had the specificity anti-C + anti-C^w; all specimens positive with this serum were tested with pure anti-C^w, but the results were uniformly negative.

Dr. Winifred Watkins, of the Biochemistry Department, Lister Institute, has examined the effect of periodate on the reactions of the Henshaw antigen as found on the surface of intact red cells, and has kindly allowed us to quote her results. Morgan and Watkins (1951) had previously shown that the M and N antigens, like the D antigen of the Rh system, are rapidly inactivated by periodate, whereas A, B, H, Le^a, and P are inactivated much more slowly. It has now been found that the Henshaw antigen, like M and N, is rapidly inactivated. The effects of periodate on the S and s antigens are unknown.

Relations to Other Antigens

From a consideration of the unselected material both from Africans and from African families there seems to be a close connexion between both the Henshaw and Hunter antigens and the MNSs system. There are no obvious relations with the other blood-group systems, but the material, together with further samples from "He-positive" families, is being analysed in detail for possible connexions. In this paper only relations with the MNSs system are considered.

Statistical Relations

In the course of this work and that which led up to it (Chalmers, Ikin, and Mourant, 1953) the MNS blood groups have been determined for a number of West Africans falling into three categories: (1) 326 Nigerians selected solely because of presumed unmixed Nigerian ancestry; (2) 33

West Africans, mostly Nigerians, selected as being Henshaw-positive; and (3) 26 West Africans, mostly Nigerians, selected as being Hunter-positive.

The results of these tests are shown in the Table. A few specimens from known Henshaw-positives and Hunter-

Incidence of the MNS Blood Groups in Unselected West Africans and in Henshaw-positives and Hunter-positives

MNS Phenotype	Unselected Nigerians	Henshaw-Positives	Hunter-Positives
MMS	23	0	0
MsMs	55	0	0
MNS	45	15	6
MsNs	121	0	5
NNS	16	17	1
NsNs	66	1	14
Total	326	33	26

positives, because they were inadequate, were not fully tested for the antigens of the MNSs system. It is for this reason that the numbers given here are smaller than the totals already stated.

All 33 Henshaw-positives were found to carry the N gene, whereas among the unselected class only 248 out of 326 carried it. The probability of such a distribution occurring by chance if the Henshaw and N antigens were unrelated is about 1 in 1,000.

Of the Henshaw-positives 32 out of 33 had the S antigen, while only 84 out of the 326 unselected persons had it. The probability of such a chance occurrence is 1 in 10^{11} . If the subdivisions chosen are (1) N and S both present; and (2) N, S, or N and S absent, the probability of chance occurrence is found to be, if possible, even less: 1 in 10^{22} . A regular relation of the Henshaw antigen to the MNS system is thus completely established.

All of the 26 Hunter-positives carried the N gene. The probability of this occurring by chance if the Hunter and N antigens were unrelated is about 1 in 200. Consideration of the S antigen adds little to the argument, but the relation of the Hunter antigen to the MNS system is very firmly established.

Such statistical considerations do not directly determine the nature of the connexions between the antigens concerned, but the only hypothesis which seems to be capable of explaining the observations is that the genes for the Henshaw and Hunter antigens are each linked to the genes of the MNS system in the close manner characterizing the CDE complexes of the Rh system. It should be noted that only a very close linkage with a cross-over frequency not exceeding about 1 in 1,000 can explain these results, hence crossing over should be found absent or almost completely absent in any series of family data.

Family Data

The next step in the investigation was to test the above hypothesis on families. An effort was made to obtain specimens of blood from as many relatives as possible of all Henshaw-positive propositi. Tests were made in London with all available grouping sera, including anti-Hunter. In every case in which both parents of a He-positive person were tested, one was He-positive, this being characteristic of a Mendelian dominant character. The Hu antigen showed similar behaviour. As expected from the individual data, the only obvious linkages of the Henshaw and Hunter genes are with the MNSs system, and only these relations are described here. A full linkage analysis of the material is, however, being carried out and a report on it will be published elsewhere.

Ten families in all were tested, varying from two individuals to 38 extending over four generations. Some of the families were highly complex owing to many of the men and women each having had several partners. In one or two instances an unexpected result was obtained, but it is likely that erroneous information with regard to family relationships was the explanation.

In nearly every case, however, the data are consistent with complete linkage (as found in the Rh system between the genes at the C, the D, and the E loci) between the Henshaw gene and NS or Ns, and between the Hunter gene and Ns or (each in one family only) NS or Ms. Two families which show the relationship especially clearly are illustrated in the Diagram. All individuals in these families were tested with anti-M, -N, -S, and -s.

In the Bo. family the MNSs genotypes are each directly fixed by the serology except those of the mother and the eldest child.

Since two of the children are homozygous NS/NS, the mother must carry NS and is therefore Ms/NS. The eldest child has therefore received s with M from his mother and is also Ms/NS.

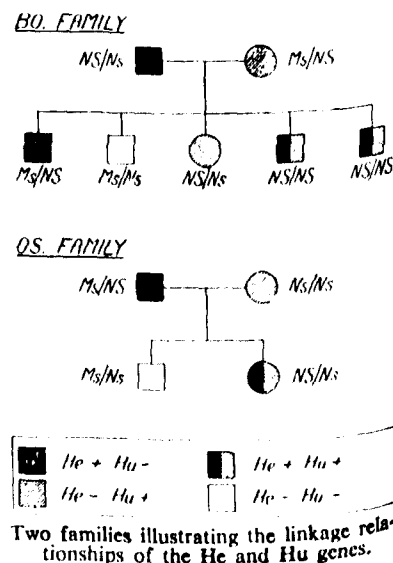
Without making use of our knowledge of the Henshaw and Hunter observations we can moreover determine from which parent each child received each one of its MNSs chromosomes. It then follows that every child receiving NS from the father also received the Henshaw antigen and each getting his Ns did not receive Henshaw. Similarly, each child with NS from the mother has the Hunter antigen and each with the mother's Ms failed to receive Hunter.

In the Os. family the MNSs genotypes of the mother and of both children are completely determined by their serological phenotypes. Since the second child is of the genotype NS/Ns she must have received the S gene with N from her father, who is therefore Ms/NS. Hence the Henshaw gene was transmitted from the father along with the NS combination and the Hunter gene with the Ns from the mother. The elder child received the father's Ms chromosome without his Henshaw antigen and an Ns chromosome without the Hunter antigen from the mother. Since the mother has two Ns chromosomes, one of these presumably carries the Hunter gene and the other does not. The data are thus consistent with a linkage between Ns and Hu, but cannot be used to prove it.

The Henshaw antigen has also been detected in a very small number of individuals in the Far East. In two Sea Dyaks from Borneo it appears to be linked to MS, while in Negritos from Malaya it accompanies Ms (P. Sneath, 1952, unpublished observations). A total of 1,500 Europeans have so far been tested for the Henshaw antigen with uniformly negative results.

We thus have very strong evidence that the Henshaw antigen is closely linked to the genes for M or N and S or s. The Hunter antigen is also similarly linked. We have, so far, no clear evidence of whether the genes for the two newly described antigens are or are not alleles of one another. In the few families in which both occur the two segregate separately, but this does not rule out the possibility that they may be alleles—a possibility which could be disproved if they were found to segregate together in a family. The only slender piece of evidence in favour of the coexistence of the two new genes on a single chromosome is the finding of two unrelated West Africans both of phenotype MNSs and positive for both Henshaw and Hunter antigens. If the genes for both of the latter key to their partnership with N, which is otherwise almost invariable among Africans tested, then both genes must be on one chromosome. It unfortunately has not been possible to obtain specimens from their families.

The Henshaw and Hunter antigens are for the moment unique among well-established human blood-group antigens in that the corresponding antibodies have never been found



Two families illustrating the linkage relationships of the He and Hu genes.

in human sera. It is, however, probable that as blood transfusion and serological testing become commoner in Africans such human antibodies will be found, and it is not improbable that there will be occasional clinical manifestations of incompatible blood transfusion and even of haemolytic disease of the newborn arising from the corresponding antigen-antibody reactions.

Summary

An investigation has been carried out into the distribution in West Africa and the genetics of the Hunter antigen of Landsteiner, Strutton, and Chase (1934) and of the newly discovered Henshaw antigen. The genes for both of these antigens appear to be closely linked to those of the MNSs blood-group system.

Thanks are due to the Rockefeller Foundation for a grant given to one of us (J.N.M.C.) in defrayment of part of the expenses. We wish to thank Dr. Ada C. Kopec for statistical advice, and Miss P. J. Brooks, Miss K. E. Garner, and Mr. Kenneth Rogers for technical assistance in London. In West Africa, the I.G., Medical Services, Nigeria, and the D.M.S., Gold Coast, and their staffs gave every facility for work there. In particular we thank Dr. D. A. Cannon, Dr. G. M. Edington, Mr. S. O. Williams, and Mr. E. G. D. Henshaw.

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USE AND EFFECTIVENESS OF ANTIMALARIAL DRUGS

EXPERIENCE OF NON-NATIVE RESIDENT POPULATION OF NIGERIA, WEST AFRICA

BY

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Colonial Medical Service, Nigeria

The question most often put to the medical profession by European and other expatriates resident in West Tropical Africa is, "What antimalarial drug should I and my children take, and in what dosage?" The claims made in advertisements, the advice of friends, and the recommendations of employers conflict and confuse. More often than not the doctors themselves disagree, and recent comment in the medical press is even more confusing and conflicting (*British Medical Journal*, 1949; *Colonial Med. Res. Com.*, 1949; Covell, Nicol, Shute, and Maryon, 1949a, 1949b; Davey and Smith, 1949; Garnham, 1949; Bruce-Chwatt, 1951; MacLeod, 1951; Messent, 1951; Manson-Bahr, 1952).

In view of this present disagreement on the part of the medical profession an inquiry into the use and effectiveness of antimalarial drugs was conducted in Lagos in 1951 and 1952, employing the past and present experience of a group of non-natives resident in Nigeria as a yardstick. A study with the same object in view was carried out in 1948 and 1949 by the Bruce-Chwatts (1950). They collected data by sending questionnaires to all doctors practising clinical medicine within the Colony and Protectorate. The investigation here reported was carried out by personal interview with a group of expatriates, many of whom lived in and around Lagos.

Method

The group investigated was composed of all the non-natives who reported to my out-patient clinic at the Creek Hospital, Lagos, between November 1, 1951, and March 31, 1952, irrespective of the complaint which brought them to hospital. Each individual was questioned regarding the following particulars:

Nationality, age, sex.

Antimalarial drug at present being taken: name of drug, dose, duration, and regularity of taking it.

Previous history of malaria while taking this drug. If present, was malaria diagnosed by a doctor, with or without laboratory confirmation, or by the individual himself?

Antimalarial drug, if any, used in the past: name, dose, duration, and regularity of taking it, previous history of malaria, grounds for diagnosis (see above), and reason for changing to another drug.

The age, sex, and nationality distributions of the sample of the non-native population of Nigeria, numbering 531 in all, are set out in Table I.

An estimate of the incidence of malaria in the group at the time of interview was made as follows. If a patient was found to be pyrexial or to present any clinical feature raising the question of the differential diagnosis of malaria, a thick blood film was made and sent to the laboratory. "Clinical malaria" was diagnosed on those occasions when the report on the film was negative, but the history and examination suggested malaria and the response to therapeutic doses of mepacrine or chloroquine was satisfactory. The possibility that cases of influenza and other short-term spontaneously remitting fevers were included as clinical malaria cannot be ruled out, nor can it be stated that all cases of parasitaemia were discovered by these simple methods; it is believed, however, that a reasonably good estimate of the incidence of overt malaria was obtained.

Blood films were made for the reasons mentioned above from 78 of the 441 patients aged 10 and over, and from 17 of the 90 children under 10 years. The infecting organism in all the blood films reported as positive was stated to be *Plasmodium falciparum*.

Results

The antimalarial drugs in use by the individuals forming the sample of the non-native population at the time of interview are shown in Table II; it will be seen that proguanil was used at all ages more often than any other drug. Proguanil was the drug chosen by the majority of all races except the Lebanese, Syrians, and French, who prefer quinine to any other antimalarial drug. A bigger proportion of the French (16%) than of any other race took chloroquine.

Changes from One Drug to Another

Many individuals, regular takers of an antimalarial drug, were found to have changed for various reasons from one drug to another during the course of their stay in West Africa. Among adults the swing was away from quinine or mepacrine to proguanil or chloroquine (Table III). An increase in the dosage of proguanil from 100 mg. to 200 mg. daily had also occurred. Such changes indicate dissatisfaction with the drug initially taken.

The reasons given for stopping quinine were repeated attacks of "fever" (80%), dyspepsia, and tinnitus. In 89% of cases the reason given for relinquishing mepacrine was the yellow staining of the skin, but gastric upsets were also blamed by a small number of patients. The sole reason given for increasing the dose of proguanil, or for changing to another drug, was the occurrence of fever while taking the lower dose. Proguanil was never given up as a result of loss of appetite (*British Medical Journal*, 1949; Shearer, 1949). Proguanil in doses of 200 mg. daily and chloroquine 300 mg. twice or thrice a week were found satisfactory by the few who have taken them regularly and without change since starting to live in the Tropics.

TABLE I.—Age, Sex, and Nationality Distribution of the Group of Non-natives Resident in Nigeria Investigated in 1951-2

Nationality	Age in Years												Total No.	
	0-9		10-19		20-29		30-39		40-49		50-59		60+	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
British	31	32	0	3	62	41	103	34	55	14	10	1	262	125
Dutch	8	0	0	0	7	3	12	1	2	0	1	0	31	4
Lebanese	5	4	0	2	5	6	5	0	0	1	0	0	19	13
French	1	3	0	1	9	1	6	2	0	0	0	0	16	7
Syrian	3	2	0	0	5	0	2	0	0	0	1	0	11	2
Greek	0	0	0	0	7	1	0	0	1	0	0	0	8	1
Swiss	0	0	0	0	4	1	0	0	0	0	0	0	4	1
Czech	1	0	0	0	0	2	0	0	1	0	0	0	2	3
Cypriot	0	0	0	0	4	0	0	0	0	0	0	0	4	0
German	0	0	0	0	0	1	2	0	0	0	0	0	2	2
Others*	0	0	0	0	3	0	6	1	3	1	0	0	12	2
	49	41	0	6	106	56	136	38	62	17	14	2	371	160

* Fourteen nationalities are represented in this subgroup.

TABLE II.—Antimalarial Drugs Used by the Group of Non-natives Resident in Nigeria at the Time of the Interview, by Age

Antimalarial Drug, and Dosage being Taken	Less than 1 Year	1-2 Years	3-4 Years	5-9 Years	10-19 Years	20 Years and Over	Total No.	% of Total
Proguanil:								
25 mg. daily	4	1	0	0	0	0	5	67.8
50 " " " " " " " "	6	10	5	2	1	0	24	
100 " " " " " " " "	0	9	14	12	3	0	38	
200 " " " " " " " "	0	0	0	0	0	0	0	
Mepacrine:								
100 mg. daily	0	0	0	0	0	0	0	5.6
Quinine:								
1 or 1½ gr. daily	2	3	0	0	0	0	5	
2 or 2½ " " " " " " " "	0	6	2	6	0	0	14	
4 or 5 " " " " " " " "	0	0	2	0	0	0	2	16.4
Lacquin:								
¼ or 1 dr. " " " " " " " "	5	0	0	0	2	59	63	
Chloroquine*:								
300 mg. 2 or 3 times weekly	0	0	0	0	0	0	0	1.7
150 mg. 2 or 3 " " " " " " " "	0	0	0	0	0	8	8	
Intermittent takers of:								
Proguanil	0	0	0	0	0	0	0	
Mepacrine	0	0	0	0	0	29	29	8.3
Quinine	0	0	0	0	0	6	6	
Nothing	0	0	0	0	0	1	1	
								0.2

* All doses of chloroquine refer to "base" and not "salt."

TABLE III.—Changes from One Antimalarial Drug to Another Which Have Taken Place in the Non-natives Resident in Nigeria 20 Years of Age and Over who are Regular Takers of One or Other of these Drugs

Drug Initially Taken, and Dosage	No. Starting on this Drug	No. Changing to					No. now Taking	% Unchanged
		Proguanil 100 mg. Daily	Proguanil 200 mg. Daily	Mepacrine 100 mg. Daily	Quinine 4 or 5 gr. Daily	Chloroquine 300 mg. 2 or 3 Times Weekly		
Proguanil:								
100 mg. daily	235	0	27	1	2	2	245	86
200 " " " " " " " "	15	0	0	0	0	0	48	100
Mepacrine:								
100 mg. daily	46	20	2	0	2	1	30	46
Quinine:								
4 or 5 gr. daily	91	22	4	8	0	2	59	60
Chloroquine:								
300 mg. 2 or 3 times weekly	3	0	0	0	0	0	8	100

The overall figures show that 60% of those starting on quinine have remained faithful to it, 46% to mepacrine, and 86% to a dose of 100 mg. of proguanil. The remainder have thought fit to try a different antimalarial drug.

Incidence of Malaria Prior to the Interview

The data presented in Table IV were obtained from individuals who had taken only one antimalarial drug, and this regularly, since starting to live in Nigeria. They depend upon such doubtful factors as the patient's memory and knowledge of the method of diagnosis of his or her case. Making due allowance for these factors, it was still apparent at the interview that many non-native adults taking 4 or 5 gr. (260 or 320 mg.) of quinine, 100 mg. of mepacrine, or 100 mg. of proguanil daily had suffered from

repeated attacks of malaria in the past. A previous history of malaria was reported by 50% of those patients who had never changed from quinine, the corresponding figures for those taking mepacrine and proguanil being 15% and 17%. The difference is statistically significant ($P=0.01$), but it is necessary to remember that the group taking quinine had been exposed to infection for much longer periods of time, on the average, than had those taking the other two drugs. The figures given in Table IV, however, indicate that this factor does not account for the higher incidence of malaria among those using quinine.

A previous history of malaria was not obtained from anyone who had been taking either a daily dose of 200 mg. of proguanil or 300 mg. of chloroquine twice or thrice a week, but in these subgroups the numbers are small and the length of exposure to infection was short.

Incidence of Malaria Discovered at the Interview

The overall incidence of malaria among the group of adult patients who had taken one or other of the antimalarial drugs regularly was found to be 8% (Table V). The figure of 8.2% for those taking 100 mg. of proguanil daily agrees well with that reported by the Bruce-Chwatts (1950). A significant difference does not exist between the

TABLE IV.—Incidence of a Past History of Malaria in Non-native Residents in Nigeria 20 Years of Age and Over, Regular Takers of Only One Antimalarial Drug, Time the Drug has been Taken, and the Distribution of Malaria Throughout this Period

Antimalarial Drug and the Daily Dose*	No. Taking	% Reporting Proved Malaria	% Reporting Clinical Malaria	Mean Duration of Taking Antimalarial Drug
Proguanil:				
100 mg.	203	6	9	3.6 years
200 " " " " " " " "	15	0	0	0.7 year
Mepacrine:				
100 mg.	21	14	3	4.9 years
Quinine:				
4 or 5 gr.	55	35	15	7.1 "
Chloroquine:				
300 mg.	3	0	0	0.5 year

* Dose of chloroquine is taken twice or thrice weekly, not daily.

TABLE V.—Incidence of Malaria in Non-natives 20 Years of Age and Over Resident in Nigeria Found at the Interview, and the Antimalarial Drug being Taken at the Time

Antimalarial Drug and Dose	No. Taking	No. with Positive Blood Film	No. with Diagnosis of Clin. Malaria	% with Positive Films	Total % Malaria
Proguanil:					
100 mg. daily	245	11	9	4.5	8.2
200 mg. " " " " " " " "	48	0	0	0	0
Mepacrine:					
100 mg. daily	30	1	2	3.3	10.0
Quinine:					
4 or 5 gr. daily	59	4	4	6.8	13.6
Chloroquine:					
300 mg. twice or thrice weekly	8	0	0	0	0
Intermittent:					
Proguanil	29	5	3	17.3	27.6
Mepacrine	6	1	2	16.7	50.0
Quinine	9	1	2	11.1	33.3
Nothing	1	1	0	100.0	100.0
	435	24	22	5.7	10.6

TABLE VI.—Incidence of Malaria in Non-native children Resident in Nigeria Less than 10 Years of Age, as Diagnosed at the Interview, and the Antimalarial Drug being Used at the Time

Antimalarial Drug and Dose*	No. Taking	No. with Positive Blood Film	No. with Diagnosis of Clin. Malaria	% with Positive Films	Total % Malaria
Children 1 to 9 years					
Proguanil:					
25 mg.	1	0	0	0	0
50 " " " " " " " "	17	1	3	6	24
100 " " " " " " " "	35	0	1	0	3
Quinine:					
1½ to 2½ gr.	17	1	3	6	24
4 or 5 gr. " " " " " " " "	2	0	0	0	0
Chloroquine:					
150 mg.	1	0	0	0	0
Children under 1 year of age					
Proguanil:					
25 mg.	4	1	0	25	25
50 " " " " " " " "	6	0	0	0	0
Quinine:					
1 or 1½ gr.	2	0	0	0	0
Lacquin:					
¼ or 1 dr.	5	0	0	0	0

* The dose in the case of chloroquine is taken thrice weekly.

incidence of malaria discovered in the groups of patients taking 100 mg. of proguanil, 100 mg. of mepacrine, or 4 or 5 gr. (260 or 320 mg.) of quinine. The evil effects of using any of these drugs intermittently are clearly demonstrated in Table V.

The data obtained from children under 10 years are set out in Table VI. Although few in number, the figures suggest that proguanil in adequate doses is a satisfactory antimalarial drug for this group. For infants 1 to 1½ gr. (65 to 100 mg.) of quinine seems to be an efficient prophylactic dose.

Discussion

Past experience with antimalarial drugs in Nigeria has led many of the individuals included in this investigation to relinquish quinine or mepacrine in favour of proguanil or chloroquine. The high incidence of a previous history of malaria in the group initially taking quinine provides good reason for the swing away from this drug, but no such reason exists in the case of mepacrine. The yellow discoloration of the skin associated with the regular use of mepacrine provided most of the Europeans with a ready excuse for changing to something else.

The incidence of malaria discovered in those patients taking quinine at the time of the interview was not significantly higher than that among patients taking 100 mg. of proguanil or of mepacrine. This fact cannot be used as an argument to offset the high incidence of the disease in the past histories of those taking quinine. It was impossible to decide if the cases of malaria encountered at the time of the interview were fresh infections or were relapses of earlier infections.

The information disclosed by this investigation indicated that malaria will occur in about 10% of those using a daily dose of 100 mg. of proguanil, but that daily doses of 200 mg. of proguanil or doses of 300 mg. of chloroquine twice or thrice a week provide efficient prophylaxis against the subtertian malaria endemic in Nigeria. In the experience of the group of people which has been studied, and in my own and that of my family, the higher dose of proguanil causes no unpleasant side-effects.

It is impossible to say whether the high dosage of proguanil recommended as a result of this investigation is necessitated by a developing resistance of the local strains of plasmodium to this drug or if the dosage used in the past was too small to accomplish efficient prophylaxis.

Conclusions

The data presented and discussed lead to the general conclusion that, in the present state of knowledge and in view of past experience, proguanil in adequate dosage is the most satisfactory drug to use in Nigeria at the present time for the prevention of malaria. Chloroquine has been taken by so few people, and for such a short time, that it would be unwise to draw any premature conclusions about its efficiency, but the information so far available is of a satisfactory nature. The conclusion that a daily dose of 100 mg. of proguanil or of mepacrine is more effective as a suppressant than 5 gr. (320 mg.) of quinine against the local strains of *P. falciparum* is based upon good evidence.

Proguanil, in daily doses of 200 mg. for those 10 years of age and over and 50 mg. for children under the age of 1 year, with proportionate intermediate doses, is an efficient prophylactic. Quinine in daily doses of 1 to 1½ gr. (65 to 100 mg.) is satisfactory for infants.

These conclusions are not intended to belittle the importance of applying all the other means available to prevent infection being acquired by the non-immune population of Nigeria.

Summary

An account is given of an investigation carried out in Lagos, Nigeria, which was designed to discover which of the many available antimalarial drugs are being, and

FEMALE FERTILITY

BY

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In 1866 Matthews Duncan noted that "whilst a large number [of women] are fertile for a first time in each of the first three years of married life, only 7% of the fertile bear children after three years of marriage." From this it has been concluded by most British authors that sterility should be investigated after three years of marriage. In the United States of America most of the gynaecological textbooks suggest that two years of potentially fertile coitus should elapse before investigation. This may well be due to the work of Pearl (1939), who concluded, after investigating the case records of 199 white American women, that it took a woman, on an average, 24 months to conceive.

Recent editions of American and British textbooks voice this confusion. Four give four years as the time which should elapse before investigation of sterility, five give three years, three give two years, and two give one year. The others give no time. It is noted that those writers who have made a special study of the problem tend to investigate infertility after a shorter time than the others. As an example of this, Meaker's (1934) definition of infertility may be quoted. He defines sterility as "the inability to initiate the reproductive process on the part of a couple who have desired and attempted to reproduce for a reasonable length of time, ordinarily at least one year."

The incidence of infertile couples is estimated variously as between 8.5 and 15% of all marriages. In these unsettled times it becomes more important to determine the average length of time between the desire to conceive and the actual conception, so that those who exceed this average may be investigated with the minimum of delay. For nowadays, with poor housing conditions, voluntary contraception, occupations which entail longer or shorter periods of separation of the couple, later age of marriage, and impending separation for military reasons, those who are anxious to conceive should be helped as much as possible. As time passes and a woman still finds herself barren, much marital unhappiness and stress (which Stallworthy (1948) contends is itself a factor in infertility) accrues, and it is little comfort to her to be told by her doctor to "go away and don't worry, for you are still young."

That the fertility of a woman is related to her age has been believed from the time of Matthews Duncan onwards. In his investigations in Glasgow in 1866 he found that while 90% of women between the age of 20 and 24 would conceive for a first time within two years of marriage, only 63% of women between the ages of 30 and 34 and only 15% of women between the ages of 40 and 44 would do so. The Royal Commission on Population (1949) also gives interesting figures regarding the decline of fertility and the duration of marriage. It appears that the risk of conception in the second five years of marriage is reduced to about 50% of the risk in the first five years, and is again halved in the third five years.

Fertility in Salford

This survey was therefore undertaken in order to determine the average interval between the desire to conceive

and the conception itself. All the patients were primigravidae attending the antenatal clinics of Hope Hospital, Salford, between August 1, 1950, and June 1, 1951. In all, 1,202 women were interviewed. If conception had occurred within nine months no further questions were asked regarding coital habits, contraceptive technique, or absence of the husband from home. But when conception had been delayed for a longer period than this, all these points were studied and allowance was made for them. Later all the women were examined physically and further questions were asked as a check. In 136 cases (11.3% of the total) for contraception or coitus interruptus had been practised for longer or shorter periods, and the calculation was made from the date of abandoning these methods and desiring to conceive. There is no evidence to show that contraception, by whatever method used by these women, is harmful to fertility.

The results of the survey are shown in the Table. If women who conceived prenatally are included it can be seen that 90.25% of those studied were pregnant within

Desire-to-Conception Interval in Months	Age at Time of Desiring to Conceive						% Pregnant	Total
	15-19	20-24	25-29	30-34	35-39	40 and Over		
Prenuptial conceptions	86	96	18	7	4	0	17.5	211
0-3	54	263	112	20	3	3	38.0	455
3-6	26	116	62	13	3	1	18.5	221
6-9	5	52	32	15	6	2	9.25	112
9-12	2	40	27	5	7	2	7.0	83
12-18	0	10	10	6	1	0	2.25	27
18-24	0	5	7	8	0	0	1.5	20
24-36	0	5	12	2	0	0	1.5	19
36+	0	5	24	19	6	0	4.5	54
	173	592	304	95	30	8	100	1,202

one year of desiring to conceive, 92.5% were pregnant within 18 months, and 94.0% were pregnant within 24 months. In other words, only four more women in every hundred had conceived after two years than had conceived within one year.

It may be objected that the prenuptial conceptions should not be included. But since almost half of such conceptions occurred to girls between 15 and 19 years and almost all to girls under 25, it can surely be argued that these have rarely practised coitus consistently and without contraception for more than one year. When questioned, most of these girls said that coitus had occurred only during the two months before the first missed period. The figure of 17.5% of first prenuptial conceptions is reasonably close to that of 16.0% given for the country as a whole by the Registrar-General in 1938-9.

Comparison with Other Surveys

In 1946 Scott Russell, working at Oxford, surveyed 293 women, of whom 197 were primigravidae and 96 multigravidae. In his paper it is not noted whether any of the conceptions were prenuptial, but it is assumed that there is little difference in morals between Salford and Oxford, and that unless questioned directly on this point most women who conceived prenuptially will say that they conceived directly after marriage. It is thought that this may be the reason for the high figure of conceptions noted by Scott Russell to have occurred after marriage but before there had been a menstrual period. He found that of 162 primigravidae, 51 (31.5%) conceived within a month of marriage, 51 (31.5%) conceived within three months, and a further 19.1% had conceived within the first year. Thus 87.7% of 162 primigravidae had conceived within a year of marriage.

Diddle *et al.* (1947), working among families in the U.S. armed Forces at Key West, Florida, surveyed 1,192 women, of whom 799 were pregnant. Of these latter, 261 were primigravidae about whom there were full data, including coital rates. They found that 190 (72.7%) of them conceived within six months and 226 (86.8%) had conceived within one year. By two years 249 (95.4%) had conceived. Bender (1952) found that of 714 primigravidae seen 77.4%

had conceived within one year of first coitus or marriage, and 86.7% within two years. Tietze *et al.* (1950), reviewing the time required for conception in 1,727 pregnancies, found that more than 90% had conceived within one year. These surveys bear out the findings in Salford, and indicate that if pregnancy has not occurred within twelve months of the desire to conceive then the couple should be investigated on the grounds of infertility.

Discussion

A major factor influencing conception in women with normal genital tracts is that coitus between a fertile male and an ovulating female should take place at the time of ovulation (or, it may be, that in some cases it should be able to initiate ovulation). Barton and Wiesner (1946) thought that the ovum is viable only for about 24 hours. Hotchkiss (1945) believed that the spermatozoon is capable of fertilizing the ovum only for 24 to 72 hours after ejaculation into the posterior fornix of the vagina. These two facts mean that a woman is capable of conceiving on only three days of each month, or a maximum of 39 days a year. The important thing is when coitus occurs, not how often.

Davis (1929) investigated the sexual habits of 971 women, and found that, on an average, coitus takes place twice nightly in the first three months of marriage, once nightly in the first year, and twice weekly in the first three years. Thus in the first year of marriage the average woman will have the maximum opportunity of conceiving. After the first years the frequency of coitus is dropping and pregnancy becomes less likely. This may be, in part, the explanation of lowered fertility indices which are said to occur (see above) as a woman grows older.

That psychosomatic factors may influence fertility has long been recognized. Stallworthy (1948) asks, "Is it not probable that a woman may deprive herself of the conception she desires because of the very strength of the desire or the fear of it?" "Hysteria" may produce tubal spasm (Stallworthy), changes in the cervical mucus (Barton and Wiesner, 1945-6), premature maturation of the follicles and discharge of unripe ova (Dunbar, 1946), and possibly anovulation.

Is it not possible, as the months go by and the long-desired conception remains unfulfilled, that this tension mounts and manifests itself in many ways—in general psychological disturbances, in frigidity (and thus in less frequent coitus), and in marital upsets? And from this it is but a short step to the establishment of the vicious circle of "hysteria"—absence of conception—"hysteria."

There is far more to the investigation of a barren marriage than the finding of a "potent male and patent tubes."

Conclusion and Summary

In a survey of 1,202 primigravidae attending Hope Hospital, Salford, between August, 1950, and June, 1951, it was found that 90.25% had conceived within a year of so desiring. Evidence is brought forward which suggests that many cases of infertility are due to as yet inexplicable psychosomatic factors. It is suggested that many of these factors can be corrected by simple investigation and reassurance of the infertile couple. Since only 4% more women conceive between 12 and 24 months after deciding to have a baby than do within the first year, it seems reasonable to investigate infertile couples as soon as one year has passed without pregnancy occurring.

The advantages of this earlier investigation are that (1) the psychosomatic factors involved can be tackled earlier; (2) the sexual drive is greater in the earlier years of marriage; (3) both sexual drive and psychosomatic factors are probably aggravated by non-conception; (4) minor anatomical defects can be remedied earlier; (5) if an absolute bar to conception exists adoption of

have been, used by a group of non-native residents in that country, and what is the past and present incidence of malaria in this group.

The group was composed of all the non-native residents in Nigeria who reported to my out-patient clinic between November 1, 1951, and March 31, 1952.

The following antimalarial drugs were being used at the time these patients were interviewed: proguanil by 68%; quinine by 16%; mepacrine by 6%; chloroquine by 2%. Of the whole group, 6% admitted to being, or were known to be, intermittent in their habits. One individual did not take any antimalarial drug.

Among the adults who had taken only one antimalarial drug daily with regularity since starting to live in Nigeria, a past history of malaria was reported as follows: those taking 100 mg. of proguanil, 15%; 200 mg. of proguanil, 0%; 100 mg. of mepacrine, 17%; 4 or 5 gr. (260 or 320 mg.) of quinine, 50%. Chloroquine in doses of 300 mg. twice or thrice weekly had been taken regularly by three individuals, none of whom reported having had malaria.

The overall incidence of malaria in the group at the time of interview was found to be 11%, of which total 10.9% occurred in those 10 years of age and over and 12.2% in children below this age. Excluding all individuals self-admittedly irregular takers of any antimalarial drug, the incidence of malaria was found to be 9%, and if children are excluded the incidence in adults 20 years of age and over was 8%.

It is concluded that the most satisfactory prophylactic to use at the present time against the subtertian malaria endemic in Nigeria is proguanil, taken in doses of 200 mg. daily by those 10 years of age and over and 50 mg. daily for babies under 1 year. Quinine in doses of 1 to 1½ gr. (65 to 100 mg.) daily is a satisfactory suppressive for infants.

I am indebted to the Inspector-General of Medical Services, Nigeria, for permission to publish this paper.

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The perennial problem of over-population is again stressed in the report for 1951 of the health conditions in the Maltese Islands and of the work of the Medical and Health Department, which was published recently. Cardiac conditions and cerebral vascular accidents accounted for the highest proportion of deaths, the figures being 148 and 102 per 1,000 respectively. Research is being carried out on the radical cure of malignant growths; deaths from this cause increased during the year under review. Progress is reported in the fight against tuberculosis: a good proportion of the population is being radiographed, and the incidence of the disease has shown a considerable decrease. An attempt has been made to integrate the laboratory services in Malta, which are at present divided into several sections and spread over a wide area. All this and much more information is contained in the report, which is available from the office of the Chief Government Medical Officer, Malta.

a child can be made earlier; (6) the investigation of infertile couples extends over many months.

My thanks are due to the medical and nursing staff of the obstetrical and gynaecological department of Hope Hospital, Salford, for their help in the preparation of this paper.

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"COLIFORM DIARRHOEA" IN ADULT HOSPITAL PATIENTS

BY

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This report contains the results of an investigation of adults' faeces for the presence of those type-specific coliform organisms known to be closely associated with diarrhoea and vomiting in infants. The work was undertaken as an extension of two smaller investigations previously reported by Stevenson (1950, 1952), who described the isolation of *Bact. coli* O111.B4 (D433) from adults.

Most of the published work on type-specific strains of *Bact. coli* concerns their presence in the faeces of infants; their occurrence and effects in the adult have not yet been fully studied. Fourteen cases of diarrhoea in adults from whom *Bact. coli* O111.B4 was isolated were reported by Stevenson (1950), and Kirby, Hall, and Coackley (1950) described enteritis in adult volunteers, caused by drinking milk inoculated with an organism of the same type-specific group. Stevenson (1952) investigated specimens of faeces from more than 1,000 adults and found *Bact. coli* O111.B4 in nine, four of whom had diarrhoea. Further evidence that this coliform can produce intestinal upset in the adult was provided by Ferguson and June (1952), who described a large-scale experiment in which adult males developed enteritis following the ingestion of milk artificially infected with the organism.

The six strains of *Bact. coli* from which antisera were prepared and used in the present investigation have been described by Taylor and Charter (1952) and Charter and Taylor (1952). They are designated at present as follows: *Bact. coli* O111.B4, O55.B5, O26.B6, Canioni, E611, and E990.

Methods and Results

The investigation covered the period October, 1951, to October, 1952. At the outset, O and OB antisera were prepared to *Bact. coli* strains O111.B4, O55.B5, and O26.B6; a "pooled" serum was made, and was checked before use. In March, 1952, the strains *Bact. coli* Canioni, E611, and E990 became available; individual and pooled sera were

also prepared from these strains. Thus three type-specific antisera were available for the first six months and six antisera for the second six months of the investigation.

The faecal specimens, most of which were from cases of diarrhoea, were inoculated on to MacConkey, D.C.A., and Difco "SS" agar plates and into a "selenite F" enrichment broth. The subsequent growth on the MacConkey plate was used to detect type-specific coliform strains by slide agglutination; final identification of the organisms was made by tube-testing for the O and B antigens. The other media were employed to detect the *Salmonella* and *Shigella* groups. Each MacConkey plate was examined by testing the inoculation "well" and five separate colonies with the two pooled sera; positive colonies were checked against individual sera and subcultured for tube agglutination tests.

The figures obtained over the twelve-months period are summarized in Table I. *Shigella* and *Salmonella* results

TABLE I.—Results of Examination of 894 Adult Stools

Total	Type-specific Strains of <i>Bact. coli</i> Isolated						<i>Shigella</i> Isolated	<i>Salmonella</i> Isolated
	O111 B4	O55 B5	O26 B6	E611	E990	Canioni		
15	5	2	8	0	0	0	16	4
1.7%	0.6%	0.2%	0.9%	—	—	—	1.8%	0.4%

TABLE II.—Analysis of Cases

Case No.	Age and Sex	Clinical Notes	Organism Isolated	Type of Case
1	F 20	Nurse in children's wards. Sharp attack of diarrhoea	O55.B5 19/10/51	Sporadic
2	F 64	Senile dementia. Sharp attack of diarrhoea. Death	O26.B6 22/11/51	"
3	F 52	Abdominal adhesions. Diarrhoea	O26.B6 1/1/52	"
4	M 51	Early ulcerative colitis	O26.B6 8/1/52	"
5	M 46	Pleural effusion. Diarrhoea	O26.B6 19/5/52	Ward outbreak
6	M 68	Pulmonary tuberculosis. Diarrhoea	O26.B6 20/5/52	
7	M 50	Acute rheumatism. No diarrhoea	O26.B6 20/5/52	
8	M 67	Pulmonary tuberculosis. Diarrhoea	O26.B6 21/5/52	
9	M 79	Gangrene of leg. Amputation. Good recovery. Diarrhoea and vomiting. Death	O111.B4 27/5/52	Sporadic
10	F 59	Glaucoma. Diabetes. Diarrhoea	O111.B4 29/5/52	Ward outbreak
11	F 73	Senility. Diarrhoea	O111.B4 3/6/52	
12	F 84	Senility. No diarrhoea	O111.B4 8/6/52	
13	F 66	Hypertension. No diarrhoea	O111.B4 8/6/52	
14	F 26	Mitral stenosis. Diarrhoea	O26.B6 10/9/52	Sporadic
15	F 22	Diarrhoea and vomiting for 24 hours	O55.B5 27/10/52	"

have been added to the table for comparison, but no member of these two groups was isolated from any of the cases yielding type-specific coliforms. A brief analysis of the cases is shown in Table II.

Description of Cases

Case 1.—An otherwise healthy nurse aged 20 reported sick with diarrhoea on October 18, 1951. Next day *Bact. coli* O55.B5 was isolated. She had been employed in a paediatric ward in which were cases of gastro-enteritis, none of whom was known to be associated with *Bact. coli* O55.B5. Rectal swabs were taken from all the infants in the ward concerned, and *Bact. coli* O55.B5 was isolated from a male infant aged 5 months who was convalescing from gastro-enteritis associated with *Bact. coli* O111.B4, but who at this point had no gastro-intestinal symptoms. The nurse made an uneventful recovery within a few days; the baby remained symptomless.

Case 2.—A woman aged 64 had been an in-patient for one year and suffered from senile dementia. There

was severe progressive debility, and bronchopneumonia developed a few days before her death on November 23, 1951. The day before death the patient began to have profuse diarrhoea, and *Bact. coli* O26.B6 was isolated from the stools. At necropsy, forty-eight hours after death, moderate congestion of the terminal ileum and transverse colon was found in addition to the pneumonia. Swabs taken from organs and tissues did not produce any type-specific coliforms on culture. Rectal swabs taken from every patient in the wards concerned were also negative.

Case 3.—A woman aged 52 was admitted to hospital on December 28, 1951, with a history of intermittent diarrhoea of several years' duration, apparently dating from appendectomy some five years previously: there had been an operation for separation of adhesions three years later. *Bact. coli* O26.B6 was isolated in pure culture on January 1, 1952. No type-specific coliform was isolated from any other patient in the ward. After full investigation the case was labelled "nervous diarrhoea." The patient was discharged on February 2, still having two or three soft stools a day, but negative for type-specific coliforms.

Case 4.—A man aged 51 was admitted to hospital on December 4, 1951, with a history of intermittent diarrhoea accompanied by blood and mucus, for a period of eight weeks. On January 8, 1952, *Bact. coli* O26.B6 was isolated from his stools. All other investigations were negative, though sigmoidoscopy suggested early ulcerative colitis. Further examinations of his faeces were negative, and no type-specific coliforms were isolated from any other patient in the ward.

Cases 5, 6, 7, 8.—There seems to be no reasonable doubt that these four cases constitute an outbreak. On May 18, 1952, a specimen of fluid faeces consisting of almost pure blood was received from a patient (Case 5) in a male ward; he had been admitted on May 14 suffering from a pleural effusion. The MacConkey plate showed an almost pure growth of *Bact. coli* O26.B6 on May 19, and rectal swabs were taken immediately from each of the 32 patients in the ward. The following morning two more patients (Cases 6 and 7) were found to have *Bact. coli* O26.B6 in their stools. When the ward staff was notified of these two new cases, information was received that both patients were convalescent and neither had diarrhoea. Case 6, however, developed severe diarrhoea six hours later, with blood and mucus in the stools. No diarrhoea was reported in Case 7. The same day (May 20) another patient (Case 8) developed severe diarrhoea, and twenty-four hours later the MacConkey plate from this patient was found to have a pure growth of *Bact. coli* O26.B6. No other positives were found in this ward, and within 72 hours all diarrhoea had ceased and the four positive cases were negative for the specific coliform.

Case 9.—A man aged 79 was admitted to hospital on February 10, 1952, suffering from gangrene of the left leg. Mid-thigh amputation was performed on April 22. His condition was satisfactory until May 24, when he had slight diarrhoea. This was followed by violent vomiting and diarrhoea twenty-four hours later. On May 27 *Bact. coli* O111.B4 was isolated in pure culture from the faeces. The patient died the following day; permission for necropsy was refused. One point worthy of comment is that a simultaneous case of diarrhoea associated with *Bact. coli* O111.B4 occurred in a child of 9 years in a ward immediately below that where Case 9 was a patient. Rectal swabs from other patients in both wards were negative for type-specific coliforms.

Cases 10, 11, 12, and 13.—This group constitutes another ward outbreak, though less definite than that involving Cases 5, 6, 7, and 8. Case 10, a woman aged 59, was admitted to hospital on May 15, 1952, suffering from glaucoma and diabetes. Diarrhoea developed on May 28 and *Bact. coli* O111.B4 was isolated in pure culture from her stools the following day. Two days later a specimen of faeces was received from another patient in the same ward (Case 11); this patient had had bouts of diarrhoea with blood and mucus on four occasions during the previous

three weeks. *Bact. coli* O111.B4 was isolated from this specimen on June 3 and from subsequent specimens on June 4, 8, and 24, after which date the diarrhoea ceased and the stools became negative. On June 7 rectal swabs were taken from every patient (a total of 32) in the ward concerned, and *Bact. coli* O111.B4 was isolated from two further cases (Nos. 12 and 13). Neither of these patients had diarrhoea, though Case 12 gave a history of having had intermittent diarrhoea some four months previously, when no salmonella, shigella, or type-specific coliforms had been found. The diarrhoea in Case 10 ceased within 72 hours and the stools were thereafter negative.

Case 14.—This woman, aged 26, was admitted to hospital in March, 1952, suffering from mitral stenosis with severe decompensation. On September 6 she began to have loose stools amounting to five or six motions a day, and on September 10 *Bact. coli* O26.B6 was isolated. No blood or mucus was noted in the stools, and no type-specific coliforms were present in specimens of faeces three, four, and five days after the first isolation, the diarrhoea having ceased by this time. No other cases of diarrhoea occurred and no type-specific coliform was isolated from any other patient in the ward concerned.

Case 15.—This patient was a woman aged 22 who was sent to hospital by her family doctor on October 26, 1952, with a diagnosis of acute appendicitis. She had pain in the right iliac fossa, vomiting, and some diarrhoea of 24 hours' duration. On admission it was thought she had bacillary dysentery, so she was isolated and barrier-nursed. The day after admission, *Bact. coli* O55.B5 was isolated in pure culture from a faeces specimen. The patient made an uneventful recovery and was well within a few days, no type-specific coliforms being found after the first isolation. An interesting feature of this case is that her 5-months-old child was in another hospital suffering from gastro-enteritis: no type-specific coliform is known to have been isolated from the child.

Discussion

Among adult hospital patients, small localized outbreaks of diarrhoea of unknown cause, affecting perhaps as many as one-third of the inmates of a ward, are a common experience, as are also sporadic isolated cases which occur from time to time. Frequently the diarrhoea is ascribed to dietary factors of uncertain origin, but from the results of the present investigation we believe that some of these cases are what may be called "coliform diarrhoea"—that is, diarrhoea caused by type-specific strains of *Bact. coli*. There does not at present appear to be any other explanation for the results obtained; the figures suggest that *Bact. coli* O111.B4, O55.B5, and O26.B6 can be the causal agents in a small proportion of cases of adult enteritis. The ward outbreaks affecting the two groups of cases (Nos. 5, 6, 7, and 8, and 10, 11, 12, and 13) provide good evidence for this belief. Here, small groups of patients developed diarrhoea directly related in time of occurrence to the presence of specific coliform organisms isolated in pure culture from the stools. Further evidence is provided by the sporadic cases, especially the two fatal ones (Nos. 2 and 9). These two patients were elderly and were weakened by previous illness; they developed sudden severe diarrhoea, coincident with which *Bact. coli* O26.B6 and O111.B4 respectively were isolated from their stools, and the resulting dehydration and exhaustion were enough to cause death.

It has been suggested in a previous communication (Stevenson, 1950) that these coliform organisms might appear in the stools as the result of the washing-down effect of diarrhoea. That this is untrue is shown by the many hundreds of adult enteritis cases investigated in this series from which no type-specific coliforms were isolated. Smith, quoted by Taylor and Charter (1952), has had similar negative findings in bacillary dysentery of infants. In only two of our positive cases (Nos. 3 and 4), both of whom had prolonged diarrhoea, has a type-specific coliform appeared in the stools as a transitory phenomenon unrelated to any marked exacerbation of intestinal symptoms. Moreover,

three cases (Nos. 7, 12, and 13) excreted type-specific coliforms when no diarrhoea was present, and in Case 6 *Bact. coli* O26.B6 was isolated and identified immediately before any looseness of stools began.

Certain conditions seem to be necessary before type-specific coliforms can exert a pathogenic effect in the intestine. From the cases described, debility and general weakness are evidently important predisposing conditions, but there is evidence of another, unknown, factor. In Cases 1 and 15 there was no history of previous illness, and both patients were young and in relatively good health; nevertheless they developed severe diarrhoea, and type-specific coliforms were isolated in pure culture from each. This other factor may be related to the virulence of the strain concerned. That Cases 1 and 15 developed symptoms could be explained by the particular organisms being highly virulent. As both these patients had enteritis on admission to hospital, they were barrier-nursed, and thus it was not possible to assess the virulence of the organism by observation of a subsequent case-to-case spread. In general, however, the pathogenicity to adults of the type-specific coliforms seems to be of a low order. Thus Cases 7, 12, and 13, despite age and debility, were able to harbour certain of these organisms without developing diarrhoea: the transitory appearance of the organisms in these three patients suggests that there is no true carrier state.

Over the period of the investigation coliform diarrhoea had the same incidence as bacillary dysentery. This, plus the fact that several of the cases in the coliform series had blood and mucus in their stools, suggests that coliform diarrhoea in adult hospital patients may present itself in a manner similar to the shigella infections. There is, however, one main difference between the two types of diarrhoea: dysentery organisms tend to remain in the intestinal tract over a relatively long period, whereas infection with a type-specific coliform is usually transient. In most of the cases in the present series, particular coliforms could be identified only for about 48 hours, after which the stools became negative.

Only two patients in the series had any contact with young children (Cases 1 and 15), and in neither instance was there any definite link of infection so far as can be ascertained. Case 9 had a remotely possible contact with the infected child in a neighbouring ward, but here again the chain of infection is obscure. Contact with infants therefore does not seem to play an important part in the infection of adults with the type-specific coliforms.

Summary

During the examination of 894 faecal specimens from adult hospital patients, type-specific strains of *Bact. coli* were isolated from 15 cases. These strains belonged to O groups 111, 26, and 55; none of the E611, E990, or Canioni strains was found. Twelve of the positive cases had diarrhoea of varying severity; two of these patients died, the associated organisms being *Bact. coli* O26.B6 and O111.B4.

It is suggested that diarrhoea in adult hospital patients can be caused by type-specific strains of *Bact. coli* and that it constitutes a definite syndrome for which the term "coliform diarrhoea" may be used; the predisposing factors are discussed.

We wish to thank Dr. Joan Taylor for supplying cultures of the type-specific strains from which antisera were prepared, and also for confirming the 15 strains isolated during the investigation. Our thanks are also due to Dr. A. D. Briggs, medical superintendent, Stobhill General Hospital, for permission to make use of clinical notes.

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INFECTED URACHAL CYSTS

BY

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The first undisputed report of cyst formation in the urachal relic was contributed by Lawson Tait in 1883. It was, however, the researches of R. C. Begg (1927, 1930) which established the nature of development and anomalies of the urachus on a firm basis. The following facts emerged. The urachus and bladder develop exclusively from the ventral cloaca. The urachus arises by a narrowing of the cranial end of the cloaca and shares with the bladder in its post-natal descent from the umbilicus. In its descent the urachus drags down the adventitia of the obliterated umbilical arteries and, at the same time, its apex becomes broken up, leaving behind its epithelial cells. These epithelial cells may proliferate to form adenomata or, by central degeneration, give rise to cyst formation.

Although containing pus and debris, many cysts are sterile, others grow *Bact. coli*, streptococci, or staphylococci. The route of infection is probably haematogenous in most cases.

Incidence.—In reviews of the literature, Weiser (1906) collected 89 cases and Kantor (1939) a further 38. Since 1936 32 references to the condition have been found in the literature. Yoerg (1942) found only 3 cases in 12,500 admissions to the Brady Urological Institute. The recorded literature gives the impression that anomalies of the urachus are rare, but few experienced surgeons fail to claim one or two cases, and my own experience of four and possibly five cases in a short period strengthens the belief that they are not uncommon. Sex incidence is difficult to establish, but Kantor's analysis suggests an approximately equal incidence. Age incidence in his series varies from 20 months to 69 years.

Classification (Long, 1931).—(1) Those communicating with the bladder. (2) Those communicating with the umbilicus. (3) Those communicating with the bladder and umbilicus. (4) Those communicating with neither. Group 4 cases are most common, and it is easy to understand how these may become group 1 or group 2 as a result of infection.

Diagnosis and Treatment

It is probable that the majority of group 4 cases never come to light unless they become infected; they may give no symptoms and are discovered only at necropsy. The presence of a urachal cyst should always be suspected in any midline abdominal-wall swelling lying between the umbilicus and the symphysis pubis. Differentiation from vitelline cysts is facilitated when it is remembered that the latter are not continued downwards as a sinus towards the symphysis pubis (Yoerg, 1942). Cystoscopy helps in group 1 and group 3 cases, and a patch of bullous oedema in the apex of the bladder may lead to the suspicion of an infected cyst.

The ideal treatment is complete excision of the cyst and tract extraperitoneally. When infected, incision with drainage is often safer. In many cases this is curative, and in any event does not make complete excision at a later date much more difficult. Infection of the peritoneal cavity can generally be well controlled with chemotherapy, and, though undesirable, spillage does not lead to the serious peritonitis of former days. Opening the peritoneum need not be feared if that is necessary for the complete removal of the cyst and its tract.

Case 1

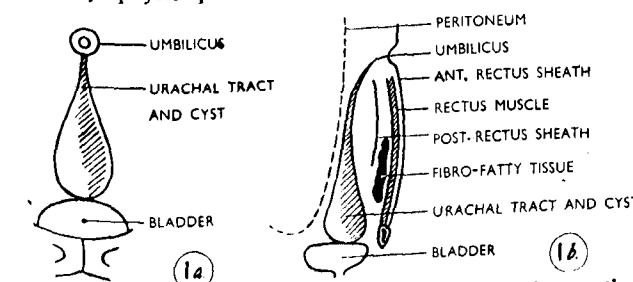
A roadman aged 46 was admitted to hospital complaining of difficulty in passing urine for three days, and of complete retention on the day of admission.

On examination his temperature was 99° F. (37.2° C.); his abdomen revealed an old puckered appendicectomy scar with surrounding fibrosis, and the scar of a right inguinal hernia repair. The bladder was distended half-way to the umbilicus. After unsuccessful catheterization he passed 14 oz. (400 ml.) of urine and continued to do so, although at first with some difficulty.

Investigations.—Urine: deposit of red blood cells, polymorphs, and Gram-negative bacilli. Blood urea, 40 mg. per 100 ml. Straight x-ray film and intravenous pyelogram normal. Cystoscopy showed general congestion of mucous membrane only. A diagnosis of acute cystitis was made, and after a course of penicillin the patient was discharged free from urinary symptoms.

Two months later he was readmitted because of sub-umbilical pain before, during, and after micturition. He was now tender below the umbilicus, and a plaque of induration was noted between the symphysis and the umbilicus but no swelling or inflammation. He had a mild fever and his urine contained mucoid material and a few red blood cells. Cystoscopy revealed a very prominent anterior commissure to the prostate and a small rosette of bullous oedema in the dome of the bladder. These findings were interpreted as being probably due to a urachal diverticulum. A cystogram showed an ill-defined extension from the fundus of the bladder.

Operation (See Figs. 1a and 1b).—Under penicillin cover a midline incision was made from the umbilicus to the symphysis pubis. This was deepened through the



Figs. 1a and 1b.—Diagrammatic representation of operation findings in Case 1.

rectus sheath to expose a glistening mass of fibro-fatty tissue. The bladder was opened and a mass the size of a billiard ball was palpable in the dome, but no diverticulum could be made out. In an attempt to dissect out this mass it ruptured, with the escape of cheesy material and pus. Running up from the cavity thus exposed was a track lying extraperitoneally and extending almost to the umbilicus, the surrounding tissues being almost cartilaginous in consistency. As much as possible of the anterior wall of the track and cyst was excised. The interior was then curetted and finally treated with the diathermy button to destroy any epithelial elements. The bladder was closed about a Pezzer catheter and the cyst and its track were packed with paraffin and flavine gauze. The wound was left widely open.

Pathology.—Sections of the walls of the cyst and track consisted of fibro-muscular tissue with inflammatory cell infiltration and exudate. Smears of pus showed fibrinous debris with epithelial cells and a few polymorphs. There were no organisms and no growth after 48 hours' incubation.

The wound slowly granulated to the surface; the de Pezzer tube was then removed and complete epithelization followed, leaving a very firm abdominal wall. Cystoscopy before discharge showed a completely normal bladder, and five months later he had no urinary symptoms and the abdominal scar was firm.

Case 2

A bricklayer aged 31 was admitted to hospital, having had soreness and swelling at the umbilicus for two weeks, followed by some vague abdominal pains. For the last four days the abdominal pain had become more severe. Meanwhile the swelling at the umbilicus had become larger, tender, and red. For three days he had not had his bowels open or passed flatus. He felt sick, but had not vomited. He had not previously noticed a swelling at the umbilicus, although it had never been a depressed scar. There had never been any discharge from the umbilicus or any urinary symptoms.

On examination his temperature was 100.6° F. (38.1° C.), pulse 80, and respirations 20. Protruding from the umbilicus was a red glistening swelling, about 2.5 cm. in diameter, which was very tender on palpation. At first sight this looked like a knuckle of bowel protruding through the umbilical cicatrix, but more careful examination showed it to be covered with skin, continuous around the margin of the umbilicus with the skin of the anterior abdominal wall. There were tenderness and guarding in both iliac fossae and in the umbilical region. Bowel sounds were accentuated. A provisional diagnosis of inflamed umbilical hernia with strangulated contents was made.

Operation.—The swelling was explored through a transverse elliptical incision and an infected urachal cyst was found. To its peritoneal surface the omentum was firmly adherent, and when this was separated the thin wall of the cyst ruptured, with discharge of pus and necrotic material. The whole cyst and the urachal cord were dissected out along with the umbilical arteries and their peritoneal coverings. The abdominal wall was repaired with stainless steel wire.

Apart from minor wound sepsis he made an uneventful recovery. The wound healed completely, leaving a firm abdominal wall.

Case 3

A carpenter aged 28 was admitted to hospital. Seven days previously he had noticed a stiffness in the region of the umbilicus after lifting some heavy weights. This persisted, and for four days there had been a yellowish discharge from the umbilicus. On the day of admission he developed a pain around the umbilicus, which became worse and at the time of examination was constant and severe. He had no alimentary or urinary symptoms.

On examination his temperature was 99.4° F. (37.4° C.), pulse 100, and respirations 20. In the umbilicus was a small red nodule from which yellow pus exuded on pressure around. There was generalized abdominal tenderness. The bowel sounds were normal and cystoscopy was negative. A provisional diagnosis of infected urachal cyst was made.

Operation.—Under penicillin cover, an elliptical incision was made around the umbilicus, and on deepening it through the rectus sheath a small urachal cyst was found in the extraperitoneal tissue below the umbilicus. A well-marked urachal cord continued down from this. The cyst, cord, and obliterated hypogastric vessels, as well as a portion of the ligamentum teres, with the peritoneum covering their posterior surface, were then excised. The wound was closed in layers, using stainless-steel wire for the rectus sheath. The subcutaneous tissues were drained with corrugated rubber. He made an uneventful recovery.

Pathology.—Microscopically no epithelial lining to the cyst was present and no lumen was visible in a transverse section of the distal end of the urachus. There were many pus cells and mixed organisms in the pus, but no growth on culture.

Case 4

A storeman aged 33 was admitted to hospital, having had a discharge from the navel for three weeks. His doctor had given him penicillin cream to apply. Three days before admission he began to have pain below the umbilicus which

was griping and spasmodic but not very severe. There was no nausea or vomiting, and no alimentary or urinary symptoms.

On examination a purulent discharge was seen coming from the umbilicus, and just below it there was a small spheroidal swelling in the abdominal wall. Cystoscopy and cystography were normal.

Operation.—A midline incision with an ellipse was made around the umbilicus. A urachal cyst was defined and dissected free. The urachal cyst was followed down to the dome of the bladder, where it was clamped and divided. The bladder wall was repaired in two layers with catgut. The obliterated hypogastric arteries were also dissected out, the whole procedure being performed extraperitoneally. The linea alba was repaired with wire and the skin closed about a corrugated drain.

Pathology.—Microscopically there was no epithelial lining to the cyst, and no lumen was present in a transverse section of the distal end of the urachus. The appearances were those of an infected urachal cyst.

Comment

Cases 1 and 2 fall into Long's group 4, and Cases 3 and 4 into group 2. They show several interesting points in the ways they presented, in diagnosis, and in treatment. Case 1 presented first as acute retention of urine, and there was difficulty in deciding how this arose. A possible explanation is that inflammation in the urachal relic caused a block in the lymphatic territory, which it presumably shares with the bladder-neck, since both derive from a common ancestor—namely, the ventral cloaca. This would cause oedema around the neck of the bladder, and a "congestive stricture" would result. Some support is given to this theory by the finding, on cystoscopy, of "a prominent anterior commissure" to the prostate which was probably due to oedema, since it had completely disappeared at the final examination. The ring of bullous oedema in the dome of the bladder which gave the first clue to the diagnosis was very striking indeed. Case 2 presented as an inflamed umbilical hernia with strangulation, and only at operation did the true nature of the condition become apparent. Cases 3 and 4 complained of a discharge from the umbilicus with an associated midline swelling, and a pre-operative diagnosis was made with confidence.

Case 1 was treated by saucerization of the cyst and track combined with diathermy cauterization of the epithelial lining. In Cases 2 and 3 the umbilicus and the urachal cyst and track were excised with their covering peritoneum; while in Case 4 the cyst and track were dissected out without opening the peritoneum. The final result was similar in each case.

In the last year one other case has been seen, which, although not capable of complete proof, is highly suggestive of urachal pathology.

A housewife aged 64 complained of a painful swelling in the lower abdomen of one week's duration. She had recently had an attack of influenza and bronchitis, but no symptoms referable to her genito-urinary or alimentary tracts. On examination there was a large rounded swelling in the anterior abdominal wall, extending up from the symphysis pubis, half-way to the navel. There was central fluctuation beneath red and oedematous skin, and obviously pus lay underneath. The mass was incised and a large quantity of foul-smelling pus escaped from a subcutaneous abscess. The latter led through a hole in the linea alba to another abscess cavity lying behind the recti muscles but in front of the peritoneum, which was intact. The abscess was saucerized and drained through two lateral stab drains with suture of the midline incision about a central drain. She made an uneventful recovery, and when seen eight months later the lower abdomen was quite healed and soft. Pathological examination of the pus showed numerous pus cells but no organisms. There was no growth on culture.

The midline situation of the abscess, its "collar-stud" nature, and the fact that the communication between its two compartments was so strictly midline suggested an

infected urachal cyst as a possible diagnosis. Of course, the alternative diagnosis of an infected haematoma brought on by her recent coughing is equally admissible.

These cases seen in a short period seem to indicate that the urachal remnant is a more frequent cause of disease in the umbilicus and anterior abdominal wall than is perhaps generally realized.

Summary

The development of the urachus and the pathogenesis of urachal cysts are discussed.

A note is added on their incidence, diagnosis, and treatment.

Four cases of infected urachal cysts and possibly a fifth case are described and the clinical and operative findings commented upon.

I should like to express my gratitude to Mr. D. P. Marks, of Stratford-upon-Avon Hospital, and Mr. Henry Clarke, of Luton and Dunstable Hospital, for permission to publish these cases and for assistance with their management; to Mr. L. R. Broster for encouragement and criticism in writing this paper; to Dr. J. Bradley Watson for the pathological reports; and to the librarian of the B.M.A. Library for considerable help with references.

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LINGUAL THYROID

BY

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Lingual thyroid is a rare occurrence. It appears that Hickman recorded the first case in 1869. Buckman (1936) collected 242 cases from the literature up to and including 1935, but Montgomery (1935, 1936), studying probably the same material, reduced this number to 144 which he accepted as genuine lingual thyroids. Crispell and Parson (1950) stated that up to 1949 a total of 276 cases had been reported. Between 1949 and 1951 I was able to find seven more reports of lingual thyroid, including the case described below. In all these cases the lingual thyroid was causing symptoms; the incidence of silent cases will never be established.

Montgomery recognized as authentic lingual thyroids only those cases in which a specimen was examined and proved histologically to consist of thyroid gland tissue and when the lesion was situated in the tongue substance between the epiglottis and the circumvallate papillae. From the embryological point of view, it is natural to expect that the most common site for its occurrence in the tongue should be in the region of the foramen caecum.

According to Montgomery (1935, 1936), Goetsch (1948), and Nordland and Nordland (1950) "lingua thyroid" and "lingual goitre" should not be confused with "aberrant thyroids," as they accept the view of Warren and Feldman (1949) that the latter are metastatic deposits from carcinoma of the thyroid gland.

A great majority of reported lingual thyroids were histologically diagnosed to be benign. A definite malignancy in lingual thyroids was reported in few

instances (Graham and McWhirter, 1947). Most cases resembled the normal thyroid tissue, but adenomatous changes have been observed in some. In most of them, normal type of epithelium predominated, and in others the foetal type was present. Simple goitre of colloid type has also been seen.

Lingual thyroids or goitres are detected usually when their size is such that they give rise to symptoms. It has been postulated that thyroid insufficiency is responsible for most, if not all, simple hypertrophies of lingual thyroid tissue. No case has been reported with hyperthyroidism. The thyroid insufficiency may arise when a special stress such as puberty, pregnancy, or lactation exists, and in the total absence of the thyroid in the normal anatomical position these factors excite a compensatory hypertrophy of the ectopic thyroid tissue. This view is well supported by the histories of the recorded cases. The menopause was also described as a possible factor. Most of the patients were females.

The interesting feature in the following case is the unusual presenting symptom of haematemesis, which was misleading enough to cause considerable delay in establishing the diagnosis. The rarity of this condition precludes learning from one's own experience. The main object of this paper is to draw attention to its existence and to give guidance in management of a similar case.

Case Report

A married woman aged 30 was admitted as an emergency case in December, 1950, because of haematemesis, but giving no previous history of vomiting or dyspepsia. She was of small stature, 4 ft. 8 in. (142 cm.), fairly well nourished, and of limited intelligence. She had two children, both delivered by caesarean section. She was now six months pregnant. There had been amenorrhoea for the past seven years. Abdominal examination revealed no epigastric tenderness. Her pulse was rapid, of poor volume; heart sounds were good; blood pressure was 120/70. Her blood count was: Hb, 50%; colour index, 0.7; red cells, 3,500,000; white cells, 20,000 (polymorphs 85%, lymphocytes 10%, large monocytes 4%, eosinophils 1%). Three pints (1.7 ml.) of blood was transfused, following which her blood count was brought to normal limits. She remained under observation for about a fortnight, and as there were no further symptoms she was discharged and advised to attend the antenatal clinic. She was delivered of a stillborn baby by caesarean section on March 15, 1951.

She was well until June, 1951, when she was again admitted as an emergency because of another haemorrhage. This time, however, she said that she "felt fluid at the back of her throat" which she kept swallowing. She vomited about $\frac{1}{2}$ to $\frac{1}{4}$ pint (140 to 280 ml.) of blood in the ambulance. At the same time she noticed that her voice became "thick." Examination of the mouth with the help of a laryngeal mirror revealed a pale-pink, globular, and firm mass, approximately 2.5 cm. in diameter, which was attached to the tongue in the region of the foramen caecum. The mucous membrane running over it was intact, and there were numerous dilated veins which were probably responsible for the haemorrhage. The suprasternal space appeared to be much emptier than usual, and the trachea was easily palpable. Thyroid could not be felt in the neck. A lateral x-ray film of this region confirmed the existence of a well-defined swelling at the far end of the tongue. The opinion was expressed that the mass was most probably a lingual thyroid.

Her family history revealed that both parents are rather small, approximately the same height as she is. She has three sisters and one brother. One sister and the brother are of normal height, but two other sisters are not much taller than she. Her two boys are of right size and weight

for their age. She knew that she was thyroid-deficient, as her family doctor had been giving her thyroid tablets from 2 years of age. Her voice became thicker after the first haemorrhage (December, 1950), when she was six months pregnant, and during the last month or two of pregnancy she began to have difficulty in swallowing.

Because of the risk of a haemorrhage, a diagnostic test with radioactive iodine was advised instead of biopsy. A tracer dose of 100 μ c. of I^{131} was given orally, and the measurements were started six hours later with a Geiger counter. These demonstrated that the iodine was taken up by the mass in the posterior third of the tongue, and that there was no evidence of any uptake in the neck. The 48-hours urinary excretion of I^{131} was about 60%. The B.M.R. was +1%. The diagnosis of a lingual thyroid was therefore confirmed. In view of the history of thyroid deficiency, treatment with Lugol's iodine was begun. After six weeks of this treatment the swelling showed no change in size. As it was thought that surgical removal would involve a great risk, especially of haemorrhage, it was decided to treat her with radioactive iodine. Because of her age, only 5 mc. of I^{131} was administered in September, but as there was no change in size of the thyroid after three months a further dose of 20 mc. was given in January, 1952. Its urinary excretion increased to 78% in the first 48 hours. The B.M.R. taken at the same time was -19%. Even after this dose the swelling did not appear to shrink, but in fact it looked larger. She began to complain of more difficulty in swallowing, dysphonia was more pronounced, and she had two more small haemorrhages. Her weight increased slightly and her face was somewhat puffy. At the end of March her B.M.R. was -24%. It was then decided that the thyroid had to be removed surgically. Operation was carried out on May 12; the tongue was pulled well out, and, with a finger supporting the tumour from behind, access was surprisingly good. An incision was made over the anterior part of the swelling, which was then shelled out without any difficulty. Haemorrhage was easily controlled by interrupted sutures.

The post-operative course was uneventful, and she was discharged after nine days. The pathological report was as follows: "The specimen is well encapsulated, roughly spherical in outline, and about 4 cm. in diameter. The cut surface suggests thyroid tissue. Section confirms that it consists of thyroid tissue which shows marked variation in structure from active epithelial hyperplasia to involution and quiescence. There is no evidence of malignancy."

On August 12 her swallowing was good and her voice was normal. Myxoedematous signs and symptoms became, however, much stronger. The B.M.R. dropped to -38%, and she was given thyroid extract. Since then she has remained well and symptom-free.

Diagnosis

According to Goetsch, lingual thyroid has to be differentiated from adenoma, angioma, salivary tumour, fibroma, non-thyroid cysts, and the rare instances of malignancy such as sarcoma, lymphosarcoma, and carcinoma. Apart from the characteristics associated with thyroid insufficiency, which are frequent, most symptoms are caused by the pressure and obstruction of the lingual swelling. Various degrees of dysphagia, dysphonia, and dyspnoea are the most common symptoms. Occasionally, tightness in the throat or a choking sensation is the only complaint. Recurrent haemorrhage from the mouth was one of the symptoms recorded.

It is important to remember that in examination of the mouth extreme protrusion of the tongue is essential, as a small nodule can easily be overlooked. Inspection with a laryngeal mirror should not be omitted. Lateral x-ray films of the soft tissue of the face and neck will help in locating the lesion.

Nachman *et al.* (1949), and Crispell and Parson (1950), diagnosed their cases with a tracer dose of I^{131} and physical

measurements with a Geiger-Müller counter. In my case this test was found to be most helpful, and it is strongly recommended because of its accuracy, simplicity, and absence of risk. Biopsy, the obvious procedure in diagnosis of most tumours, seems to be superfluous. It is worth noting that the results of the tracer dose corresponded with those of the B.M.R. in this case.

Treatment

Lingual thyroid has never been successfully treated medically. Montgomery tried Lugol's solution without success. In some goitres thyroid extract could perhaps be of some benefit, but it is doubtful whether it would adequately reduce the symptoms caused by obstruction, nor would it eliminate a recurrence of a haemorrhage. The only other methods available are radiotherapy and surgery. It seems hardly justifiable to treat a simple goitre with high dosage of deep x rays, which would result in severe skin and mucosal reactions. Small dosage would be of little if any effect.

Treatment with radioactive iodine, mainly because of its simplicity and its effectiveness in other thyroid conditions, would seem to be an obvious method to explore. Hamilton and Lawrence (1942) have demonstrated that the administration of I^{131} to rabbits was followed by a decrease in size of the normal thyroid. Since then this isotope has been successfully used in the treatment of toxic goitres in various centres. Buck and Guthrie (1949), and Schilling *et al.* (1950) have reported cases of lingual goitres treated with I^{131} , but, although decrease in size was claimed, in neither case was the resolution of the swelling complete, and some of the symptoms persisted. Myxoedema was produced in each case. A study of the concentration of I^{131} in thyroid by radioautography revealed that the absorption of iodine depended greatly on the type of predominant tissue, and it was seldom homogeneous. It was said that thyroids with abundant colloid are more likely to concentrate the isotope. In my case no beneficial effect whatsoever was observed. Once the lingual thyroid reaches the dimensions when the patient starts to have more than occasional discomfort, and especially when a haemorrhage occurs, one is forced to remove the tumour and disregard the thyroid function in order to eliminate the symptoms.

Furthermore, it is generally accepted at present that no radioactive substance should be given in therapeutic doses to young patients. As the result of treatment with this isotope is doubtful it seems ill-advised to break this rule in the case of a lingual thyroid, which occurs mostly in children or young adults, unless there are strong contra-indications to surgery.

It was stated by some authors that surgery is technically difficult and because of anaesthetic hazards and the difficulty in controlling the bleeding it should be replaced by therapy with radioactive iodine. My experience in this single case was to the contrary. In fact, the extirpation of this goitre was characterized by absolute simplicity in every respect. Others who have also chosen the oral route in recent years found no apparent difficulties, and one wonders if modern anaesthesia and surgery would not remove the above-mentioned objections. The extraoral route was adopted by some in unusually large tumours. The most commonly expected sequel is thyroid insufficiency, which, however, can be easily controlled by giving small doses of thyroid extract. This complication might be avoided in cases of thyroids which are not encapsulated, and it seems reasonable to follow the advice given by Goetsch, that complete removal or destruction need not be attempted.

Summary

A case of lingual thyroid is reported in detail, and a short survey of the literature regarding this rare condition is made with reference to its incidence and pathogenesis. Its diagnosis and treatment are more fully

discussed, and evaluation of radioactive iodine as a diagnostic and therapeutic agent is attempted. On the basis of recorded cases in the literature and from my own experience it is concluded that I^{131} serves as the most valuable test towards the diagnosis, but in treatment the surgical approach is found to be preferable.

I wish to thank Mr. T. H. Berrill, who performed the operation, for his helpful co-operation and Dr. W. C. MacCullagh Wilson for his pathological investigations.

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Medical Memorandum

"L.E." Cells in Acute Disseminated Lupus Erythematosus Treated with A.C.T.H.

Many cases of acute disseminated lupus have now been treated with A.C.T.H. or cortisone (Montgomery and McCright, 1949; Brunsting *et al.*, 1951; Haserick *et al.*, 1951). However, the initial detection of L.E. cells in this disease after treatment with A.C.T.H. or cortisone has rarely been recorded (Haserick, 1951; Michael *et al.*, 1951). The following case showed this phenomenon.

CASE REPORT

A single woman aged 23 was admitted to hospital on August 21, 1951, with a two-months history of a rash around the eyes, cheeks, nose, and "V" of the neck. She had taken four tablets containing phenolphthalein a few days before the rash appeared. Five weeks later she complained of malaise, nausea, shivering, pains in the limbs, and swelling of the face. The following week the rash had spread to involve the hands and feet. Her past history was uneventful, apart from an attack of "influenza" which was treated with sulphonamides at the age of 17 years. She denied being given sulphonamides on any other occasion, and gave no history of sensitivity to sunlight.

On examination she appeared seriously ill. Her temperature was 103° F. (39.4° C.), pulse 120, respirations 20, and blood pressure 110/60. A violaceous erythema extended over her face, ears, scalp, and "V" of the neck, and scaling and crusting were present on her cheeks. The swelling on her face was such that her eyes could be opened only with difficulty. The pulps of the fingers and toes showed erythematous patches, and telangiectases were present around the nail-folds. The mucous membranes of the mouth and lips were superficially eroded. Moderate painless enlargement of the axillary, cervical, and epitrochlear glands was present, and the spleen was just palpable on inspiration. No abnormality was detected in the chest or locomotor or nervous system.

Investigations.—Hb, 12.58 g. per 100 ml.; red cells, 4,200,000; white cells, 4,000, with a lymphopenia and toxic granulocytic changes; platelets, 90,000 per c.mm. (Lempert). The iliac marrow smears showed changes consistent with a severe toxic process. Plasma proteins, 7.19 g. per 100 ml.

(albumin 3.3 g., globulin 3.8 g.). Urine, normal. Blood urea, 83 mg. per 100 ml. Urinary creatinine, 1.41 g./24 hours; plus creatine, 1.54 g. Blood culture, negative. Paul-Bunnell reaction, negative. No L.E. cells found, using the technique of Eppes and Ludovic (1951).

A diagnosis of acute disseminated lupus erythematosus was made. Over the next few days the patient's clinical condition deteriorated, and she became very drowsy.

Starting on August 28, 50 mg. of A.C.T.H. daily was given by intravenous drip in 5% dextrose solution for four days, followed by 40 mg. daily for a further four days. Within 12 hours the temperature had fallen to normal, and there was subjective improvement. On August 29 numerous L.E. cells were found in the peripheral blood for the first time.

A.C.T.H. was discontinued on September 4 because signs of pneumonia developed at the right lower lobe. By this time all the skin manifestations had disappeared. Chloramphenicol, aureomycin, and penicillin were given without any exacerbation of the lupus erythematosus, and she was discharged home on October 13 still complaining of general weakness, but afebrile and with no abnormal physical signs. Coincident with the clinical improvement the number of L.E. cells in the peripheral blood decreased, and two days before discharge could no longer be demonstrated. The A/G ratio had also reverted to normal.

During the next three months she felt very well and was symptom-free. Her weight steadily increased, and there was no clinical evidence of lupus erythematosus.

Investigations on January 31, 1952, showed: Hb, 13.32 g. per 100 ml.; red cells, 4,800,000; white cells, 6,000, with normal differential count. E.S.R. (Wintrobe) had fallen from 38 mm. in one hour on October 25 to 28 mm. on January 31. Plasma proteins, 6.9 g. per 100 ml. (albumin 4.5 g., globulin 2.4 g.). Urine, normal.

At this time, however, L.E. cells were again found in the peripheral blood, and one week later the rash recurred on the face. On February 16 she was readmitted to hospital and given 50 mg. of A.C.T.H. intramuscularly daily for 10 days, followed by 100 mg. daily for two days. Then for 200 mg. of cortisone was given intramuscularly daily for three days, but, except for a transient initial response, her condition steadily deteriorated and she died on March 3. During this relapse L.E. cells were repeatedly found in the peripheral blood, there was a steady fall in the haemoglobin, erythrocytes, leucocytes, and platelets, the E.S.R. increased, the urine contained albumin, casts, and red cells, and the blood urea rose. The A/G ratio again became inverted, although the total protein values remained within normal limits.

DISCUSSION

This case initially showed a dramatic response to A.C.T.H., but the response during a relapse was almost negligible. The reason for this acquired resistance is not clear.

Hargraves *et al.* (1948) first reported the finding of L.E. cells in heparinized bone marrow. They are usually polymorphonuclear leucocytes containing a rounded body, which is most often homogeneous, but may at times show a reticular or granular pattern. The presence of the inclusion body causes the lobes of the polymorph nucleus to be flattened out at the periphery of the cell. Occasionally similar bodies may be found in eosinophils or histiocytes. The inclusion bodies are derived from either polymorph or lymphocytic nuclei, and have been shown to contain desoxy-ribose nucleic acid. The production of the L.E. cell has been shown to depend upon an abnormal factor present in the gamma-globulin fraction of the patients suffering from lupus erythematosus.

Although L.E. cells have been found most often and in greatest number in the acute and subacute varieties of lupus erythematosus, they have also been found in a few cases of the chronic discoid variety and occasionally in small numbers in other diseases. In a few cases of systemic

lupus erythematosus these cells could not be found ever after repeated search. Thus the significance of the L.E. cell is not finally settled.

In the present case L.E. cells were found only after A.C.T.H. had been given, and not before the start of treatment. Haserick (1951) and Michael *et al.* (1951) report a similar finding in cases treated with cortisone. Haserick thought that in his case the initial negative finding may have been associated with the low level of gamma globulin in the plasma resulting from marked proteinuria. A positive L.E. test was obtained eight days after starting cortisone therapy. The interval between starting cortisone and the finding of the L.E. cells is not stated in the case of Michael *et al.* (1951).

Although the original plasma globulin was raised in the present case, estimation of the separate fractions was not undertaken. Perhaps this might have shown the gamma fraction to be low and thus account, as in Haserick's case, for the negative result. There was no proteinuria at this time, and, although the blood urea was elevated, it has been shown that the *in vitro* addition of urea does not inhibit the formation of L.E. cells (Haserick, 1951).

Another explanation might be that the A.C.T.H. had in some way stimulated the production of the L.E. plasma factor contained in the gamma-globulin fraction. On the other hand, it is realized that L.E. cells may disappear during treatment with A.C.T.H. or cortisone, although cortisone *in vitro* has been shown to exert no inhibitory effect on the plasma factor (Haserick, 1950).

From the practical point of view it is suggested that when initial negative L.E. cell examinations have been obtained repeated tests should be undertaken, and in some instances it might be justifiable to administer A.C.T.H. or cortisone provocatively. So far as I am aware L.E. cells have not been demonstrated in other diseases following the use of A.C.T.H.

The reappearance of L.E. cells in the peripheral blood occurred at a time when the patient was symptom-free. Other laboratory findings were normal, and the E.S.R. was still falling, although it had not returned to normal. The presence of L.E. cells was thus the first indication of the relapse that was to follow, and therefore was of prognostic value. Haserick (1951), however, thought that the finding of these cells is an indication of systemic involvement and not of value in prognosis. He also found that as the general condition improves the number of L.E. cells diminishes and may even disappear. There is no doubt that the finding of L.E. cells is a valuable aid in the diagnosis of systemic lupus erythematosus, and, although many other diseases have been investigated, positive results have only rarely been reported (Berman *et al.*, 1950).

It was originally thought that anticoagulants were necessary for the demonstration of L.E. cells, but their presence has been shown to be unnecessary (Eppes and Ludovic, 1951; Marten and Blackburn, 1953).

I am very grateful to Drs. H. R. Vickers and I. B. Sneddon for permission to publish this case and for their constant help and encouragement, and to Dr. E. K. Blackburn for the haematological findings and help in the preparation of this paper.

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Reviews

BRINGING HEALTH TO AFRICA

African Highway: The Battle for Health in Central Africa. By Sir Malcolm Watson, M.D., C.M., D.P.H., LL.D. With introduction by Sir Eric Macfadyen. (Pp. 294; illustrated. £3 3s.) London: John Murray. 1953.

The discovery of copper in Northern Rhodesia led to the establishment of four mines situated from thirty to sixty miles apart across the so-called Copper Belt. During the preliminary stages of the construction of the camps it became obvious that tropical diseases were rampant in the area and that, unless active measures were taken, ill-health would inevitably ruin the enterprise. In 1929 the mine directors sought advice from the Ross Institute of Tropical Hygiene, where Sir Malcolm Watson was at that time director of the Department of Malaria. Practical guidance and help were at once forthcoming, and a team of experts was dispatched to investigate the situation and carry out whatever recommendations they made. In this they received the active support of the mine officials.

Part I of this book describes the measures which brought about the evolution of the original primitive disease-ridden camps into the healthy up-to-date settlements which now occupy the same sites. The author acts as compère to a series of articles written by mine officials, medical officers, and research workers, together with copious extracts from official reports, and himself writes many chapters. The principal disease was malaria, and the vectors were *Anopheles gambiae* and *A. funestus*. The former was controlled without great difficulty, but the latter presented many problems which would have daunted a less experienced malariologist than Sir Malcolm. By the application or modification of methods which he had evolved in Malaya, mosquito breeding was quickly brought under control. As often happens, the recession of malaria was accompanied by a corresponding improvement in the general health of the community, which was aided in no small measure by a progressive housing policy and strict attention to general hygiene and sanitation. The results can be assessed from the annual death rates among the African workers, which fell from 34.6 to 6.6 per 1,000 between 1930 and 1938. Perhaps an even more significant pointer is the fact that in 1946 the life insurance rates in the Copper Belt were the same as in the Witwatersrand and other parts of South Africa.

The second part of the book gives some account of matters which have an important bearing on the health and well-being of the African village.

African Highway is neither a textbook nor, strictly speaking, a book of reference, though it contains in an easily accessible form a great deal of information of interest to those concerned with health problems in Africa. Rather it is a record of an outstanding achievement in tropical hygiene which redounds to the credit of the industrialists who had the vision to give it their unstinted support. It is not inappropriate that this book should be published in the year of the Rhodes centenary, for, as the author points out, the story it tells gives much food for thought to those who are disposed to denigrate so-called imperialism and private enterprise.

J. S. K. BOYD.

LUNG RESECTION

Die Lungenresektionen. By Professor A. Lezius. (Pp. 143; 149 figures. M. 49.80.) Stuttgart: Georg Thieme. 1953.

This monograph is based on a personal experience of about a thousand cases of operations on the lungs carried out in the university clinic of Hamburg by Professor Lezius. It deserves the most careful study by every surgeon engaged in this special field. It is in two sections. The first or general section deals with the indications for resection of the lung,

carcinoma, bronchiectasis, chronic infections, tuberculosis, and non-malignant tumours. The main characters of each condition are discussed in brief but accurate detail. A description follows of the investigations required to establish the possibility of operation, where due weight is given to pathological anatomy and essential features of the patient's condition. The author then considers the general technique of operations on the lungs, and describes in precise detail the closure of the pulmonary root.

The special section describes in succession the exact and varied technique required for resection of the different lobes of the lung. In every instance the methods are illustrated by large-scale drawings of great precision and superb draughtsmanship, in which every detail of each operation can be followed with ease. They form a remarkable tribute both to the skill of the surgeon and to the patience of the artist. The section concludes with an interesting and important account of closure of tuberculous cavities by resection of the bronchus.

Based as it is on a wide practical experience and most careful work, the volume is an example of all that a monograph should be on a new and difficult field, success in which has been achieved only by recent advances in our knowledge of the anatomy and pathology of the lungs, the discovery of antibiotics, and new methods of anaesthesia. It is of interest that the author regards as most important of all the rise of the professional anaesthetist in Germany, a circumstance which may have an effect on Continental surgery quite outside the region of the chest.

HENRY SOUITAR.

THE PHARYNX

The Pharynx: Basic Aspects and Clinical Problems. Edited by Professor Abraham R. Hollender, M.D., F.A.C.S. (Pp. 560; illustrated. £5 10s.) Chicago: Year Book Publishers, Inc. London: Interscience Publishers Co. 1953.

In his preface the author writes: "Recent developments and advances in Medicine in general and in Otolaryngology in particular have made it desirable that there should be available for students and practitioners a separate work dealing with direct and related problems concerning the Pharynx." Since all parts of the upper respiratory tract are anatomically continuous, the wisdom of separating off one part is doubtful for the instruction of the student. Further, it is impossible to avoid some inclusion of adjacent parts. Dr. Hollender has invoked the collaboration of nineteen colleagues, and some overlapping and repetition are unavoidable. And as the contributors write in great detail on their special subjects the student at least will find the reading heavy going. Fortunately the editor has written a foreword to each chapter and at its end has summed up the gist of the article, giving an appreciation of its contents. Both of these are so good and clear that the student might confine his reading to them. The advanced inquirer will find detailed knowledge on the pathological and clinical problems of all aspects of the subject and a wealth of facts and opposing opinions. There is, too, a comprehensive list of references at the end of each chapter. As is to be expected, the references are mainly to American literature, though a few British are included; but one misses some that are standard in this country.

The book is divided into thirty chapters. The first six are respectively on anatomy, physiology, pathology, bacteriology, methods of diagnosis, and x-ray examination. The last is admirable—profusely illustrated with clear reproductions of radiographs of all possible lesions. There follow four chapters on the clinical problems of the nasopharynx; the fourth is on stenosis of the posterior choanae, and operations for its relief are described in detail, with illustrations that should be helpful to the surgeon faced with one of these rare cases. Eight chapters are devoted to the mouth and oropharynx; the one on the manifestations of blood diseases is full and instructive. For removal of tonsils it does not appear that the Davis gag is used. For children under 16 open ether is advised, a view that certainly would

not appeal either to the patient or to the surgeon in Britain. For adults local analgesia is advocated. The uvula, salivary glands, and infections in the neck are considered in the next section. There are clear pictures of the fascial planes and the spread of infections in relation to them, but enough stress is not laid on how much fewer and less dangerous these infections have become since the advent of the antibiotics.

Tuberculosis, syphilis, and neoplasms are described adequately and their treatment given in detail. The statement that tuberculous lesions are comparatively common in the nasopharynx has not been recognized in British textbooks. A chapter on the relation of tonsillectomy and poliomyelitis is excellent. Opinions for and against operation during epidemics are supported by many statistics, but leave the question open. The final advice is to avoid operation during the summer months, when poliomyelitis is at its worst. The discussion on tonsils and rheumatism brings out the opinion generally held in Britain.

Shortly, this work is a book of reference for the E.N.T. specialist. The illustrations are unequal in quality; some are good, notably those of radiographs and pathological sections, but the clinical ones need knowledge for their interpretation.

W. M. MOLLISON.

EXAMINING THE NERVOUS SYSTEM

Diagnostic Tests in Neurology. A Selection for Office Use. By Robert Wartenberg, M.D. Forewords by Sir Gordon Holmes, M.D., F.R.S., and Stanley Truman, M.D. (Pp. 228; 62 figures. \$4.50 or £1 13s.) Chicago: The Yearbook Publishers, Inc. London: Interscience Publishers Ltd. 1953.

The author, who works at the University of California School of Medicine, thinks that diagnosis in neurology, as in some other branches of medicine, is coming to depend too much on laboratory and other special methods of investigation, while the bedside examination of the patient is too often neglected. His book is an attempt to correct this fault, and he clearly describes a large number of simple methods of neurological examination and the conclusions that can be drawn from them. He does not attempt to give a systematic account of examination of the central and peripheral nervous systems, nor does he mention some important aspects such as the investigation of disturbances of speech. The numerous tests are well described and many are illustrated. Some of them are rarely used in Britain, and might with advantage be adopted. In his account of the signs of a lesion of the pyramidal tract he refers to eversion of the foot on the affected side, but what he is in fact describing and illustrating (p. 109) is external rotation of the hip and not eversion of the foot. His account of the reflexes, of which he has previously published a detailed study, is especially good, and he rightly avoids the use of eponyms to describe various ways of eliciting the same reflex; but it is doubtful whether his name of "triceps surae reflex" is ever likely to replace the more familiar "ankle jerk." This book is a useful addition to accounts of clinical examination of the nervous system.

J. W. ALDREN TURNER.

ROYAL VICTORIA HOSPITAL, BELFAST

Fifty Years on the Grosvenor Road: An Account of the Rise and Progress of the Royal Victoria Hospital, Belfast, during the Years 1903-1953. By Robert Marshall, M.D., F.R.C.P., F.R.C.P.I., D.P.H. (9, College Gardens, Belfast.) (Pp. 139; illustrated.)

The Royal Victoria Hospital, Belfast, had its origin in the year 1792 in a house, but as the city grew the need for larger premises led to the building of a hospital of 100 beds in 1815 and the increase in the number of beds to 186 in 1870. In 1903, when the population of the city was 350,000, the present fine hospital in Grosvenor Road was opened. The (then) new hospital was original in design, with clerestory lighting and the plenum system of ventilation, but in the course of 50 years many alterations and additions have taken place, and it is the story of this period

of development in the new building that is graphically described in this book of 137 pages. The history of the Belfast General Hospital has already been written by Malcolm (1851), and the intervening period awaits a historian.

The author divides the 50 years into 10 quinquennia, and in each period he first gives the main events of world history followed by a description of the chief changes in the hospital so that (as he intended) the pageant of the growth of the hospital passes before us with the panorama of the world's activities as a background. This method makes it a little difficult to read the book straight through, but it serves to give a proper perspective to the picture.

Many famous medical men have come from the Queen's University and from the Royal Victoria Hospital, and an account of many of them will be found in this book. Many of them (85%) have sought a career in other countries, chiefly in England, rarely in Scotland. The reader will note with interest that the distinguished men who 12 years ago were elected respectively President of the Royal College of Physicians and President of the Royal College of Surgeons of England, and who later were both created peers, were both of them sons of graduates of the old Queen's University of Ireland.

This is a faithful account of a celebrated institution which will be welcomed by all who have been connected with it, and it contains many facts which will be of interest to a much wider circle. We wish there had been an index of names.

ZACHARY COPE.

HINDU PSYCHOLOGY

Mental Health and Hindu Psychology. By Swami Akhilananda. Introduction by Professor O. Hobart Mower. (Pp. 229. 16s.) London: George Allen and Unwin. 1952.

In Hinduism the philosophic background of religion in the widest sense cannot be reached without mental training, and so religion and psychology are inseparable. Hence the place given to the technical training of the mind by Hindu thinkers. Our author, after long residence in America, believes that Hindu psychology has some qualities missed by Western psychology. The relative failure of much psychological treatment, particularly psycho-analysis, he attributes to the almost total separation of religion and psychology.

His argument is that acceptance of the pleasure principle as a primary objective in life must lead to repression. But this is a wrong objective. Hinduism teaches that transformation of the emotions obviates repression. The standard of life in America, judged by wages and physical amenities, is high. If the resources of science could remove mental ill-health, America would be free of it. But mental disabilities are increasing, owing to an inherent defect in the customary Western outlook on life. In Hindu thought, the ideal is the unfolding of inner possibilities. "In the west, the problem is how much a man can possess . . . in India the problem is, on how little a man can live." When the comforts of the world are paramount the result is apprehension and anxiety.

Freud and his followers, who regard religion as illusion, come in for criticism; they lack a personal understanding of religion itself. To explain religious strivings in terms of a preconceived hypothesis produces distortions, not interpretations, of religious experience. The damage to human society arising from a confusion of mature and immature religious sentiment is immense.

The complacency of some psychiatrists and their facility in providing psychopathological explanations for all human frailties is no guarantee that they have the answers. This volume does not claim to provide all the answers, but it does claim, with justification, that there is much in Hindu thought which could enrich Western psychological thought and practice.

E. A. BENNET.

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THE CARDIFF MEETING

The only thing over which the organizers of the Cardiff meeting had no control was the weather. With everyone contributing so much and so freely, the skies, not to be outdone, determined to show that in the United Kingdom Welsh rain was as good as anywhere else. It dampened a few clothes but no one's spirits. The topography of the Civic Centre, the glory of Glamorgan and of Wales, was quickly mastered by the visitors, and a quick dash from the City Hall to University College took one easily from one form of splendour to another. It was in the City Hall that a fortunate few from the B.M.A. had the privilege of lunching with the Queen. It was in the City Hall that the Representative Body met during three of its four daily sessions. And it was here that distinguished doctors of Britain, Canada, the U.S.A., and Sweden received their honorary degrees from the University of Wales. This was as it should be, because Cardiff as a city identified itself with the B.M.A. for the ten days of its meeting more closely, perhaps, than any city in any previous meeting. The Lord Mayor, Sir James Collins—knighted by the Queen on the first day of the meeting—was a host in himself, and was benevolently present on numerous occasions, saying the right word at the right time, and never too long at that. His example of kindness was followed by the policeman in the street, by the trolley conductor, by the shopkeeper, the hotel staffs, and by the taxi driver (English in origin) who said that Llandaff was the largest city in Europe. For many, if not most, of the visitors, Cardiff was previously but a local habitation and a name. But they soon learned that it was a centre of civilization, a city rightly proud of its civic advancement, of its contributions to learning, of its bustling prosperity, of its spotless cleanliness in the midst of coal and steel and great ports. Within the confines of the castle the remains of a Roman wall and a Norman keep are monumental reminders of Cardiff's long history, and the Tudor rose set on three ostrich feathers in the city's crest bears witness to the close historical relationship between the land of the Saxons and the Angles and the land of the Ancient Britons.

It was in the City Hall too that the retiring President, Dr. P. T. O'Farrell, invested with his chain of office the new President, Mr. J. W. Tudor Thomas, around whose person the Annual Meeting revolved. The ethnologist a millennium hence may detect in these annual meetings of the Association a pattern which has the qualities of a ritual dance in which the Church, the State, and the local citizens join with the profession of medicine, celebrating by speech and ceremony their interrelated works for the health of society. Mr. Tudor Thomas moved through the complicated ritual with dignity and a self-effacing ease which belied the unremitting effort and attention to smallest detail he has given in preparing those many activities the sum of which set the seal of success on a meeting which combines traditional ceremony, the hard business of medical politics, and scientific exposition. There was so much to do, so much to see, so much to learn, that at times the visitor found it hard to choose between alternative functions proceeding simultaneously. If the President, by his qualities of mind and character, compelled the visitors' admiration, Mrs. Tudor Thomas captured their hearts with her grace, friendliness, and charm. Seldom have the ladies who come to these meetings as wives and daughters been so surrounded with thoughtfulness and pleasure. It is always invidious to mention among so many the names of those who helped the President in his task, but Dr. John D. Spillane, the honorary local general secretary of the meeting, deserves special thanks. Needless to say, the arrangements for receiving and entertaining the visitors made by the various local committees, not forgetting the ladies' committees, went with a swing from start to finish.

As science secretary, Professor Gilbert I. Strachan, who was general secretary of the Cardiff meeting in 1928, may well feel satisfied with not the least important aspect of an Annual Meeting. There was a good attendance at the seventeen scientific sections, and welcome confirmation of the value of the experiment started last year in Dublin—the holding of plenary sessions in which panels of experts make their varying contributions on subjects of general interest and in which members of the audience can subsequently take part. The three subjects chosen this year—coronary disease, "fibrositis," and overweight—proved attractive to large audiences, and the chairmen and speakers had learned much from the Dublin experiment. There can be no doubt the plenary sessions have come to stay, and will prove to be of increasing value and interest to the general physician. This year the section on child health arranged a panel discussion on the care of the newborn—an innovation which

proved to be highly successful and worthy of imitation at subsequent meetings. At Dublin last year a scientific exhibition was staged for the first time. Again, many lessons were learned as a result, and those who planned the exhibition this year showed how well they had learned them in putting on a scientific exhibition of exceptional interest and merit, though there is still room for more simplicity in presentation. Especially notable were the exhibits of the Departments of Pathology and Bacteriology of the Welsh National School of Medicine and of the M.R.C. Pneumoconiosis Research Unit, Cardiff. In the trade exhibition this year there was an attractive display of drugs, appliances, and books of value to doctors in their daily work. It was unfortunate that these two interesting and helpful exhibitions were housed—though excellently housed—just far enough away from the main meeting-places to make attendance at them a bit of an effort. And hosts at Cardiff in their generous hospitality filled the day so full that it was difficult to give the time to these exhibitions they so well deserved.

So another B.M.A. year comes full circle. Mr. Tudor Thomas and his colleagues and the Cardiff Division can look back at the result of their labours with the satisfaction that comes from doing well a job that was worth doing, and they carry forward with them the gratitude of those who attended a memorable meeting and the affection of old and new friends. All who went to Cardiff for the first time last week will be anxious to return there.

THE A.R.M.

This year's Annual Representative Meeting was faced with a full agenda, and on the first day its business was happily interrupted by the visit of the Queen to Cardiff. In spite of this the meeting came to an end at a reasonable hour on the Monday, and no important item on the agenda was scamped. The Representative Body, if in a congenial mood, was thoroughly alert and the hall of the meeting was always full. Dr. S. Wand, who was unanimously elected for another year as Chairman of the R.B., conducted the business of the meeting in a masterly fashion, and also showed himself on other occasions as an admirable spokesman for the Association.

The meeting was fully reported in last week's *Supplement*, and here reference may be made to some of the outstanding matters debated. Perhaps the most important was the motion from the Winchester Division, which was carried, that a Constitution Committee should be set up to "consider and report on a reorganization of the Representative Body

and such other constitutional matters as the Council may decide." It was also resolved that not more than 50% of the members of this committee should be members of Council. The jubilee year of the Representative Meeting is an appropriate time to choose for a review of the Association's constitution. The position of the profession and of the B.M.A. in relation to their work and especially to the State is vastly different from what it was in 1903. Each section of the profession in a nationalized health service has its own peculiar problems, and in attempting to solve them two powerful autonomous committees of the Association have been active over a very wide field—a field co-extensive with general and consultant practice. It would seem inevitable that their place in the B.M.A.'s constitution will be looked at afresh, as well as such other matters as the size of the Representative Body and the way in which it is constituted. At the meeting general practitioners showed their concern over the possible interference with their work by industrial medical officers and health visitors—a matter principally, it would seem, of establishing good relationships. In the Lincolnshire motion (carried) urging the establishment by the Ministry of Health of geriatric units, the voice of the general practitioner was again heard expressing fear that another part of his work might be taken out of his hands. Other motions showed that practitioners continue to press for general-practitioner hospitals and for better access to diagnostic facilities—and their concern for their patients was expressed in the vote given against the shilling tax on prescriptions.

The debate on a motion (carried) that the Council of the Association "should produce a scheme for the return of goodwill" and report to the R.B. next year showed there is still a lively interest in the buying and selling of practices, and that experience of the past five years has convinced many that the abolition of this custom has, as one speaker put it, caused as many difficulties as it set out to solve. But, as Dr. Wand pointed out, the passing of the motion has not altered the Association's policy: the Council has been instructed to produce a scheme, and the policy of the Association in relation to it will be determined when that scheme is presented to the R.B. next year in Glasgow. The outstanding matter in the report of the Central Consultants and Specialists Committee was the remuneration of hospital medical staffs. Dr. T. Rowland Hill, in presenting the report, made it clear that his Committee was insisting on the implementation of the Spens Report, "which had been publicly accepted by the Government immediately before the inauguration of the Service, and which had also been accepted by the medical profession." Any wavering

on this would be of the greatest disservice to the consultants of to-day and to-morrow. The unanimous vote of the R.B. in support of the consultants' claim has given them a firm backing. Linked with this theme is one of immediate importance—the establishment of an independent Court of Arbitration. It is incredible that the Minister of Health and the Secretary of State for Scotland have recently refused to meet the Staff Side of the Whitley Councils to discuss this matter, especially as in 1947 the then Minister of Health promised to help if there were any difficulty in setting up the Whitley machinery. The absence of an independent Court of Arbitration to which either side may have the right to take a matter in dispute is something that cannot be tolerated much longer, and Dr. K. Cowan, in presenting the report under "Public Health," put the whole matter before the R.B. with great clarity. As the Chairman of Council, Dr. E. A. Gregg, said earlier in the meeting, arbitration is "a right which is a matter of common human justice"; and it is a right which the Association will press with every determination to secure.

MORBIDITY OF CHRONIC RHEUMATISM

One of the most important aims of the Health Service must be to relate the hospital service to the needs of the community. Clearly, accurate knowledge of the morbidity of various diseases is needed if it is to succeed. In certain groups of diseases, especially those of low mortality, this information is difficult to come by, and, as the Empire Rheumatism Council has recently pointed out, particularly is this so for the chronic rheumatic diseases. The Newman Report¹ of 1924 was based on general practitioners' records and referred only to employed people covered by National Health Insurance, thus excluding large sections of the population. Although Dr. J. Alison Glover wrote his classic report in 1928² from the Ministry of Health drawing attention to the need for special study of this group, little further official action was taken until 1945, when the Department of Health for Scotland published the results of a further survey³ subject to much the same defects as the Newman report. Fortunately, as a result of a generous gift from the Nuffield Foundation, a Department of Rheumatism Research was founded⁴ in 1947 in the University of Manchester, and at last it has been possible to carry out a field survey, giving adequate information. This survey, of the industrial town of

Leigh in Lancashire, of about 50,000 inhabitants, was on a carefully calculated sample of 3,515 inhabitants over the age of 15. The results have been published by Drs. Kellgren, Lawrence, and Aitken-Swan,⁴ and they are of the greatest interest both to clinicians and to administrators.

While the more advanced cases of rheumatoid arthritis, osteoarthritis, ankylosing spondylitis, and gout are clearly recognizable, the earlier cases may not be, although, as in other diseases, the more expert the examiner the earlier the diagnosis. The "large variety of more transient painful syndromes, which are usually called fibrositis, neuritis, or lumbago" are less easily defined, and where these workers were unable to make a firm diagnosis they wisely classified them as indeterminate. The controversial and perhaps fashionable "slipped disk" had to be faced, and they divided cases into two categories: the frank prolapse, and disk degeneration, the former being less common and occurring in younger people.

Among the mass of interesting information that comes out of this study we learn that the overall complaint rate was 33% over the previous five years and 19% at the time of the survey. 4.5% of the males and 7.9% of the females were suffering from osteoarthritis, 1.4% and 3.3% from rheumatoid arthritis, and 4% of the males had symptoms referable to a disk lesion. The findings in the older people are of special interest in view of their increasing proportion in the population. Of the females over 60 25% had osteoarthritis; 4% of the males and 9% of the females had rheumatoid arthritis. The vertebral disk is a greater cause of symptoms in males, cases being twice as common as in females. The maximum incidence (12%) occurred in the fifth decade of life, though in the fourth decade 7% had symptoms. The undetermined diseases affected an earlier age group than osteoarthritis or rheumatoid arthritis, and the incidence fell off with increasing age, when the incidence of osteoarthritis or rheumatoid arthritis was rising, suggesting that at least some of them are due to as yet undiagnosable manifestations of these diseases. Half the patients with rheumatoid arthritis lost no working time, showing that rheumatoid arthritis is by no means necessarily a crippling disease. Nevertheless, 20% of the males and 31% of the females lost three months' work or more during the preceding five years. Disk disorders were also an important cause of lost working time, and even in the undetermined groups some 30% of affected males had lost one week or more and 6% as much as three months from work. As to the economic effects of these disorders, they must be more impoverishing to the country than is commonly realized.

The consultation rate with the general practitioner varies with the condition. In the undetermined group it was as low as 50%, but of men with rheumatoid arthritis only 19% failed to consult their doctors, and a similar figure applies to those with disk disorders. Of the women 38% with rheumatoid arthritis and 50% with osteoarthritis failed to consult their doctors. The triviality of the symptoms is not the only reason for failure to see the doctor; the general belief that rheumatism is incurable accounts for part of it undoubtedly. Perhaps the most disturbing feature of the whole story is the figure for attendance at hospital. The numbers of patients referred correspond with the numbers of those losing three months or more of work, and then only a quarter of these obtained in-patient treatment. Curiously, patients with equivalent disability from disk disorder or undetermined pain are more frequently sent to hospital than patients with rheumatoid arthritis.

The writers of this report are careful to point out that these figures apply only to an urban industrial community in the north-west of England. The results of the East Anglian Survey carried out in a similar manner on a rural community are awaited with great interest. The report deserves the most careful study by all concerned with the planning of the hospital services from the Minister downwards, and it is to be hoped that every regional board and board of governors will examine its implications.

MEDICINES CLASSIFIED

Doctors in the National Health Service—whether in general practice or hospitals—will have received from the Ministry or Department of Health a list of proprietary medicines classified by the Joint Committee on Prescribing of the Central and Scottish Health Services Councils. This Committee was appointed in 1949, under the chairmanship of Sir Henry Cohen, to consider whether it was desirable and practical to restrict or discourage the prescribing by general practitioners of drugs and medicines of doubtful value or of unethical character, and of unnecessarily expensive brands of standard drugs. In an interim report in June, 1950, the Committee gave its views on the questions put to it in terms of reference. It asserted that absolute restrictions on prescribing were impracticable. A doctor must be free to prescribe any drug which in his opinion was necessary for the patient. The Committee, however, thought that the prescribing of certain proprietary preparations could, and should, be discouraged. For instance, those advertised to the public should be avoided on the grounds that the responsibility for prescribing should rest entirely with the doctor. The Committee went on to suggest the classification of proprietary preparations as a

guide to economy in prescribing. Six categories were proposed: (1) new drugs of proved value not yet standard; (2) proprietary brands of standard drugs, singly or in combination; (3) standard preparations, and new remedies of proved value, in elegant form or vehicle; (4) qualitative and/or quantitative modifications in the composition or combination of standard preparations, or new remedies of proved value, which are not accepted as therapeutically superior to preparations included either alone or in combination in the *British Pharmacopoeia*, *British Pharmaceutical Codex*, or *National Formulary*; (5) preparations not in the *British Pharmacopoeia*, *British Pharmaceutical Codex*, or *National Formulary* which in the Committee's view have not been proved of therapeutic value; (6) preparations which are a combination of (4) and (5).

Apart from preparations in categories (5) and (6) the Committee did not suggest that these proprietary preparations should not be freely prescribable in the National Health Service, except when advertised direct to the public. It recommended that proprietary preparations in category (1) should be freely prescribable, and that preparations in categories (2), (3), and (4) should be prescribable subject to their not being designated as foods or toilet preparations, or not as drugs for N.H.S. purposes by the Definition of Drugs Joint Subcommittee; their not being advertised direct to the public; and satisfactory arrangements for price being made between the Health Departments and the manufacturers.

The lists now circulated with a covering letter from the Chief Medical Officer represent a review during the last two and a half years of some 5,000 preparations. So far only those falling into categories 1, 5, and 6 have been classified; those not mentioned may be assumed to be in categories 2, 3, and 4. Additions and amendments will be made from time to time. Arrangements for pricing medicines in categories 2, 3, and 4 are now under discussion with the manufacturers and a list of prices is being prepared for circulation to show the cost of standard and proprietary preparations in the *National Formulary* and other proprietaries.

Whether the hard labour of Sir Henry Cohen's Committee will have a commensurate effect on the drug bill remains to be seen. It is good that its recommendations are to be circulated to hospital staffs. As for the already paper-bound general practitioner one wonders if the irritation of more printed reference matter will defeat its purpose. For a busy general practitioner to be asked, as the Chief Medical Officer does in his letter, "only to prescribe preparations not included in the enclosed lists after you have ascertained the cost and compared it with that of identical or similar standard preparations and not to prescribe preparations of which the price is not readily and conveniently ascertainable" promises on the face of it some forbidding research. His request that "both the frequency and the quantities of orders for standard products" should be reduced is practical and should be complied with. A welcome reaffirmation of the doctor's right to prescribe whatever he thinks necessary is overshadowed by a reminder that he may be called upon to justify himself before a local medical committee. The

¹ *The Incidence of Rheumatic Diseases*, 1924, ed. G. Newman. Ministry of Health Reports on Public Health and Medical Subjects, No. 23. H.M.S.O.
² Glover, J. A., *A Report on Chronic Arthritis*, 1928, Ministry of Health Reports on Public Health and Medical Subjects, No. 52. H.M.S.O.
³ *Chronic Rheumatic Diseases*, 1945. Report of the Medical Advisory Committee (Scotland). H.M.S.O.
⁴ *Ann. Rheum. Dis.*, 1953, 12, 5.

reader might be forgiven if he recalls a certain lord high executioner who sang:

"Some day it may happen that a victim must
be found,
I've got a little list—I've got a little list."

However, the cost of prescribing threatens to jeopardize much-needed improvements in the National Health Service, and it is the duty of all who prescribe to respond with good will to any appeal for co-operation in any reasonable measures of economy.

THE BANNING OF HEROIN

Diamorphine, or heroin, is the most potent drug of addiction known. Addiction to it is produced more rapidly than to morphine, and it is generally agreed that the subsequent effects are worse. The addition may on occasion become a danger to society as grave as an epidemic of virulent infectious disease. Thus in Egypt in 1930 it was estimated that, out of a population of 14 million, 500,000 were diamorphine addicts, and most of them were young men. Although the incidence of this addiction has been reduced since then by vigorous restrictive measures, it still constitutes a formidable problem in many parts of the world, particularly in Finland, in the United States, and in Middle Eastern countries. Fortunately it is insignificant in Britain, where there are at present not much more than 300 registered drug addicts, and of these only about 60 are addicted to diamorphine.

In 1949 the World Health Organization's Expert Committee on drugs liable to produce addiction agreed that, although 50 countries had banned the use of diamorphine, adequate control of the illicit traffic in it would not be achieved until the ban was world-wide. The Committee therefore decided to renew its attempts to persuade the remaining countries, particularly the United Kingdom, which exports large quantities of diamorphine, to make the manufacture and use of the drug illegal. It was pointed out that a world-wide ban on its production would greatly facilitate the fight against the illicit drug traffic, as control bodies would then know that diamorphine discovered anywhere could only be contraband. In May of this year a further unanimous recommendation was made at the Sixth World Health Organization Assembly that the production and importation of diamorphine be abolished throughout the world.

If diamorphine were an essential and unique drug with no satisfactory alternatives it would be unjustifiable to ban its use in this country simply because it is abused in others. It thus becomes of interest to inquire to what extent diamorphine is an indispensable drug. The conclusion of properly controlled studies, as distinct from empirical clinical impressions, which are notoriously fallacious, is that diamorphine is qualitatively almost identical in its action with morphine, is somewhat more powerful (hence the smaller dose), and is relatively more toxic. Much has been said about the advantages of diamorphine over morphine, but these are probably only two in number: its psychological effects are more

pleasurable (hence its greater danger as a drug of addiction), and it is somewhat less nauseating. For these reasons it is probably the drug of choice, though by no means irreplaceable, in the terminal stages of painful incurable disease, and some surgeons consider it superior to morphine as a post-operative analgesic, especially for children, not only because it is a little less nauseating but also because of its undeserved reputation for being less constipating. If these are the only indications for the use of diamorphine in preference to other drugs, they do not perhaps constitute very convincing arguments for its indispensability in comparison with the cogent reasons for its abolition. The situation now is different from what it was, because other morphine derivatives are available and powerful new synthetic analgesics such as amidone and pethidine have been introduced. If appropriate choice of these remedies is made, and if they are skilfully used in proper dosage, the necessity to use diamorphine must be slight. In Britain 50% of the diamorphine goes into cough linctuses. Such preparations have no particular advantage over those containing opium, morphine, amidone, or codeine in adequate dosage, and the loss of diamorphine as a cough suppressor would therefore not be a serious disadvantage. It is significant that the monograph on diamorphine hydrochloride has been omitted from the 1953 *British Pharmacopoeia*. There would thus be the most respectable precedent for Government authorities should they decide on the revolutionary step of making the use of the drug illegal in Britain.

A MEMORIAL TO SIR JACK DRUMMOND

It is nearly a year ago since Sir Jack Drummond, his wife, and daughter were brutally murdered while on holiday in France. Lord Woolton, in letters to *The Times* and *Daily Telegraph* last week, recalls Drummond's work as scientific adviser to the Ministry of Food during the war, work which led to the introduction of measures "that have left their permanent mark on the social structure of our country." In order that Drummond's outstanding contribution to his country's victory in the war and his countrymen's welfare if peace should not be forgotten a committee has been formed under Lord Woolton's chairmanship for the purpose of obtaining funds to endow a Drummond Research Fellowship in the subject of nutrition. "This fellowship," Lord Woolton writes, "would cost about £25,000, would be administered by a body of university trustees, and be tenable in any university or appropriate research institution." Among the members of the committee who join with Lord Woolton in this appeal are Lord Horder, Professor E. C. Dodds, and Sir Harold Himsforth. Doctors have had better opportunity than most to observe the benefits to health which have followed the practical application of the advice that Drummond gave the Government during the war, and they will give unqualified approval to the method that has been chosen of perpetuating his name.

*The address of the Drummond Memorial Fund is c/o The Westminster Bank Ltd., 154, Harley Street, London, W.1.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

INDIGESTION IN CHILDHOOD

BY

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Indigestion, or dyspepsia, occurs frequently in childhood, and it may be acute or chronic. Sometimes the symptoms are due to a particular disease, such as hepatitis or tuberculous peritonitis, that can be recognized and demonstrated; but many patients with indigestion recover without a definite pathological cause being discovered. It is to these patients that I want especially to call attention, and for two main reasons: though recovery takes place the child suffers discomfort and his parents have a worrying time; and the doctor may be faced with a perplexing clinical problem while he is searching for the cause of the illness. To compare dyspepsia with other examples of disordered function, such as dyspnoea or dysuria, is to realize that careful clinical examination, supported when necessary by special investigations such as radiography, blood studies, etc., will usually show the reason for a child's shortness of breath or difficulty with micturition; but the cause of dyspepsia often remains a matter for speculation. Has it been due to some peculiar sensitivity to certain foods? Is it that the secretion of saliva, or of gastric juice, of trypsin or bile, is temporarily disordered? Has the detoxicating action of the liver decreased temporarily? There are many possible theories and explanations, and the doctor—perhaps feeling dissatisfied with "indigestion" as a diagnosis—should have a satisfactory plan to follow.

There are four stages in the medical handling of these cases. The first is to recognize the clinical picture (grouping of symptoms and signs) justifying a provisional diagnosis of indigestion; the second is to consider, and if possible exclude, those pathological states that might be responsible for the symptoms and signs noted; the third is to weigh up the possible effects of (a) constitutional type; (b) faults in dieting; (c) unhygienic habits; (d) subnormal general health, and (e) nervous factors in causing the illness; and the fourth is to recommend treatment. It is not, of course, intended that these stages should be considered independently; each has a relationship to the others, and together they form a basis for the proper study of each case. In discussing them I shall begin by taking stages one and two together, dealing first with the acute and then with chronic indigestion.

Acute Indigestion

The common symptoms of acute indigestion (due, for instance, to overeating, or to taking unsuitable food) are malaise, then nausea, then vomiting, and sometimes abdominal pains of a colicky type. Diarrhoea may begin soon after vomiting has started, and the motions quickly become watery, and perhaps green in colour. The temperature may rise to about 99.5 or 100° F. (37.5 or 37.8° C.) after the child has been ill for an hour or so. His breath often becomes offensive, his tongue quickly shows a coating, and frequently he looks pale and anxious. Dehydration may develop if there is much vomiting or diarrhoea, but by this time the provisional diagnosis of indigestion may have been

discarded in favour of, say, acute gastro-enteritis. Acute indigestion may be expected to subside within two or three days, but illness such as gastritis, gastro-enteritis, and enterocolitis usually last longer, and vomiting or diarrhoea—or both—are likely to be more persistent.

Every child presenting the clinical picture described above should be carefully examined at least once daily until recovery has occurred or an alternative diagnosis has been made. There are, of course, many illnesses that begin with nausea and vomiting, abdominal discomfort, coating of the tongue, and other symptoms commonly found in simple indigestion, and experience shows that confusion occurs particularly with the following:

Tonsillitis and sometimes pharyngitis. (The throat of every ill child should be examined, with a good light.) The temperature usually rises quickly, the tonsillar lymphatic glands are often found to be slightly tender when carefully palpated, but few children with tonsillitis complain that the throat feels sore. There may be pain and tenderness in the right iliac fossa—sometimes resulting in an unnecessary appendicectomy.

Pneumonia, especially in the earlier years of life. It is important to note even an occasional cough, tachypnoea, and movements of the alae nasi. Abdominal tenderness—and perhaps even some "guarding" may occur when the pleura is involved.

Measles.—Some cases start with vomiting, diarrhoea, and pyrexia.

Urinary Infection.—The child's genitalia should be examined and a drop of the urine should be seen under the microscope, to exclude the presence of pus cells. This is especially important when a febrile child is found to be shivering.

Intra-abdominal inflammation and intestinal obstruction—for instance, appendicitis, peritonitis (usually streptococcal or pneumococcal), intussusception, volvulus, etc. In this group occur the most serious diagnostic errors, but in the space available I cannot do more than make brief comments upon them. Emphasis must be placed upon the need for a detailed history and accuracy in abdominal and rectal examination. Appendicitis is fairly common at all ages, except perhaps in the first year of life, and in childhood the localizing signs are often less distinctive than in the adult. It is essential that abdominal examination should be carried out with great care and gentleness, and as soon as possible after the onset of symptoms. When this is done the significance of localized tenderness in the right iliac fossa or under the lower edge of the liver is great, and there may be some reflex spasm of the overlying abdominal muscles; but these signs may disappear again within a few hours, especially when generalized peritonitis develops.

Pneumococcal peritonitis causes fever, vomiting, abdominal pain (generalized, but especially in the lower half of the abdomen), diarrhoea, and sometimes a vaginal discharge of a yellow or greenish-yellow colour. The child's general appearance may suggest a pulmonary rather than an abdominal infection, and there may be herpes labialis. Intussusception causes intermittent attacks of colic, at first lasting only a few minutes and waking the child from sleep. Careful abdominal palpation between the bouts of colic will usually reveal the tumour. At first the motions are normal, and then a little blood-stained mucus may be seen. Henoch's purpura presents a very similar clinical picture,

except that there is no abdominal tumour and petechiae may be found on the skin. Intestinal obstruction complicating hernia is less common in children than in adults; it is unlikely to be missed if a thorough examination is made, including inspection of the hernial orifices.

"*Acidosis*."—This term, though unsatisfactory as a diagnosis, calls attention to a clinical syndrome of some importance. A highly strung child, usually with parents of a similar constitutional type, is seized with severe and repeated vomiting. Even drinks of water may be returned, and the child becomes pale, distressed, and restless; there is oliguria and constipation, and a dangerous metabolic upset develops rapidly. Many different causes may bring on an attack—eating too many chocolates, a head-cold or tonsillitis, excitement, or a nervous shock, and it is obvious that the clinical picture is dependent mainly upon the constitutional make-up of the patient.

Chronic Indigestion

Though the clinical picture of subacute or chronic indigestion comprises a rich variety of symptoms and signs, the cases may be usefully divided into two main types. The first, often associated with excessive or unwise dieting, includes children that are well-built—frequently oversized—and with some of the following complaints: coated or "geographical" tongue, offensive breath, a sallow, muddy, pale, or pasty complexion with dark lines (described by the mothers as blue or black) under the eyes, hiccup, flatulence, epigastric discomfort, frontal headaches, and an appetite that may be excessive or impaired. The second type is illustrated by the thin, lanky child with flabby flesh, faulty posture, rather bluish and cold hands and feet, laxity of ligaments, and in general an appearance that makes his mother comment that he is going thin and looks very weedy, especially when he is with other children of the same age. Usually his appetite is said to be very small, but in other respects his symptoms may include any combination of those noted in the first type.

More detailed analysis of the symptomatology shows how wide may be the variations from case to case. In some, the abdominal discomfort is trivial; in others there may be severe pain in any part of the abdomen, and the child may cry, double-up, and become pale. These pains are usually of short duration, but they recur and may be excited by taking food. Sometimes they are accompanied by a desire to defaecate, but this does not always relieve the pain. The abdomen is often distended, especially when the child is thin and has flabby muscles; the distension is gaseous. The motions vary in character—sometimes normal, sometimes constipated, and often of a pale, grey, and greasy appearance for several days in succession. It is at these times that the abdominal discomfort and distension are likely to be most troublesome. In some of the more highly strung children with indigestion the motions may be mucoid, "like jelly," and either white or almost translucent. In these cases the descending colon may be spastic. Often there are curious changes of behaviour; the child is abnormally restless and active, but tires quickly and becomes apathetic. Many are said to behave as if they are unhappy; they become irritable, quick-tempered, moody, and may be rude to adults. At night their sleep is disturbed, they are restless, grind their teeth, dream about frightening experiences, and have night-terrors. When they wake up in the morning their sleep does not seem to have done them good. Some—and especially those that have been given food late in the evening—wake after about an hour of sleep and scream with abdominal pain. A cough of "habit spasm" type is quite common; migraine and vertigo are less frequent. Pains in the limbs are sometimes troublesome, and may arouse suspicions of rheumatic infection, especially when there is a low-grade fever.

It will be appreciated that in childhood chronic indigestion is more likely to show itself by general ill-health than by well-defined symptoms and signs pointing to an alimentary disorder. Hence, in the differential diagnosis, infec-

tions such as tuberculosis, rheumatic disease, and intestinal parasites must be included; and in some cases the coeliac syndrome (including fibrocystic disease in the pancreas), megacolon, intestinal malformation, recurrent intussusception, peptic ulceration, and Krohn's disease may require consideration, perhaps with the aid of radiography, and examination of the blood and faeces. Usually, however, it is reasonable to order treatment and to postpone further clinical investigation until its effect is observed.

Treatment

The treatment to be recommended for a child suffering with subacute or chronic indigestion is largely a question of common sense; but it must also take account of the possible influence of those factors, such as constitutional type, whose assessment formed the third stage in investigating the patient (see p. 197). Some children are born with a sub-normal capacity for digesting their food, especially fats, and any attempt made to fatten them up by giving cream, eggs, and extra butter is likely to cause indigestion, and especially when the child's appetite is not as hearty as the mother would wish. There is an obvious tendency in these cases for the child to be offered an unusually varied diet, the mother searching for any kind of food that the child likes and can take without ill-effects; and soon the child is virtually in charge of his own diet. The position should be carefully explained to the parents, and it is best to recommend rather small helpings of as normal a diet as the child can take, provided that the fat content (butter, cream, egg yolk, meat fat, etc.) is kept rather low. As a result, the child's appetite increases, he makes better use of the food taken ("Now good digestion wait on appetite"), and he will gradually learn to digest his food more satisfactorily. To encourage this there should be a very gradual increase of the amount of fat and other ingredients offered to him, and by this means the patient can usually be saved from becoming a food faddist in adult life.

Dietetic faults account for many cases of indigestion in childhood, and they concern feeding habits (the technique of feeding) as well as the food itself. The history must be taken in considerable detail, and it is best to make a complete record of all solids and liquids taken during an average period of 24 hours, and to ask whether the child feeds in company with other children and whether persuasion is used. One of the commonest stories is that the child "eats nothing"; and there is no doubt that some of these children have developed "negativism" towards feeding as a reaction to the mother's attitude at meal-times, and they may, in fact, take less food than is desirable. On the other hand, a detailed history often shows that the mother is mistaken and the child is taking more nourishment than he needs, usually as extra milk, cream, and butter, and perhaps with cocoa at bedtime. Useful rules are to forbid foods (which include milk, biscuits, and cake) between meals; to offer a relatively small first helping, with a second helping if the child asks for it; and to have the child take his food in company with other children if this can be arranged. Many of these patients make better progress when they are taking their meals at school than at home, because they are not bothered by attempts at persuasion and they imitate the feeding habits of the other children. It is often difficult to convince the conscientious, over-anxious parents of an only child that they would get better results—and much happier results—both for themselves and the child if they were to allow their child to become hungry. It is indeed sad that some children are denied the pleasure of having hunger to satisfy, and are at the same time condemned to indigestion, hunger being the normal initiator of the digestive processes.

The dyspeptic children of educated parents suffer more often from excess of fat than excess of carbohydrate; but the child that is eating large quantities of bread, cakes, pastry, sweets, and potatoes is undoubtedly liable to indigestion with gaseous distension of the abdomen. Food that is eaten too quickly and is not masticated thoroughly

may cause trouble, and parents should see that their children pay regular visits to the dental surgeon and clean their teeth properly. In childhood general hygiene seems to play a more important part in relationship to digestion than it does in adult life; hence such questions as sleep and rest, exercise, sunshine and fresh air, cleanliness of the body, and the maintenance of reasonable discipline all need consideration in the treatment of chronic indigestion. Similarly general ill-health—for instance, anaemia and sub-acute respiratory infections—impair digestion and should receive appropriate treatment.

Finally, nervous instability and indigestion are intimately related in childhood. Parents who worry unnecessarily, or disagree about the management of the child, create a fretful environment; and there are many other circumstances, including infidelity between parents, or death of one of the parents, that disturb the atmosphere of security found in a normal, happy home-life, and upset a child's nervous system and his digestion. These cases are perhaps the most difficult to treat effectively, requiring tactful and sympathetic understanding.

Medicines play a secondary part in the treatment of chronic indigestion, but they have their uses. A rhubarb and soda mixture is often helpful; and the pale child with a poor appetite and coated tongue will usually be helped by a mixture containing 5 to 10 minims (0.3 to 0.6 ml.) of dilute hydrochloric acid, and 10 to 15 minims (0.6 to 0.9 ml.) of glycerin of pepsin (*B.P.C.*), taken thrice daily immediately after food. Medicinal charcoal is useful when there is gaseous distension of the abdomen; and the passage of pale motions is an indication for 5 gr. (0.32 g.) doses of pancreatinum (*B.P.*), given with 10 gr. (0.64 g.) of sodium bicarbonate two hours after food. Pancreatin granules (enteric coated) can be obtained, and are palatable to children.

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THE MEDICAL RESEARCH COUNCIL'S REPORT FOR 1951-2

This year clinical research is the subject for the introductory essay in the Medical Research Council's annual report.* The choice is timely. Plans for developing clinical research within the framework of the Health Service were published last week as a White Paper (*Journal*, July 18, pp. 140 and 147), and there have been signs elsewhere, notably from the College of General Practitioners, that the profession as a whole is becoming more research-minded in its approach to clinical problems. The Medical Research Council speaks with authority on this subject. It is therefore particularly interesting to learn that, although the first research unit to be set up by the Council after the first world war was a clinical one—the Department of Clinical Research at University College Hospital Medical School—the promotion of clinical research at that time is now thought to have been premature. True, the department proved outstandingly successful, both in the work emanating from it and, but even more, as a school for clinical investigators. This was owing to the genius of the unit's director, the late Sir Thomas Lewis, a man in advance of his age. For the most part clinical problems defied investigation—as

**Report of Medical Research Council for the Year 1951-2.* Cmd. 8876, H.M.S.O. Price 6s. 6d. net.

distinct from observation—because the necessary chemical and instrumental methods were lacking. Medical research was therefore concentrated on the pre-clinical subjects where appropriate techniques were available. By the middle 1930's, however, Lewis's pupils were filling university chairs of clinical medicine and taking up research appointments; at the same time new techniques of investigation were being elaborated. The stage was set for bringing the scientific method to the bedside. By 1939 the Medical Research Council had three clinical research units: by 1948 there were 18. In 1948, also, the National Health Service began, and virtually all clinical facilities passed to the Health Departments. The time had clearly come to review the administrative arrangements for clinical research, particularly those concerning access to patients, and to define the fields of the Health Departments and the Council. Against this background discussions began between the Standing Medical Advisory Committee of the Ministry of Health and the Medical Research Council which have culminated in the issue of the White Paper.

Review of Research

In its last two annual reports the Council has selected a few branches of research for extended review; the rest of the Council's work is given in summary fashion. This practice is helpful, as it allows for the presentation of a new advance in historical perspective and often makes it possible to forecast its future; but it has the disadvantage that the picture of the Council's work is necessarily only fragmentary. This year 11 subjects are reviewed in the report: chromatography, mental deficiency, preventive medicine in obstetrics, nervous control of glandular function, food-poisoning, drug resistance, haemophilia, diseases of the ear, the thyroid gland, poliomyelitis, and the physiology of the erythrocyte. In all these fields there have been interesting, and sometimes spectacular, advances: it is possible to describe only a few of them here.

While in the last 20 years the maternal mortality has been quartered, stillbirths and neonatal deaths have shown no comparable decline. In Aberdeen socio-medical studies are defining some of the causes of this wastage. It is known that those stillbirths which occur without warning and for no obvious reason are generally due to asphyxia. Now it has been shown that they are associated with post-maturity, and further that the post-mature infant has an abnormally low blood-oxygen level; a low foetal blood-oxygen is also found in some other pathological states of pregnancy.

New ideas on the training of high-grade mental defectives have been developed. Until quite recently it was the practice to teach them skilled or semi-skilled trades such as carpentry and boot-repairing; but it was found in a group investigated that not one was able to support himself outside hospital in the trade he had been taught. The answer is to train them for unskilled work. This has had remarkable results: boys who had previously been idle were able to go out on licence to work in neighbouring factories and on building sites, with benefit to themselves as well as to the community. In 1951 patients on daily licence from the colony where these experiments were done earned £30,000, of which over half was returned to the Treasury for their board and lodging. There are 20,000 feeble-minded patients of working age in hospitals in Britain, and the importance of this work is obvious.

Clinical advances have included the recognition of a new form of bacterial food-poisoning, the development of methods for testing the hearing of very young children, and the separation of "Christmas disease" (*Journal*, December 27, 1952, p. 1378) from true haemophilia.

Knowledge of the causes of food-poisoning has advanced far since the days when ptomaines were blamed; now all are familiar with the cases caused by salmonella organisms, staphylococcal toxin, and, less commonly, unusual proliferation of bacterial types not ordinarily pathogenic to man,

*Svenska Läkartidningen, May 8, 1953.

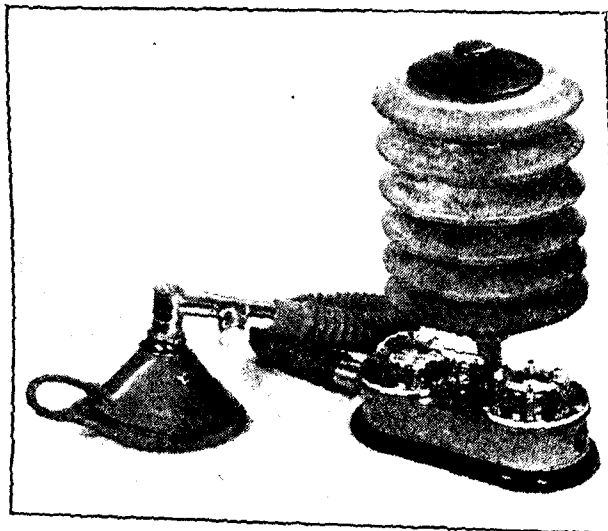
theatres was approved of, but students should be cautious in their dealings with the other sex lest they fall into the hands of the barbers and suffer from "salivation"—a reference to mercurial treatment. In Roberg's time there were as many as fifteen royal grants available for poor medical students, but as there were never as many as fifteen medical students under Roberg at the same time it is pretty safe to conclude that these grants were not over-generous. Even after qualifying as doctors Roberg's pupils encountered many difficulties, including the competition of foreign doctors. Of these Roberg wrote: "The country is flooded by 'agyrtas circumforaneos' to be branded as contraband goods." He was also critical of "perigrinerande medicinae candidater" who returned home primed with knowledge picked up at Halle, Leyden, Oxford, Rheims, and other famous university towns.

CLAUDE LILLINGSTON.

Preparations and Appliances

OXFORD INFLATING BELLOWS

Professor R. R. MACINTOSH, Nuffield Professor of Anaesthetics, University of Oxford, writes: A hundred and fifty years ago the domestic bellows were commonly used for artificial respiration. It was unfortunate if the bellows were fouled with cinder grit,¹ but a more cogent objection to this method of inflating the lungs was that it often was not available at all for the riverside emergency, so it was replaced



by manual methods (Hall, Silvester, Schafer) which can be applied on the spot without the help of extraneous apparatus.

Some 12 years ago I incorporated in the Oxford ether vaporizer² a Connell concertina reservoir bag, but inserted in it a spiral spring whose function is automatically to refill the bag as soon as the patient has partially emptied it by inspiration. If artificial respiration is required the bellows prove a simple method of inflating the lungs.

A common feature of present-day anaesthesia is deliberately temporarily to depress or abolish spontaneous respiration. The bellows previously incorporated in the Oxford vaporizer are now available separately as a small hand unit to inflate the patient's lungs with air or, if required, with anaesthetic gases. An inlet stopcock is provided in case additional oxygen is required. The two valves, seen under the glass domes in the photograph, ensure unidirectional flow so that rebreathing is avoided. Pressure on the bag transfers its contents to the patient's lungs. Slightly raising the facepiece is one way of allowing expiration to take place through passive recoil of the thoracic structures. For the past three years I have used only this unit to inflate the lungs when normal respiration has been suspended during

major thoracic and abdominal surgery. It would, of course, provide equally effective artificial ventilation in paralysis from poliomyelitis or nerve gases.

I have to thank Dr. H. G. Epstein and Mr. R. Salt for advice and help in the design of the Oxford inflating bellows, which can be obtained from Messrs. Owen Mumford, 10, Norreys Avenue, Oxford, or from Messrs. Medical and Industrial Equipment, Ltd., 12, New Cavendish Street, London, W.1.

REFERENCES

- ¹ Chausseier, F., *Hist. Soc. roy. Méd., Paris*, 1785, p. 348.
- ² *Surgery of Modern Warfare*, edited by Hamilton Bailey, 2nd ed., 2, 230. Livingstone, Edinburgh, 1942.

CARDIFF INFLATING VALVE

Dr. WILLIAM W. MUSHIN, Director, Department of Anaesthetics, Cardiff, writes: Recent epidemics of poliomyelitis, notably the one in Copenhagen last year, have shown the need for an efficient means of maintaining artificial respiration for periods of time varying from hours to weeks in patients with respiratory and bulbar paralysis. The Oxford inflating bellows (Fig. 1) are an efficient, simple, and com-

CARDIFF VALVE

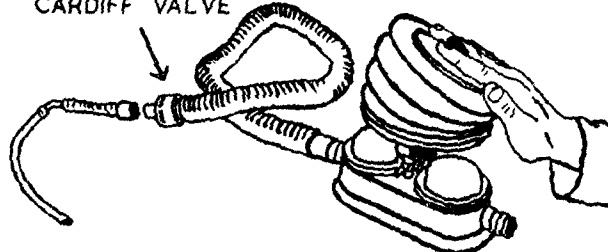


Fig. 1.—Complete assembly showing position of the Cardiff inflating valve close to the endotracheal tube or face-mask.

paratively cheap means of doing this. However, before the can be connected to, say, an endotracheal tube, some interposed device is required which will ensure that the patient's lungs empty quickly and freely to the outer air at the end of each inflation. The valve illustrated in Figs. 2 and 3 is designed to do this. When the inflating bellows are compressed the Tufnol piston (A) and its valve move a short distance towards the patient, blocking the expiratory slots (B). When the shoulder (C) of the valve reaches the end plate, the piston continues its travel, opening the ports (D). The patient's lungs are then inflated easily. As soon as the end of the inspiratory cycle is reached, the pressure within the chest and the light spring (E) move the piston in the reverse direction (Fig. 3), so uncovering the expiratory apertures. The patient's lungs empty easily to the outer air. Artificial respiration can by this means be carried out with air, and the expense and trouble of using soda lime and absorbers are avoided. Comparatively little skill is needed to ventilate the patient's lungs and little can go wrong with the whole apparatus.

The design and development of this valve is the work of Dr. W. W. Mapleson and Mr. E. K. Hillard, both of this department. It has worked well in the laboratory, and in the operating-theatre on apnoeic patients. The working of the valve is unaffected by moisture inside it. It can be obtained from the makers of the Oxford inflating bellows.

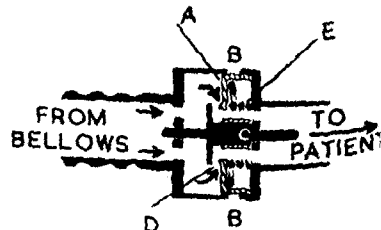


Fig. 2.—Valve during inflation.

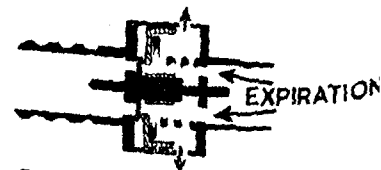


Fig. 3.—Valve during deflation and when not in use.

British Medical Association ANNUAL MEETING, CARDIFF, 1953 SUMMARY OF PROCEEDINGS

FIRST PLENARY SESSION: CORONARY DISEASE

Tuesday, July 14

Three Plenary Sessions were held during the Cardiff meeting. The first, over which Professor H. SCARBOROUGH, of Cardiff, presided, was on "Coronary Disease," and about 350 members were present to hear a most interesting series of papers.

Introduction

Dr. D. EVAN BEDFORD (London), in introducing the subject, said that the most frequent form of coronary disease was coronary atherosclerosis and its consequences—namely, the various forms of ischaemic heart disease. Minor coronary occlusions might be quite silent or, in particular areas, might cause disturbance of rhythm. The more serious occlusions caused cardiac pain, cardiac infarction, congestive failure, and sometimes sudden death.

The terminology was becoming somewhat confused. Angina pectoris and cardiac pain were terms which related to clinical symptoms; cardiac ischaemia and coronary insufficiency related to the physiology of the pain; while coronary occlusion and cardiac infarction related to the pathological anatomy of coronary disease. The diagnosis of acute infarction should be restricted to cases with evidence of cardiac injury; severe or prolonged anginal attacks without such evidence should be attributed to protracted cardiac ischaemia or coronary insufficiency.

Fifty years ago coronary disease was rarely mentioned, but to-day everyone recognized it as one of the main causes of heart failure in adults. This suggested either that coronary disease was increasing by leaps and bounds or that it had been overlooked in the past. He had no doubt that it had been overlooked. Undue attention was paid in the early days to the fatal forms and very little attention to the milder. Nevertheless it was probable that coronary disease was actually increasing. Once recognized, coronary thrombosis reached almost "epidemic" proportions in a few years. He did not believe that any comparison of prevalence to-day as compared with, say, 1918 was valid.

The causation of coronary disease urgently demanded attention. The stress and strain of life was readily blamed. The disease was being correlated with abnormal cholesterol metabolism and with endocrine factors. The established fact that the coronary arteries of women were less liable to disease than those of men, at least up to middle life, needed investigation. This suggested that oestrogens might explain the relative immunity of women to coronary disease prior to the menopause. The whole question of prevention demanded recognition in the pre-occlusive stages of atheroma. It might be that the detection of metabolic errors would achieve this where clinical tests had failed. With regard to treatment, the main advances had been in the introduction of anticoagulant therapy and improved methods of treating severe shock complicating cardiac infarction. It was still not finally decided whether anticoagulants should be used in all cases or only in selected ones.

Incidence, Mortality, and Morbidity

Dr. WILLIAM PHILLIPS (Cardiff) said that it was the experience of them all that there was an enormous variation in survival figures. His own experience included two people whose original attack of myocardial infarction dated 35 years before their death. Family history was not necessarily ominous. In myocardial infarction optimism was reasonable once the urgent phase of infarction was past. In presenting certain statistics Dr. Phillips said that their object was to give a clue to aetiology and prevention.

The first account of angina appeared in the *Medical Transactions* of the Royal College of Physicians in 1758 under the name of William Heberden. Between 1748 and 1782 Heberden saw 100 cases, and it was of some interest to reflect that for 150 or more years afterwards no one collected anything like that number. The speaker showed a graph indicating the expectation of life from early times (500 B.C.) to the present, and pointed out that only comparatively recently did this expectation rise much above 35 years from birth. The increase would appear to show that in earlier times people who survived to old age were exceptional, but this was by no means true. People in positions of responsibility in former times lived to ages which to-day would be regarded as old. Heberden himself lived to be 90. George Washington died at 67, but his half-dozen immediate successors in the Presidency of the U.S.A. lived to well over 70. In ancient Greece apparently the expectation of life at birth was under 20, in ancient Rome little more, and in the Europe of the Middle Ages down to the French Revolution it was about 35. By 1900 the figure had increased to nearly 50 and was now 65 or more. According to the Registrar-General's statistics for England and Wales in 1947 the number of deaths attributed to heart disease was 28% of the total, the next most common cause being cancer (15%). Certification of death in the elderly was probably not very accurate. Certainly in patients referred for consultation, whether in hospital or in private practice, one had the impression that the label of coronary artery disease was often applied incorrectly, and many patients with such disease diagnosable now by reasonably reliable methods were thought to be suffering from other conditions causing chest or upper abdominal pain or from rheumatism. It was too soon to employ statistical approaches to this subject in view of the possible fallacy in the material.

Pathological Physiology

Professor G. W. PICKERING (London) said that coronary arteries had only one function, the transport of blood, and only one abnormality of function, the transport of too little blood. Most of the knowledge about coronary occlusion came from experiments on animals, and these had shown that the diameter of the coronary arteries was influenced by the autonomic nerves. The most important factors were the effect of arterial pressure on coronary flow and the influence of muscular work, which also increased coronary flow, and which presumably depended on the effect of metabolites. One of the peculiarities about coronary flow was that the oxygen tension appeared to be a good deal lower than in other parts of the body.

The pain of angina pectoris was believed to occur through the same kind of mechanism as the pain of intermittent claudication, which was much easier to study, and this had been shown to be due to the accumulation in the tissue spaces of substances released from the muscle and normally removed by the circulation. The explanation of coronary arterial spasm was to his mind quite unnecessary and most unlikely. The difficulty was, of course, that in these conditions the work of the heart and the coronary flow could not be measured, but in paroxysmal tachycardia it was reasonable to suppose that the rate of metabolism of the heart was increased. In severe anaemia both angina pectoris and intermittent claudication could occur and both were abolished or diminished by relief of the anaemia. In aortic regurgitation pain occurred in association with paroxysmal rises in arterial pressure.

Coronary occlusion might be followed by one of three things: (1) nothing untoward at all; (2) angina of effort; and (3) myocardial infarction. Whether or not the individual perished when the coronary artery was occluded depended to some extent on the degree of narrowing and on the size of the collateral vessels. In coronary occlusion, therefore, there were two separate events—namely, thrombosis closing the artery, and the pre-existing arterial conditions out of which it developed. The underlying disease

was atheroma, which was most probably a disturbance in cholesterol metabolism. There was no doubt about the correlation of atheroma and obesity. The present evidence showed that atheroma was due to a disturbance in the lipid metabolism, but it was not known to what extent it was a preventable disease in man. Monkeying with diet was not without its dangers. There should be properly controlled clinical trial of the low-fat diet before patients were deprived of one of the reasons for remaining alive—the pleasures of the table.

Pain in the Chest

Dr. CLIFFORD G. PARSONS (Birmingham) said that most patients with coronary heart disease sought medical advice because they had pain in the chest, but pain in the chest did not necessarily indicate such disease, and the correct interpretation of this one symptom might be of great importance. The pain of angina pectoris was felt behind the sternum. It might or might not radiate to the neck, one or both arms, or the upper abdomen. It was an aching, restricting, or burning pain, provoked by exercise or emotional stress, and varying from one day to the next. The pain mounted rapidly to its peak, continued unrelieved until the patient was able to rest or regain equanimity, and then disappeared quietly in a few minutes. From time to time this familiar picture was modified so profoundly that it was almost impossible to recognize that the pain was angina, but one characteristic always remained—namely, the association of the pain with effort or with something that increased the burden on the heart. Sometimes the pain might be confined to an elbow or the jaw or neck. More commonly there was upper abdominal discomfort. The correct evaluation of dyspeptic symptoms was not always easy.

The newspapers had made the public fully aware of coronary artery disease, and chest pain frequently aroused anxiety about the heart. Emotional stress of any kind made the individual heart-conscious. In women angina was rare before the menopause and was then almost invariably evidence of heart disease or hypertension or well-marked anaemia.

Mild cardiac infarction caused pain which was usually more severe, more widely spread, and longer lasting than that of coronary insufficiency, and nitrites did not affect it. Vomiting and shock were common. The diagnosis could be substantiated by demonstrating signs of myocardial damage and tissue necrosis. Electrocardiographic changes were nearly always present.

Treatment of the Patient in Hospital

Dr. A. RAE GILCHRIST (Edinburgh) said that the three pain-producing syndromes of coronary sclerosis—namely, angina pectoris, coronary insufficiency, and acute myocardial infarction—overlapped and might on occasion be difficult to distinguish, yet the methods employed in their treatment could be sharply defined. The patient suffering from angina pectoris seldom required hospital treatment. In the patient with coronary insufficiency, if nitrites did not control the recurrent attacks, then other drugs such as khellin, papaverine, and phenobarbitone might provide some protection. Cervical sympathectomy should be considered for the more resistant cases of angina decubitus. Acute myocardial infarction varied so greatly in severity at the onset that the subsequent course was difficult to predict, and there was no alternative but to treat all hospital patients on the assumption that serious complications would occur. For this purpose anticoagulants were the most effective remedy so far known. As soon as the diagnosis was established the patient should be given morphine and from 10,000 to 15,000 units of heparin, preferably intravenously. He had found "dindevan" given by mouth a safe and effective anticoagulant, though laboratory control was still needed; 200 mg. a day gave a very steady prothrombin-time level. Shock was more readily handled under hospital than home conditions, and he had found digoxin useful in its treatment. It was generally wiser to send the patient at once to hospital than to move him

some days later when his condition might be more precarious. Ambulances should be equipped with oxygen and staffed by first-aid men trained in its administration. Complete immobility in bed should be discouraged as soon as shock and fever had abated. Chair-rest by the bedside might be started within two or three weeks. Usually the patient with an infarction was kept in bed for six weeks and very gradually returned to duties. At the same time prolonged rest favoured thrombosis and rest might be over-emphasized.

Treatment in General Practice

Dr. J. H. HUNT (London) dealt with the contribution which the family doctor could make to the treatment of coronary disease. In an emergency such as an attack of coronary thrombosis the very sight of the doctor helped, and the sooner the doctor could see the patient the more confidence the doctor was able to impart. Emergency calls of this sort were really emergencies in nearly every case. The doctor would probably find on arrival that the relatives had already given the patient brandy; sweet tea was perhaps better, but alcohol did give confidence. It was of the greatest importance to relieve the patient's anxiety and the assumption that he was going to get better must be conveyed to him as soon as possible.

Should the patient with coronary thrombosis be treated at home or at hospital? Much depended upon the doctor's personal assessment of matters administrative rather than medical. The speaker had seen many an old person made anxious, confused, or depressed by being moved away from his customary surroundings. One question commonly asked was about smoking. Not long ago he had a patient, a sea captain, who smoked 50 cigarettes on the bridge on ordinary days and 80 when there was a fog, but he was a strong-minded man and after an attack of coronary thrombosis he gave up smoking entirely. With many patients, however, this was more difficult, and sometimes enforced abstinence from tobacco led to an undesirable increase in appetite, and the consumption of large quantities of sweets. It was hard to believe that smoking in moderation always made coronary disease worse.

As for anticoagulant therapy, it was impossible more often than not to give this as a routine in the patient's home because of the difficulty in having control tests performed, but he desired to see short-term anticoagulant therapy more used by the general practitioner. By no means all cardiologists agreed on the necessity for anticoagulant therapy, and when experts disagreed it was for the general practitioner to judge for himself.

Twenty years ago a diagnosis of coronary thrombosis was regarded as a death sentence. Nowadays it was by no means so sinister, especially when it occurred in middle age. He had one patient who had had mild attacks of cardiac infarction at 55, 62, and 75 years of age, and died at 82 from something quite different, 27 years after the first attack. The family doctor must be ready to assume some responsibility whatever the future held for his patient, and in coronary disease no one could foretell the future. But the taking of responsibility was the fascination of general practice and the pride of the practitioner.

Questions

Very little time was left for questions from the large audience. Asked whether a considerable proportion of patients who died from coronary disease generally showed only a narrowing of the coronary artery, Dr. PICKERING said that he understood from his pathological colleagues that the examination of the coronary artery was extremely difficult, but he thought such a circumstance was uncommon.

Dr. PARSONS was asked about the exercise tests with electrocardiography. He said that very often these tests were carried out by the technician, but they were useful when supervised by the doctor. One other limitation was that they did not always work. He had a colleague who had had three attacks of mild cardiac infarction and the other

day tried to do the exercise test by running up the stairs of the three-storied hospital, but there was still no effect on the electrocardiograph.

Dr. EVAN BEDFORD, in reply to another question, spoke of the great variability of the results with the electrocardiograph. He was asked whether the electrocardiograph was infallible in the diagnosis of coronary thrombosis, and replied that he could only give an answer which would need a great deal of qualification. The electrocardiograph could not detect coronary occlusion; it detected only the consequence in the heart muscle. But he thought it most unlikely that cardiac infarction would escape detection by a complete set of electrocardiograph leads, though the single record might not show it. On the question of hospital versus home treatment, he believed that some patients under certain conditions were better treated at home. He agreed that the newer anticoagulants were much safer than the older ones.

SECOND PLENARY SESSION: "FIBROSITIS"

Thursday, July 16

The second plenary scientific session was held in the Reardon Smith Theatre, with Mr. A. LAWRENCE ABEL in the chair. The subject of the discussion was "Fibrositis."

The Point of View of the General Practitioner

Dr. A. TALBOT ROGERS (Bromley), who put forward the point of view of the general practitioner, said that this subject was in a state of confusion and it was hoped that the present discussion would enable them to look afresh at the causation of the syndrome and at methods of attacking it in their practice. In earlier days fibrositis was regarded as a definite clinical entity, though it was true that there was no general agreement as to what constituted the condition. But to-day the very existence of the condition was doubted. The general practitioner found that this diagnosis was not available for him to fall back upon. Why was it that what was a straightforward diagnosis years ago was no longer available? The position was made more difficult in that nothing had been put in place of the diagnosis which had been taken away. As a general practitioner he had a certain liking for the term "fibrositis." Quite apart from the fact that it was an easy thing to say that a patient had got fibrositis, it was a term which did not arouse alarm and despondency in the patient, his family, or his employer. Fibrositis was a term which the patient understood; if the term "prolapsed disk" were substituted the patient would imagine that it must mean some weeks of unemployment. When it was announced that Hutton had fibrositis no one was particularly disturbed, but if it had been said that he had a prolapsed disk the search would have begun for another English captain.

Could the fibrositic syndrome be explained by any single cause? If not, what conditions entered into the differential diagnosis? On what treatment could a general practitioner wisely and safely embark? Could the general practitioner be sure of finding in this classification the complete diagnosis for all the cases of aching in the back, the neck, and the shoulders that presented themselves to him, or were there still cases not falling into any other category that might be regarded and treated as cases of fibrositis?

Symptomatology

Dr. A. H. DOUTHWAITE (London) said that it was Sir William Gowers who in 1904 first coined the term "fibrositis," and he did so on a false premise. There was no recognized pathological basis for the diagnosis, which must therefore be clinical. They must turn to the pathologist to see if he could help, but it would be found that there was no characteristic pathological change which justified this diagnosis. Pathologists were shy of the term.

Fibrositis was characterized by pain and stiffness, erratic in its occurrence, coming and going for no apparent reason.

The pain was made worse at first by movement, but if movement was persisted in it passed off, and after rest, especially rest in bed, the pain was worse. The distribution was of great importance. It was almost always confined to the back of the trunk. All the common forms of alleged fibrositis of back, neck, and shoulder girdle were in fact derived from spinal disease or strain. The supposed nodules, which must not be confused with the true inflammatory nodules of rheumatoid arthritis, were areas of muscle spasm which disappeared (1) if the nerve-root irritation was removed; (2) under the influence of curare; and (3) when the patient was subjected to heat and massage. The so-called brachial neuritis—a very bad term—was applied frequently to patients who had pain radiating from the shoulder girdle down the arm to the fingers. Such brachial neuritis was almost always due to cervical spondylosis or cervical injury.

There was a general form of fibrositis to be seen in rheumatoid arthritis, but it was quite unnecessary and even undesirable to draw special attention to this involvement of the connective tissue. The sedimentation rate in fibrositis was normal as a rule, but in old persons who developed the condition it might be raised. He had never satisfied himself that any case of fibrositis had been cured by the elimination of focal sepsis. It was inconceivable that this condition could be due to any of the common pathogenic organisms seeing that the powerful chemotherapeutic and antibiotic agents now available had failed completely to relieve the symptoms. He thought it was highly probable that they were now discussing a disease which no longer existed.

The CHAIRMAN said that even if the disease no longer existed it might be as well to continue the discussion, and he called upon Dr. Spillane to discuss the psychiatric aspects.

Psychiatric Aspects

Dr. J. P. SPILLANE (Cardiff) said that Sir Henry Cohen had recently emphasized that a complete diagnosis should tell them where the disease was, what functional disturbances were present, and how they had arisen. The label "fibrositis" had been applied indiscriminately. In fact, the reference in many textbooks to the aetiology of fibrositis bore a striking resemblance to that of pernicious anaemia before Minot and Murphy. It confirmed one's impression that this was a medically fashionable diagnosis which had supplanted visceroptosis, pleurodynia, disordered action of the heart, and others of that ilk in which no organic pathological lesion could be demonstrated.

What was overlooked was the fact that the symptoms in the majority of these cases represented but one facet of a psychoneurotic illness, or a disturbed emotional state finding expression in altered muscle tension. When they reflected that non-articular rheumatism was one of the main causes of incapacity in industry, the size of the problem became apparent. The omission of the psychosomatic approach was one reason for the prolongation of much "fibrositic" invalidism. Many examples could be quoted where fibrositis had been solely due to abnormal emotional stress. There was a type of personality particularly prone to this type of disturbance. Symptoms of soreness and stiffness might well represent the patient's feeling of being hurt by circumstances and resenting them. He felt "sore" about some things and expressed his feelings somatically. When such inward feelings became expressed in this way they were, so to speak, pushed out of mind so that the patient's attention was distracted from his problems and became absorbed in his bodily feelings. Because of this conversion of interest the patient did not volunteer—nor under questioning readily admit—that he had emotional difficulty. He might well be unaware of the relationship of such factors to his affection. The speaker contended that the psychosomatic approach would justify any time expended on it, and treatment should be directed towards the abnormal emotional stresses rather than to the obvious local symptoms.

Orthopaedic Abnormalities

Mr. J. S. BATCHELOR (London) opened with the remark that he did not believe in fibrositis. The aches and pains which were attributed to this condition were usually due to various orthopaedic abnormalities of the trunk and spinal column. These abnormalities fell into two groups—namely, strain and inflammation. A common cause of strain was defect of posture, which was responsible for many of the symptoms attributed to fibrositis. The deformities, which began in early life, became fixed and were often overlooked. Trauma, sometimes apparently trivial, but often sustained during heavy lifting, produced what was essentially an acute strain or sprain of one of the lower lumbar joints and was often followed by recurrent attacks of lumbar pain of acute onset (lumbago). The tendency to label such strains as "slipped disks" was to be deplored. Congenital anomalies in the lumbosacral region constituted a structural weakness which might lead to strain symptoms.

Into the group of inflammations fell osteoarthritis, ankylosing spondylitis, and tuberculosis. Osteoarthritis of the whole spine or one of its regions was usually due to long-standing postural defect. When localized to one spinal articulation it was often the result of an old injury followed by disk degeneration. Ankylosing spondylitis in the fully matured stage was easily recognized, but in the early stages the diagnosis might not be easy. The possibility of spinal tuberculosis should always be borne in mind.

Gynaecological Causes of Backache

Mr. LESLIE H. W. WILLIAMS (London) said that in this condition gynaecologists had a limited field. Nevertheless they had referred to them many cases of low backache which were often labelled "fibrositis." Among these cases of low backache were a number with some gynaecological abnormality. The gynaecologist's problem was to decide in these cases whether the pelvic abnormality was really the cause of the backache. His first reaction was to look for something else—muscular, articular, or ligamentous. When there was nothing obvious in this direction he tried to find out whether the gynaecological lesion could justly be incriminated. The testing was fairly simple in such conditions as prolapse, which could be temporarily supported by a ring pessary. Should this relieve the backache it was some evidence that the prolapse was responsible. In other cases such as retroversion correction of the position and the temporary fitting of a Hodge pessary was indicated.

In cases of more serious nature, such as fibroids or ovarian cysts, no one could say whether these tumours were causing the backache until the tumours were removed, but since such removal was necessary in any case the correct course was being followed when surgery was adopted. Much the same was true of cases of endometriosis and chronic salpingo-oophoritis. But a word of caution was necessary. As surgery might mean a radical pelvic clearance, and that in a young woman, palliative treatment should first be given a prolonged trial. The question whether disease of the uterine cervix did or did not cause backache was still disputed. Most types of cervical abnormality were in any case the better for active treatment, and if this happened to cure the backache all was well. But failure to remove backache by this treatment must not be regarded as unexpected or as serious.

Primary Fibrositis an Imaginary Disease

Dr. J. H. CYRIAX (London) said that fibrositis was the commonest misdiagnosis to-day. The word was coined to explain lumbago, and this view remained unchallenged until his own paper in 1945 attributing it to a disk lesion. The mere fact that lumbago fixed the patient's lumbar spine in flexion showed that the sacrospinalis muscles were not in spasm and that the fatty lobules which these muscles contained were not responsible.

Fibrositis meant pain felt by the patient in a muscle of the trunk. From what source did the pain originate? Usually from articular lesions at the spinal joints. When

these squeezed the dura mater pain of extra-segmental reference resulted and referred tenderness was prominent. This provided the misleading tenderness responsible for the concept of fibrositis.

Proof was simple if the examiner tested muscle function against resistance, tested articular function by passive movement, looked for fibrositis when the pain was absent, and moved the fibrositis about by manipulative reduction at the appropriate spinal joint. In the end many lesions got worse, root pressure resulted, and the clear neurological signs appeared which made the diagnosis of a disk lesion obvious.

If the function of the moving parts was examined in this way and logical deductions were drawn, the concept of fibrositis would be replaced by a correct diagnosis. Often this entailed manipulative reduction of the relevant spinal joint, but never heat and massage to the area of referred tenderness. Palliative treatment at an area of referred tenderness must be prevented, and manipulation by trained physiotherapists should be prescribed. Swift relief was then attained within the medical sphere instead of the credit being given to bone-setters.

Methods of Treatment

Dr. G. D. KERSLEY (Bath) said that he was not quite sure where fact ended and fiction began in a discussion on fibrositis, a term which was now described as the refuge of the diagnostically destitute. He agreed that the term was a "wastepaper basket." Many of the cases were suffering from postural defects or visceral derangements, and many others were psychosomatic. But in his opinion it was ridiculous to say this of all cases. Some academic gentlemen who denied the existence of this condition were burying their heads in the sand.

There were two types of true fibrositis. One was rheumatoid, particularly common in the elderly, and associated with a raised sedimentation rate, often loss of weight, and generalized muscular pain and stiffness. This reacted well to rest, A.C.T.H., and cortisone. The other was associated with gout.

Dr. Kersley said that he himself had had three attacks of acute myalgia in different localities during the last four years. On the last occasion he woke in the morning with severe lumbago, and arranged with a colleague to have an intravenous hypertonic saline injection early in the afternoon. Something occurred to postpone this, and in the late afternoon the pain entirely subsided. Had he had the injection, no doubt the cure would have been ascribed to it. There were several names in medicine which disguised ignorance, and he thought "fibrositis" should remain; an alternative suggestion would be P.U.O. (pain of unknown origin).

Much could be done for these patients by advice on mode of life, avoidance of occupations which entailed a group of muscles being in a state of spasm, and avoidance of severe unaccustomed exercise. Patients should be told to do a few limbering-up exercises for two minutes every morning, followed by a hot bath, and in hot weather a cold shower and a vigorous rub-down. Excessive weight should be removed by diet, and any food to which the patient was allergic should be cut out. Heat in the form of a hot bottle or electric pad might be applied, and deep heat was sometimes useful. Manipulation was of definite value—usually in between attacks, when these were frequent. "Some experts say there is no fibrositis, because of lack of scientific demonstration. I do not want to be unkind to them, but I do feel like wishing them just one attack."

Discussion

Dr. KENNETH N. LLOYD (Cardiff) said that the essential lesion was muscular tension, whether local or general. Fibrositis was a diagnosis of exclusion. Dr. W. N. LEAK (Windsford) referred to certain abdominal causes of fibrositis, and spoke particularly of chronic appendicitis as a cause of backache. Chronic appendicitis also caused a certain amount of muscle spasm and nervous tension. Dr. R. C. B. BARBOR (Hoddesdon) endorsed from his experience as a general practitioner the value of Dr. Cyriax's

methods of examination and treatment. Dr. DAVID HUGHES said that he had often suspected that patients were exaggerating their symptoms until he had an attack himself, when he discovered that the pain was very real. He obtained complete and dramatic relief by massage and manipulation. He found himself talking about the attack in exactly the same way as that in which his patients had talked. In reply to Dr. ELSIE WARREN, Dr. DOUTHWAITE said that neck, back, and shoulder ache were made worse by knitting. In reply to another question, Dr. KERSLEY said that a lot of people declared that they began to feel the benefit two or three weeks after spa treatment had ended, but he could not say that this was within his own experience.

Mr. A. STAVELEY GOUGH (Watford) spoke also as a victim who had been relieved 48 hours after a well-placed procaine injection. In some cases the condition could be explained as caused by a disk, but in some cases it could not. There was a future for general-practitioner research on this problem.

Dr. A. TALBOT ROGERS, in replying on the discussion, agreed that this was a subject for general-practitioner investigation. He hoped it would be one of the research projects of the College of General Practitioners. In his view the title "fibrositis" should not be discarded, but the name should remain within inverted commas.

THIRD PLENARY SESSION: OVERWEIGHT

Friday, July 17

Clinical Survey

The third Plenary Session, over which Lord HORDER presided, was opened with a paper by Dr. J. H. SHELDON (Wolverhampton), read in his absence owing to illness. He thought a general clinical survey might be useful, as there were numerous aspects which impressed the clinician but for which experimental medicine had not provided the answer. Appetite played the fundamental role in obesity, and here the recent discoveries of the part played by the hypothalamus in the control of appetite were of great importance. Rats, after hypothalamic damage, showed a voracious appetite, which gradually subsided to more normal levels. A clinical study of maternal obesity showed a close parallel with such experimental demonstrations. In the initial stage, again, there was a voracious appetite, but presently a "plateau" stage was reached. The gain in weight began with dramatic rapidity and then fell off, this process taking in these maternity patients about a year. One woman, in January, 1940, weighed 133 lb. (60 kg.); by April her weight had gone up to 168 lb. (76 kg.). After this she refused to face the scales until April, 1944, when her weight was 218 lb. (99 kg.)—a gain of approximately 0.4 lb. (0.18 kg.) per week over the period.

Some fat people gained their weight slowly and steadily, but others showed initial rapidity. One woman whose weight went up at the rate of rather more than 3 lb. a week took her normal meals, with second helpings, but had sweets and other eatables in the intervals, a special supper immediately before going to bed, took food to bed with her in case she starved in the night, and insisted that her husband bring her bread and cheese with the morning cup of tea, and yet she refused with some anger to say that she was overeating and stated that she never had more than her "fill." Some patients showed a progression from "I am never satisfied" to "I get hungry again within an hour." When a woman had reached the "plateau," observation showed that frequently she was not taking an excessive diet. Many fat individuals might not deserve to be fat on their present intake, but they had at some time in the past deserved to become fat and had been able to maintain their added weight on the basis of normal intake. Theoretically this could be done only on a diminution of activity, and general observation suggested that that might be the case.

There were several types of clinical obesity in which a cortical factor must be assumed. The well-known gain in weight which followed abstinence from tobacco might have a similar cause. Emotional tension might be eased by the taking of food and a disturbance of an endocrine factor might be involved. Maternal obesity began immediately after the birth of the baby. Some studies had suggested that the appearance of a male infant might affect the emotional state of the mother, resulting in an increase of appetite.

In general it was true that obesity occurred at the epochs of growth and puberty, maternity, and the menopause, all of which were accompanied by an endocrine departure from a relatively static state. It would be interesting to know more about the menopausal middle-age spread, and here was a field for clinical observation. One's general impression was that the gain in weight at this period was slow. It might be due to taking dietary risks at a time when expenditure of energy was diminishing. Women who developed diabetes in middle life were apt to have given birth to larger babies than non-diabetic women. Present knowledge could not go much further than the general statement that the adrenal cortex was undoubtedly concerned in the production of obesity. The use of cortisone and A.C.T.H.—particularly the latter—might be accompanied by an increase in weight, but the link between the adrenal cortex and the appetite was still a mystery. One could not avoid the surmise that alterations in steroid function might influence the appetite by direct effect on the hypothalamic control.

The Control of Appetite

Professor R. A. McCANCE (Cambridge) said that he must be allowed as a scientist to say a word about thermodynamics. If more potential energy than it expended were put into a living organism in the form of food the energy would be stored up inside, usually in the form of fat. The adjustment of calorie intakes to requirements was usually very exact, and people got fat because they lost control, often only temporarily, of this fine adjustment. The whole future for the control of obesity lay in finding out what were the mechanisms which controlled the appetite. Until these were known, corrections could not be applied. There must be something very fundamental about these mechanisms, because they made their appearance very low down in the scale of evolution, being exhibited by animals like hydra, with the humblest of nervous systems. In man the cortex, both at the unconscious and particularly at the conscious level, had become very important. It would probably be promising to look for the control of food intake in some change in the chemical anatomy of the nervous system, possibly in some specific cells or centres. If the responsiveness of the nerve cells or receptors was found to depend upon their chemical structure, and if these in their turn depended upon the nutritional state of the organism, it would be possible to explain all the elementary facts about the control of appetite as we now knew them. He added (though this was questioned by other speakers) that clinical obesity was never due to retention of water.

Dangers of Obesity

Dr. A. P. MEIKLEJOHN (Edinburgh) agreed that the fundamental problem of obesity lay in the appetite, though plenty of people who suffered from it would like to believe that their surplus tissue arose as a result of spontaneous generation. In every case appetite led to greater intake of food, and the body did not always get rid of it by expenditure of energy. In many cases overeating was just a bad habit. People could become addicted to food just as easily as to alcohol. Some people, particularly women, overate because they were unhappy; they were driven to the bun or the pastry for the same reason which sent their husbands to the public-house. Psychological overeating generally affected the poor much more than the rich in view of the quality of the surplus food which the poor consumed. There were, however, whole groups of patients who did

not lose weight on a low-calorie diet as fast as should be expected, and it was a common observation that many people ate prodigiously without putting on weight.

Why was obesity a menace to health? There was a time when obesity was considered normal in middle age, but experience of life assurance companies showed the other side of the picture. In some figures published by the Metropolitan Life Assurance Society it had been shown that a man (not a woman) aged 45 who was 25 lb. (11 kg.) above standard weight for that age was likely to die at 60, when he might otherwise have lived to 80. Obesity rendered its victim more prone than the normal person to a variety of ills, including accidents. At home he was more liable to trip over carpets, and at work to get entangled in machinery. There could be no doubt that obesity was the commonest nutritional disorder in Great Britain to-day, and it was the duty of the medical profession to be vigilant in its prevention and wage war against it whenever it was seen in their patients.

Estimation of Overweight

Dr. H. M. SINCLAIR (Oxford) pointed out that estimation of obesity by comparing the weight of a person with certain standards for sex, age, and height was often fallacious for various reasons. One of them obviously related to the build of the person: muscular persons might be heavier than fat persons of the same height and yet have much less body fat. The simplest way of measuring body fat was to take the thickness of a skin fold with a simple type of calliper and measure the subcutaneous tissue. This correlated highly with the density of the body. One-half of the whole fat of the body was subcutaneous. Overweight was particularly difficult to estimate in children because of the two characteristic growth spurts—at the age of 5-7 and at puberty. Over-nourishment caused early maturity, and this was an extremely bad thing, particularly in man, because the characteristic of the species was the very long time it took to reach maturity, and to speed up the process might mean early death.

The speaker gave a list of disorders which accompanied obesity. These included degenerative arthritis, hernias, atherosclerosis, hyperpiesis, diabetes mellitus, chronic nephritis, gallstones, and complications in pregnancy and childbirth. He also exhibited a table showing the influence of overweight on mortality in persons aged 45-50 years:

Overweight	Increase in Death Rate Over Average
lb. (kg.)	%
10 (4.5)	8
20 (9)	18
30 (13.5)	28
40 (18)	45
50 (22.5)	56
60 (27)	67

Treatment of Obesity

Dr. LEONARD H. HOWELLS (Cardiff) spoke on the role of the amphetamines in the treatment of obesity. In the ordinary case of obesity, he said, strict adherence to a low-calorie, restricted-fluid diet would normally result in a satisfactory loss of weight; but in many cases the use of a supportive drug was necessary, and of these the most valuable was dextro-amphetamine sulphate. It was time that this drug was put in its proper place in the therapeutic armamentarium. It encouraged the obese patient to learn new dietary habits; it promoted a sense of well-being, and it enabled the patient to carry on when he would not otherwise do so. It did not in itself bring about any loss of weight; it was supportive in its action. It was a safe drug to use for children when required. It might also be used to help the pregnant woman to lose weight. He gave the results in an unselected series of cases of obesity referred to the dietetic department of the United Cardiff Hospitals (see next column).

Dr. Howells added a few words on diabetes mellitus and obesity. Overweight people developed diabetes much more

Treatment	No. of Patients	Defaulted Attendance	Attended Regularly	Satisfactory Weight Reduction	Some Weight Lost	Failed to Lose Weight
Diet alone	156	56	100	46	27	27
Dextro-amphetamine while dieting	39	11	28	22	6	0

commonly than normal people. Among insured persons diabetes was five times more common among those with overweight. The death rate also was higher among overweight diabetics. Of 364 patients attending diabetes clinics in Cardiff, 32% of the females and 8% of the males exceeded their standard weight by more than 20%.

Female diabetics were much more liable to overweight than males. It was essential in the treatment of diabetes to bring about a reduction of weight, first, because obese diabetics died early, and, secondly, because complications were much more common in this group.

Obese Patients in General Practice

Dr. EMRYS WILLIAMS (Cardiff) said that two principal classes of patients suffering from overweight were commonly encountered in general practice. The first were the patients who were above average weight and wanted to slim because they were worried about their figure. The others were those who were suffering from definite pathological conditions either caused or affected by overweight, and these conditions included, in addition to those which other speakers had mentioned, a number of others such as skin affections. Many overweight patients showed emotional immaturity. Lack of emotional satisfaction led to overeating. Nevertheless his own impression was that obese people were on the whole agreeable companions. He gave illustrative cases from his own practice of the response to dieting. Sometimes the condition might be due to heredity or possibly psychological factors came in, and not much could be done about it. The results to be anticipated in hyperpiesis, arthritis, and dyspepsia were noted.

Dr. R. A. PALISTER (Malaya) asked whether reduction of fluid in addition to calories was necessary. On this point Dr. HOWELLS said that, contrary to the view expressed by Professor McCance, he believed there were a certain number of people in whom fluid retention did play an important part, and that reduction of fluid helped to bring about loss of weight. It was a personal point of view based on experience.

THE SECTIONS

SECTION OF MEDICINE

Wednesday, July 15

The Use and Abuse of Antibiotics

With the president, Professor A. M. KENNEDY (Cardiff) in the chair, Dr. R. W. FAIRBROTHER (Manchester) opened the discussion on the use and abuse of antibiotics. He urged close collaboration between bacteriologist and clinician in achieving the best results from antibiotic treatment. Choice of the correct antibiotic for a patient was not always easy. It was most important that the antibiotic used should be effective against the bacteria responsible for the disease. If bacteriological control was not available judgment must be based on the rapidity of clinical response. The dose of antibiotics was important, especially with penicillin. The tendency was to use doses which were too large and too infrequent. An adequate initial dose was essential, and treatment should be continued for some time after clinical improvement occurred. In spite of theoretical considerations, there was little justification for using mixtures of antibiotics in clinical practice except when dealing with mixed infections. When two antibiotics were used together their effect on infecting bacteria might be no greater than when one was given alone; sometimes the effect was

much less. The alleged synergistic effect of antibiotic mixtures probably had no practical application to clinical medicine.

The main toxic effects were due to intestinal upsets, hypersensitivity, and depression of the bone marrow. Additional dangers were the production of resistant bacteria, the risk of overwhelming secondary infections by insensitive organisms, and the masking of the true clinical picture of the disease. The indiscriminate use of antibiotics was dangerous, and laboratory control should guide their use whenever possible.

Dr. THOMAS ANDERSON (Glasgow) said that the use of any antibiotic always entailed a risk of its abuse. Although precise diagnosis was needed, clinical evidence often sufficed to incriminate certain organisms and justified the choice of an antibiotic. In local infections it was not sufficient to achieve a systemic concentration of the drug; the local site must be reached. But local applications of antibiotics were dangerous, since bacterial resistance soon appeared and skin sensitization was commoner when treatment exceeded five days. Penicillin was still by far the most widely used, and the most useful, antibiotic. Chloramphenicol, aureomycin, and terramycin should be used only when there were clear indications—for example, when dealing with a penicillin-resistant infection, in tracheo-bronchitis in childhood, or in specific infections such as enteric fever, typhus, or psittacosis. The newer antibiotics had no place in treating the common cold, influenza, or gastro-enteritis.

In assessing the correct dose, blood levels of penicillin were not as important as the sensitivity of the organism. Crystalline penicillin in aqueous solution was still the best and safest preparation to use parenterally. More use might be made of oral penicillin in doses of 200,000 units five times daily. Streptomycin was not a useful drug and should be used only in the treatment of tuberculosis and, possibly, brucellosis. It should never be used in urinary infections, because bacterial resistance rapidly developed. The risk of dihydrostreptomycin producing deafness precluded its use as a therapeutic agent.

Mr. J. S. JEFFREY (Edinburgh) said he thought that antibiotics were abused more in hospitals than in general practice. The tendency was to give too much antibiotic for too long and to neglect frequent reassessment of the clinical picture. In surgical practice it was necessary to consider not only the sensitivity of the infecting bacteria but also the blood supply to the site of infection. Surgeons often used penicillin to try to prevent secondary infections. This increased the proportion of penicillin-resistant staphylococci in hospital practice, but some resistant strains would respond to high doses. In treating minor surgical infections six-hourly injections of soluble penicillin were best. If there was no improvement another antibiotic should be substituted. Local applications of penicillin were often harmful because they produced skin sensitization and encouraged secondary invasion by non-sensitive bacteria. Aureomycin and chloramphenicol were much more effective than penicillin—applied locally. The prophylactic use of penicillin to surgical patients was justifiable because it did no harm. Streptomycin was more dangerous and should be used only in appropriate cases. Chloramphenicol, aureomycin, and terramycin should never be used in prophylaxis, since they destroyed the normal intestinal flora and so interfered with vitamin metabolism. The convenience of oral administration was no excuse for the indiscriminate use of these newer antibiotics.

Antibiotics for Pulmonary Tuberculosis

Dr. H. M. FOREMAN (Sully, Glam.) spoke on the use of antibiotics in the treatment of pulmonary tuberculosis. Streptomycin should be regarded as an adjunct to other forms of treatment. Streptomycin was of most value in treating acute forms of tuberculosis. When given alone, most patients developed resistant organisms. Streptomycin resistance could be almost eliminated by simultaneous treatment with para-aminosalicylic acid (P.A.S.). P.A.S. should never be given alone, since drug resistance soon occurred.

At least 20 g. of P.A.S. should be given daily when the daily dose of streptomycin was 1 g. Intermittent streptomycin therapy, 1 g. every three days, was probably equally as effective as continuous treatment, and it was certainly less toxic and less liable to produce drug resistance. Streptomycin sulphate was the least painful preparation when injected; dihydrostreptomycin had no advantages and was more toxic. Isoniazid had recently been introduced and was an effective agent against tuberculosis. Here again, drug resistance quickly developed if the drug was given alone. A combination of streptomycin and isoniazid had proved very effective; it had not yet been determined whether this should replace the combination of streptomycin and P.A.S. in the treatment of pulmonary tuberculosis.

Dr. KENNETH S. MACLEAN (London) considered that the therapeutic use of combinations of antibiotics, or of antibiotics with chemotherapeutic agents, should be more fully explored. Penicillin and streptomycin when used together gave the best results in bacterial endocarditis. The treatment of a series of patients with advanced excavated pulmonary tuberculosis was described. Some patients had been treated with isoniazid alone and the others with isoniazid and streptomycin. It had been found that isoniazid alone had no place in the treatment of tuberculosis. Isoniazid and streptomycin together were effective, the results of second courses of treatment being equally as good as the first. This combination offered more hope to people with chronic advanced pulmonary tuberculosis. Such treatment might be undertaken by the general practitioner.

Dr. F. A. WHITLOCK (Truro) described the use of antibiotics in dermatology. There were very few skin complaints in which antibiotics were indicated. Penicillin should never be used in a creamy preparation, since sensitization was so common. Penicillin lotions were safer, but should not be used for more than five days. Streptomycin should never be used locally. Chloramphenicol and aureomycin were much more valuable and less liable to produce skin sensitization. In most skin infections it was best to use older remedies such as ammoniated mercury or "vioform." Antibiotic therapy did not play a big part in dermatology.

In the discussion which followed Dr. V. COTTON-CORNWALL (Liverpool) emphasized the danger of tuberculous patients, while under treatment with antibiotics, infecting other patients with drug-resistant organisms. He thought that the treatment of tuberculosis in general practice would enhance this danger. Dr. T. A. BLYTON (Chesterfield) made a plea for the routine use of the sulphate salt of streptomycin and warned against mixing different streptomycin preparations, which might prove to be incompatible.

INTRATHORACIC NEW GROWTHS

The meeting of the Section continued in the afternoon with the president, Professor A. M. KENNEDY (Cardiff), in the chair. Dr. A. BRIAN TAYLOR (Birmingham) opened a discussion on the early diagnosis of intrathoracic new growths. The death rate from this disease was increasing, he said. Although this might partly be explained by more accurate diagnosis, it was probable that there was an actual increase in the incidence of the disease. Successful treatment depended on early diagnosis, but even so surgical treatment was not entirely satisfactory. With early diagnosis more patients were found to be suitable for operation at the time of diagnosis, and more patients were cured by successful surgery. Radiography was the most important investigation in early diagnosis, and whenever possible radiological facilities should be made available to the general practitioner. When an abnormality was discovered in chest radiography it was vital not to temporize but to pursue fuller investigation. Bronchoscopy should be done in all doubtful cases. It had been possible to see 82% of bronchial neoplasms on bronchoscopy, although biopsy confirmation was available in only 57%. Examination of the sputum for malignant cells was not a reliable test, and negative results were of no value in diagnosis.

In deciding on which patient should be suspected of having bronchial carcinoma and fully investigated, the general practi-

tioner should bear in mind certain facts about the disease. Bronchial carcinoma occurred most commonly in men between the ages of 50 and 60; it was commoner in town dwellers than in country dwellers. The four common early symptoms were cough, pain, dyspnoea, and haemoptysis. Haemoptysis always necessitated full investigation. It was depressing to recall that in more than one-fifth of the patients the presenting symptom indicated that the disease was already inoperable.

Mr. VERNON C. THOMPSON (London) said that carcinoma of the lung was now the commonest cancer in the male and caused more deaths than did tuberculosis. The problem was not entirely one of early diagnosis, but for the patient this was vital, because surgery offered the only chance of cure. Even when delay in diagnosis was minimized many growths were not curable by surgery. Probably there was a long latent period between the evolution of bronchial carcinomata and the production of symptoms. During this period there were no symptoms, signs, or radiological changes. From the surgeon's point of view it was important that diagnosis should be made before the growth had spread outside the lung, for once spread had taken place the post-operative survival rate fell from 60% to 15%. Early diagnosis depended on full investigation following rapidly in any patient in whom the disease was suspected. Unfortunately there was still a delay of about six months between the appearance of the first symptom and confirmation of the diagnosis. Delay was often caused by the patient's failure to seek medical advice, or by the doctor's hesitation in referring cases to special centres.

The family doctor should suspect bronchial carcinoma when cough persisted in a patient over 40 years of age. The most important physical sign was a persistent localized rhonchus. Pain, dyspnoea, and haemoptysis all deserved full investigation, as did some of the rarer manifestations, such as polyarthritis and clubbing of the fingers. The general health of the patient was a poor guide to diagnosis. Mass radiography offered the only hope of diagnosis in the symptomless phase. Sputum examination for malignant cells was invaluable in expert hands. The most difficult cases were those with a peripheral radiological shadow but no other positive findings.

The Pre-symptomatic Period

Dr. PETER J. KERLEY (London) said that after symptoms occurred in bronchial carcinoma the prognosis was bad, and emphasized the importance of diagnosis in the pre-symptomatic period. He had known of many patients in whom radiological changes had been present for many years before symptoms occurred. It was probable that the life history of bronchial carcinoma was longer than had been thought. The two most important radiological changes in the pre-symptomatic phase were slight unilateral hilar enlargement and small rounded peripheral opacities. Hilar enlargement was often difficult to gauge, but could be demonstrated clearly by tomography. Peripheral rounded foci owed their round shape to the abundant vascular supply. Round shadows in the lung could also be caused by tuberculosis, developmental tumours, cysts, and dissociated lung segments. It was usually possible to differentiate peripheral carcinomas, because they grew more slowly, contained no areas of calcification, tended to have striated outer borders, and occurred in any part of the lung field. In contrast, tuberculosis occurred almost entirely in the apex of the upper and lower lobes and hardly ever in the anterior half of the lung. Angiography had not helped in differentiating peripheral shadows, but it was hoped that radioactive isotopes would give much help in the future.

Mr. DILLWYN M. E. THOMAS (Cardiff) thought the best way to appreciate the problems in diagnosis of bronchial carcinoma was to approach them from the viewpoint of the general practitioner. He had analysed a hundred cases referred from general practitioners because bronchial carcinoma had been suspected. Dramatic or sudden onset of symptoms was not very common, although pneumonia or

haemoptysis sometimes attracted urgent attention. In South Wales carcinoma of the bronchus was hardly ever found in women. The onset was usually insidious and was often masked because previous respiratory disorders were so common in that locality. In patients with previous bronchitis, chest pain was often the new symptom which suggested carcinoma. The clinical history was often more important than physical signs in arousing suspicion of bronchial carcinoma.

In answer to questions by Dr. E. A. DANINO (Swansea), Dr. EMILY V. SAUNDERS-JACOBS (Woolwich), and Dr. T. W. DAVIES (Swansea), Dr. A. BRIAN TAYLOR said that he did not rely on respiratory function tests before operation, because the patients were suffering from a fatal disease. Pulmonary tuberculosis was not commonly found in conjunction with bronchial carcinoma. The cough in bronchial carcinoma was often non-productive. Mr. DILLWYN M. E. THOMAS thought there was a place for respiratory function tests, especially in a locality where chronic pulmonary disease was so common.

SECTION OF SURGERY

Wednesday, July 15

Toxic Goitre

With the president, Professor LAMBERT C. ROGERS (Cardiff), in the chair, Mr. ROBERT V. COOKE (Bristol) opened a discussion on the treatment of toxic goitre. He felt bound to confess that he had spent too much time operating and too little time thinking about the all-important question of the cause of thyrotoxicosis. A brief review of the physiology and pathology of this gland served only to emphasize our lack of knowledge about facts of fundamental importance. Until recently there had been little real advance in our knowledge for many years, but it was to be hoped that investigations with radioactive iodine would elucidate many obscure points. In the absence of much fundamental information they had set about treatment and, for want of a better method, had resorted to surgical removal for many years. Good surgery had become safe and satisfactory, but that safety had been slowly won, step by step. Most of the shortcomings of surgery were well enough known, but the speaker contended that many of the errors were avoidable. But the best surgery was essentially a crude weapon and was often an ordeal for such patients. He did not intend to discuss the treatment of the mild case.

As for medical treatment, until quite recently it had been suggested that this was largely a question of preparing the patient for a decent operation. It was no wonder that the antithyroid drugs had at first seemed an attractive alternative to operation. But after extensive trials the results had proved too unpredictable and relapses too frequent for these drugs to be considered a reason for avoiding good surgery. He did not favour the routine use of antithyroid drugs prior to operation and felt that many patients were adequately prepared with iodine. The method of tissue irradiation by means of selective absorption and accumulation of a radioactive isotope was a fascinating idea with seemingly great prospects. Despite many disappointments there could be no doubt of the value of radioactive iodine in the treatment of hyperthyroidism. The problem of assessing optimum therapeutic dose with so many variables to consider was exercising workers the world over. A glass or two of almost tasteless solution must be an attractive alternative to a surgical procedure, especially in those cases where there were no pressure effects or possibility of malignancy. Many of the problems of dosage were analogous to those which had formerly faced the surgeon in deciding how much gland should be removed. Radioactive iodine did seem to be the treatment of choice in older patients and in recurrent cases.

Mr. D. IOAN-JONES (Cardiff) said that he would like to confine himself to the more elementary aspects of this sub-

ject. He stressed in particular the importance of assessing each patient carefully and the value of sympathetic handling. In taking the history of the case it was often of real value to have the opinion of a close relative. Turning to the examination of the patient, he emphasized that a palpable gland, however thin the neck, was an abnormal gland, and that thyrotoxicosis was unrelated to the size of the goitre. He also referred to the difficulties experienced in recognizing tracheal displacement and compression and retrosternal extensions of the gland. In his experience doctors were apt to suspect malignancy unjustifiably, often in cases with hard glands. The modern tendency to prepare the patient before admission to hospital could be carried too far, and the surgeon might be tempted to be in too much of a hurry. The patient needed quiet but not an unduly restrictive atmosphere. Phenobarbitone could be used too often. He observed that it was of value to see how the patient responded to rest before deciding between iodine and thiouracil for pre-operative preparation. In conclusion he emphasized the importance of a gradual return to normal activity if the patient was to reap the maximum benefit from operation.

Mr. R. J. MCNEILL LOVE (London) pointed out the dangers of diagnosing neurasthenia and psychasthenia in cases of toxic goitre. He referred also to those cases with impalpable goitre. He endorsed some remarks of Mr. COOKE's drawing attention to the danger of damaging the recurrent nerve and said that the vocal cords should be examined both before and after operation, otherwise damage could frequently be overlooked.

Mr. P. R. HAWE (Liverpool) thought that the general practitioner must find it hard to decide whether to send his patients to a physician or a surgeon, and he thought it best that the mild cases should go to the physician. There appeared to have been some doubt about the value of the antithyroid drugs, but he felt that they were most valuable in preparing the patient for operation. Routine exposure of the recurrent nerves was important, and he himself had been in the habit of looking for the parathyroid glands, although he saw the superior glands in only about half his cases.

Mr. J. H. PIERRE (Trinidad) said that many of his patients had been treated by the general practitioner with iodine and thiouracil before admission to hospital, and in assessing whether the patient was ready for operation he had found palpation of the gland to be of some help. He asked whether the opening speakers could advise on the management of thyrotoxicosis cases at puberty and on the use of insulin in severe cases.

Mr. SOL M. COHEN (Dartford) asked whether estimations of the basal metabolic rate were thought to be of value. He referred to the possibility of liver damage in these cases and the use of high-protein diet and the vitamin-B complex. For the young patient surgery was to be preferred, but the other methods of treatment were useful in the older patients without nodular glands.

Mr. ROBERT V. COOKE, in reply, stated that he placed little reliance on the B.M.R. investigation. It had not been his practice to look for the parathyroid glands. Where a recurrent nerve had been damaged at a previous operation and the patient was unaware of it he avoided drawing attention to the condition. In pubertal cases he thought that the best method of treatment was to prepare them for operation as quickly as possible; but he was reluctant to comment on Mr. Pierre's inquiry about the use of insulin in severe cases. Doubtless it might be of value to give a high-protein diet and vitamin B, but he did not feel that his patients had suffered from omission of this therapy.

Treatment of Gall-bladder Diseases

With Mr. C. JENNINGS MARSHALL (London), vice-president, in the chair, Mr. R. J. MCNEILL LOVE (London) opened the discussion by saying that biliary disease caused more ill-health than was generally realized. He referred to those cases in which gall-stones were discovered accidentally, those

presenting with flatulent dyspepsia, and lastly those that developed various complications. He said that most cases of acute cholecystitis would settle down well without operation. Many patients with cholangitis secondary to stones were wrongly diagnosed as having "liver trouble." External fistulae were rarely seen these days, but internal fistula was not uncommon, and elderly patients sometimes presented with gall-stone ileus. Carcinoma in the gall-bladder was more common than was generally realized. Mr. Love went on to discuss the results of surgical intervention for gall-stones and some of the causes for disappointment. Referring to the relief of biliary colic, he advocated the use of pethidine rather than morphine. He next summarized some of the points of operative technique, and first drew attention to the liability of pulmonary embolism. For this reason he was very particular about supporting the heels on a special pad to prevent pressure on the calf veins. The value of cholangiography on the operating table was emphasized, and he showed a number of x-ray films of such cases. It was his invariable practice to do this simple investigation in all cases; it took but a few minutes for the processed films to be returned to the theatre, and the surgeon could be busy taking out the appendix in the meantime. He favoured diathermy dissection of the gall-bladder, which made drainage unnecessary.

Mr. Love concluded by referring to the management of the jaundiced patient. Gradual decompression of the liver was the method of choice in cases with prolonged back pressure due to carcinoma of the pancreas, and improved results were obtained by this method as compared with those of sudden decompression.

Mr. HAROLD C. EDWARDS (London) said he agreed with most of Mr. Love's paper and he particularly congratulated him on his exposition of cholangiography. He felt, however, that the interpretation of the results in the hands of anyone less expert might be misleading. He himself had relied on the history and on visual and digital exploration of the bile passages. Although he had not practised cholangiography at operation, he used it as a routine before removal of a drainage tube from the common duct, and it had never yet revealed any residual pathology. Confining his remarks on treatment to uncomplicated affections of the gall-bladder, he said that the two absolute indications for operation were gall-stone colic and recurrent cholecystitis, which in his experience was always associated with stones. He emphasized the risk of cancer in these cases. In the absence of these two absolute criteria great caution should be exercised. Especial care was necessary in non-calculous cases in which radiography showed merely a sluggish function of the gall-bladder, with fat intolerance, flatulent dyspepsia, and no localizing signs in the gall-bladder. The extent of the relief from operation was certainly proportional to the degree of morbidity found. Cases with no obvious disease were sometimes suffering from biliary dyskinesia, but he referred to the dangers of assuming the presence of biliary hypotension or hypertension. It was doubtful whether there was any justification for the various forms of nerve section which were practised abroad. In some cases he thought that there was persistent spasm of the sphincter of Oddi, causing recurrent attacks of pain with occasional jaundice, and in these cases he thought that choledochoduodenostomy was superior to sphincterotomy by any method.

In the ensuing discussion Mr. D. IOAN-JONES (Cardiff) referred to the occasional finding of carcinoma in a stone-containing gall-bladder removed during the course of some other operation. Mr. L. J. HORN (Ebbw Vale) said that the treatment of the case with spasm of the sphincter of Oddi had been referred to, but what of those patients who seemed to have a patulous sphincter, and what was the prognosis in these cases? Mr. R. V. COOKE (Bristol) said that cases of silent obstructive jaundice were frequently retained too long by the physician, who failed to recognize their true nature until rather late. Mr. R. D. RICHARDS (Merthyr) referred to certain elderly patients with coronary

insufficiency and indubitable biliary disease which aggravated the cardiac trouble, and he advocated operation in these cases. Dr. E. A. DANINO (Swansea), speaking as a physician, mentioned the frequency with which he saw cases of chronic pancreatitis giving rise to severe symptoms. He thought that in some cases of otherwise successful surgery pancreatitis might account for persistent flatulence and other symptoms. Mr. J. DUNBAR (Glasgow) said that, contrary to Mr. McNeill Love, and speaking from personal experience, he had found that morphine was a valuable pain reliever in these cases, but it must be given in large doses. He thought that there was still a place for drainage of the gall-bladder in some cases of cholecystitis. With regard to stones and carcinoma of the gall-bladder, it was his view that the latter seldom occurred unless the stones had been causing symptoms. Mr. SOL M. COHEN (Dartford) asked if gall-bladder disease was getting steadily less common in this country. The operation seemed to appear less frequently on operation lists.

Mr. H. GORDON UNGLEY (London) drew attention to a method of cholangiography taught him by Mr. Rodney Smith. In the jaundiced patient it was relatively easy to insert a needle percutaneously into the liver and by seeking a dilated hepatic duct to make a cholangiogram. Mr. R. S. MURLEY (London), referring to Mr. McNeill Love's remarks about pulmonary embolism, said that a pad behind the heels on the operating table was by no means a certain preventive of this complication. He had records of many cases of pulmonary embolism where this and other precautions had been taken. He also said that a completely normal cholangiogram could be obtained with a stone in the common duct, and gave details of a recent case. Dr. F. A. ANDERSON (Connecticut, U.S.A.) also referred to possible misinterpretation of cholangiograms owing to the presence of air bubbles in the opaque medium. Mr. C. JENNINGS MARSHALL (London), summing up before the opening speakers, made some general observations on the relationship of cholesterol to carcinoma. He had been glad to hear some support for cholecystostomy. At a certain stage in cholecystectomy the Rubicon was crossed and in the occasional case one was glad to have even a shrivelled remnant of gall-bladder available later. He warned against the dangers of ligating the cystic duct too far distally, and said that he himself was not averse to leaving a short stump.

Mr. R. J. MCNEILL LOVE, in reply, said that he was sorry that Mr. Edwards had not provoked him more. He agreed that one should not remove a "lazy" gall-bladder. He himself had frequently divided the sphincter of Oddi with a special sphincterotome, with complete satisfaction. A patulous sphincter was probably of little harm. He emphasized the value of slimming the fat patient and agreed with Dr. Danino's remarks about the frequency of chronic pancreatitis and pancreatic insufficiency. As to Dr. Anderson's remarks, the answer was not to inject air into the bile ducts: it was not necessary. He agreed that there was still a place for cholecystostomy.

Mr. HAROLD EDWARDS confined himself to remarks about the post-cholecystectomy syndrome. An American colleague had assured him that the best treatment for these cases was to put the gall-bladder back.

PAIN OF VASCULAR DISEASE

In the afternoon, with Mr. D. IOAN-JONES (Cardiff) vice-president, in the chair, Sir JAMES PATERSON ROSS (London) opened a discussion on the relief of pain of vascular disease in the lower limb. He said that he would confine his remarks to pain of arterial origin. Intermittent claudication, rest pain, the pain of inflammation, and that of ischaemic neuritis were all due to inadequate blood supply, and treatment must be directed to improving the blood supply to the limb. The treatment of the whole patient must come before treatment of the limb, special attention being paid to the condition of the heart and blood, the state of the arteries elsewhere, and to any associated or intercurrent disease. Intermittent claudication was generally due to main-vessel

disease and called principally for an improvement in collateral circulation. This might be achieved by rest in bed, physiotherapy, and drug treatment. The results of sympathectomy were generally good with main-vessel disease but poor where disease was diffuse and there was severe wasting of the affected muscles. He had little experience of intra-arterial drug injection and would leave this to subsequent speakers. A second method of attack in the relief of claudication was arterial grafting, which would be discussed by Professor C. G. Rob. The third method was to decrease the muscle work in suitably affected groups by neurectomy or tenotomy.

Rest pain was due to small-vessel disease and, where the foot was affected, might respond to physiotherapy and vasodilator drugs; but if it did not, then lumbar ganglionectomy might be expected to relieve it in the uncomplicated case. Such pain was not necessarily a manifestation of advanced disease. When complicated by ulceration, sympathectomy should certainly be combined with constitutional measures, but might have to be followed by amputation of a toe. If this wound failed to heal, amputation would be required at a level determined by the pulse in the main vessels of the limb. Rest pain complicated by oedema necessitated treatment of any infection and elevation of the limb. The latter measure might make the pain temporarily worse, and morphine should then be freely given. If oedema could be dispersed, the measures already outlined might be successful; if they failed a major amputation was required.

Mr. J. BAGOT OLDHAM (Liverpool) said that venous lesions might cause pain from thrombosis or venous incompetence. Superficial phlebitis was not infective, and therefore antibiotics were not indicated. Active movement was essential in all cases. While it was exceedingly unlikely that embolism would occur from this condition, he did advocate immediate ligation of the saphenous vein at the groin in those cases where the thigh was involved. Firm bandaging below the knee was of value, but with marked varicosities ligation of the veins was the best treatment. The pain of deep thrombosis might be less, but the risk of embolism was infinitely greater. Heparin not only arrested the process but was usually the best pain reliever. Active movements were started as soon as the process was under control, and firm bandages were applied. The important rule was never to let the leg swell. For the pain of venous incompetence, if this was confined to superficial varicosities, ligation was the best answer.

When the deep veins were involved it must be recognized that there was no really satisfactory cure. The main essential was to teach the patient how to make the best of his disability by avoiding undue standing, resting as much as possible with the foot raised, and, when standing, keeping the muscles active. Support by bandages or elastic stockings and reduction of weight were also very important. The greater the venous incompetence, the firmer the support must be, and the patient must be provided with the type of support best suited to his needs and carefully instructed in its use. A patient who would not co-operate in this regime should not be considered for surgical treatment. Night cramp in the calves was common in association with varicose veins, and in his experience patients chose to relieve this by standing on the cold linoleum. The pain was relieved when the veins were tied, and usually by taking quinine at night.

Mr. Oldham finally referred to his experience in the use of intra-arterial drugs. Alcohol, "prisco," and papaverine had been tried, but he now used only the latter. The dose had varied between 40 and 120 mg., and the procedure was painless, harmless, and simple. He believed that the treatment had been of value.

Mr. HAROLD DODD (London) confined his remarks to the treatment of varicose veins. So far as the pain from deep venous incompetence was concerned, he believed that if one looked after the superficial veins the deep ones would look after themselves. After describing the full examination of these cases, he referred to those patients with small veins, the so-called "early" cases. Mentioning the isolated distribution of the affected groups of veins in these cases, he

added that others had drawn attention to the warm skin in relationship to them and the high oxygen content of the contained blood. He accepted the view recently put forward that these varicosities were directly due to arteriovenous communications in the limbs, and pointed to the value of vein-stripping procedures in these cases.

Arterial Grafting

Professor CHARLES ROB (London) then explained, with illustrative cases, the place of arterial grafting in the treatment of certain very carefully selected patients with arterial insufficiency. He thought it valuable for those cases of so-called primary popliteal thrombosis in young people; also for certain cases of popliteal aneurysm and arteriovenous fistula. In some elderly patients with early gangrene it was justifiable to put in a graft, and he did not think that anything had been lost if such cases subsequently came to amputation. Patients with generalized arterial disease were very rarely suitable candidates for this procedure, and he particularly emphasized the very great importance of considering the whole patient.

Mr. SOL M. COHEN (Dartford) said he thought that much of the effort made to effect vasodilatation was ill-considered. Nature was no fool, and the ischaemic limb was cold and loaded with natural vasodilators. He thought that it would be the verdict of posterity that, in this era, anticoagulants had been a development of infinitely greater value than the vasodilator drugs. Heparin was the drug of choice in patients with arterial lesions, and he also praised the steady and predictable effects of phenylindanedione. He believed that there was no need to depress the prothrombin level below 50% in these cases and thought that it was wrong to aim at the very low levels sometimes advocated. He had a number of questions to ask the earlier speakers. If pain was due to localized vascular disease, why did it radiate so widely? Why did sufferers from claudication not remember the exact day of onset of their trouble, and why didn't they sit down to relieve their pain? In assessing the results of intra-arterial injections, surely we should remember the tendency for claudication to improve spontaneously in many of the milder cases.

He then referred to the value of sympathectomy in arterial disease. This operation was contraindicated in acute thrombotic lesions, legs with "sunset" cyanosis, and those with extensive arterial disease. Diabetic patients also did not do well. He did not think that Buerger's exercises were of the slightest value, and intermittent venous occlusion should be abandoned. It was stupid to draw the patient's attention to his disease by local measures of this kind, and it was imprudent to refer tactlessly to his "hardening arteries." He disagreed with Mr. Oldham in that he believed that anticoagulants should be used for cases of superficial thrombophlebitis. He had no faith in paravertebral block for deep thrombosis.

Mr. H. GORDON UNGLEY (London) spoke in favour of intra-arterial injections for arterial disease. He also thought that paravertebral block was of value. Mr. J. T. RICE EDWARDS (Newport) asked Sir James Paterson Ross whether stripping the posterior tibial nerve was of any value, and he also asked how Professor Rob stored his arterial grafts. Professor ROB then explained the different methods of storage, and said that he favoured freeze-drying, which enabled the graft to be transported quite easily in a tube in one's bag. He did not like venous grafts for most cases. The other opening speakers dealt with further questions raised in discussion. Mr. COHEN said that it was simpler and better to warm the patient than to do a paravertebral block, and he referred to plethysmographic studies which had shown that intravenous injection of drugs produced an effect which lasted almost as long as intra-arterial injection.

Mr. BAGOT OLDHAM detailed some of the evidence which showed that drugs were retained in the limb after intra-arterial injection. He disagreed with Mr. Cohen's remarks about patients with claudication not remembering the exact time of onset of their trouble. He underlined the dangers of injecting long-acting analgesic agents round the nerves in an affected limb.

Sir JAMES PATERSON ROSS said that he had been interested to learn from Mr. Oldham that papaverine seemed to be the only drug of value in intra-arterial injection, for this was the drug which his colleague Mr. J. B. Kinmonth had found of value when applied to the surface of the main vessels of experimental animals. He agreed with Professor Rob's advocacy of attempting to save more limbs, and he was especially interested in Mr. Cohen's remarks about the use of the anticoagulant drugs. He himself was not surprised to find that the muscular pain in some cases radiated so widely, for this fitted in with Sir Thomas Lewis's findings in his experimental injection of the intervertebral ligaments. In reply to Mr. Rice Edwards, he said that the stripping of nerves, or neurectomy of predominantly sensory nerves, was of no value.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Wednesday, July 15

The Modern Forceps Operation

With the president, Professor G. I. STRACHAN (Cardiff), in the chair, Professor T. N. A. JEFFCOATE (Liverpool) opened a discussion on the place of the forceps in present-day obstetrics. Remarking on the shift from a conservative to a radical outlook in obstetrics in the last quarter-century, he pointed out that in many circumstances forceps extraction and caesarean section had become safer for mother and child than spontaneous delivery. Their increased use had not only improved the maternal results but had also effected a dramatic fall in the number of stillbirths and neonatal deaths attributable to the process of birth. The increased safety of forceps delivery was due chiefly to four factors: (1) the disappearance of the high-forceps operation and the replacement of most difficult mid-forceps extractions by caesarean section; (2) insistence on an accurate cephalic grip; (3) the application of forceps earlier in the second stage of labour, often before there is any evidence of distress; and (4) the prevention of maternal risks such as post-partum haemorrhage and anaesthetic complications.

Despite the greatest care in selection of cases unexpected difficulty, usually due to contraction of the pelvic cavity, occasionally confronted even the expert. There must therefore be a place in hospital practice for a considered "trial of forceps," with resort to caesarean section in cases of failure. The proper place for forceps in modern practice, concluded Professor Jeffcoate, was whenever they offered less risk to mother and foetus than did further prolongation of labour. These relative risks must be assessed in the light of the circumstances of each case, and this meant that in domiciliary practice forceps should be applied only when the vertex was below the level of the ischial spines.

Mr. GAVIN BOYD (Belfast) compared the forceps rate in four groups of patients in Belfast. For women booked by midwives the rate was about 5%; for those delivered by general practitioners it was 8.8%. The higher rate of 16.4% in deliveries at the Royal Maternity Hospital reflected a tendency in hospital to anticipate the orthodox indications for the application of forceps. In private cases in hospital the rate was over 36%, probably because forceps extraction tended to become part of a technique which included pethidine and scopolamine analgesia, followed by cyclopropane anaesthesia for delivery.

Failed Forceps

Dr. WILLIAM HUNTER (Newcastle-upon-Tyne) reviewed the problem of failed forceps, a complication which was being less often seen as the standard of obstetrics rose. The three main causes were premature application, disproportion, and an unrecognized posterior position of the head. Premature application of forceps was most likely to occur when a doctor, urged by the patient and her relatives to expedite matters in a prolonged labour, was tempted against

his better judgment to apply forceps before full dilatation of the cervix. He himself considered that any woman whose delivery was not imminent after 36 hours in labour should be transferred to hospital, where it was easier to deal with the patient both as a woman and as an obstetrical problem, unembarrassed by her relatives. Again, a doctor, considering the cervix to be fully dilated, might find under anaesthesia that a rim of cervix was still present. He must then be strong-minded enough to abandon the operation rather than risk injuring mother and baby.

Disproportion was more likely to be overlooked when due to a large baby than when due to pelvic contraction. Ideally, the possibility of disproportion should be suspected antenatally, and if it was not excluded by bimanual examination, aided if necessary by x-ray pelvimetry, the patient should be admitted to hospital for delivery.

The third cause of failed forceps was the unrecognized occipito-posterior position. This malposition was much easier to diagnose antenatally, when it could be corrected abdominally by a manoeuvre he had recently described. Correction was also indicated when there was failure of progress in the first stage of labour and would probably then be followed by spontaneous delivery or low-forceps extraction. When the second stage of labour exceeded two hours or was marked by foetal or maternal distress, then, if the head was in the pelvic cavity, manual rotation of the occiput to the front followed by forceps extraction was the treatment of choice.

Dr. E. PARRY JONES (St. Asaph) discussed the methods of rotating the head before forceps delivery. Manual rotation within the pelvic cavity was the easiest and safest method. When it failed the operator had to decide whether to displace the head upwards and rotate it above the pelvic brim or to effect rotation with forceps. The former manoeuvre involved the risks of prolapse of the cord and, if labour had been long obstructed, of rupture of the uterus: it was a rational procedure only if the shape of the pelvis would allow the moulded head to re-enter the pelvic cavity in its new position.

If forceps rotation was preferred the classical instrument could be used with advantage only if the head was low and there was no bony obstruction at the level of arrest. Kielland's forceps were much better for the purpose, first because they were easier to apply accurately so as to grip the biparietal diameter without displacing the head upwards; secondly, because rotation could be effected with little force and with a minimum of trauma to mother and baby; thirdly, because traction in the line of the handles was in the pelvic axis at all levels; and fourthly because rotation, traction, and delivery could be accomplished with only one application of the forceps.

Mr. GLIDDELL (Melbourne), Mr. HOPKINSON (Church Village), Dr. D. McKAY HART (Glasgow), Mr. O. V. JONES (Bangor), Mr. C. G. ROWORTH (Swindon), Dr. E. NOEL REES (Llanelli), Dr. A. J. MACLEOD (North Uist), Dr. A. BARKER (Whitstable), Mr. LESLIE H. W. WILLIAMS (London), Mrs. P. M. NAIDU (Hyderabad), Dr. M. I. COOKSON (Gloucester), and the PRESIDENT of the Section participated in the ensuing discussion, to which Professor JEFFCOATE replied.

Placental Blood Flow in Toxaemia

Professor J. C. McCLURE BROWNE (London) gave a short paper on the placental blood flow in pre-eclampsia. Many workers had postulated that toxæmia resulted from placental ischaemia, but none had proved it. Together with Dr. Veall he had therefore first devised a method of locating the placental site, using radioactive sodium (Na^{24}). Next, in women in whom the placenta was on the anterior uterine wall, the tracer substance was injected directly into the choriodecidual space, and its rate of disappearance was timed with a Geiger counter. In seven hypertensive women the rate of disappearance of the tracer substance was three times as slow as in eight normotensive women. This indicated that in hypertension the rate of placental blood flow was markedly reduced. Other conclusions reached in this study were that placental ischaemia was the effect, not the

cause, of the hypertension; that the marginal sinus was not the path of venous outflow from the placenta; that the placenta had a large reserve; and that this technique could be applied in other conditions of alleged placental insufficiency, such as post-maturity.

The Climacteric

The meeting of the Section continued in the afternoon, with Professor H. HARVEY EVERS in the chair. Mr. ALECK W. BOURNE (London) discussed the clinical aspects of the menopause. He said that the symptoms were primarily caused by the endocrine readjustment following functional ablation of the ovaries. The severity of the symptoms was probably determined by three factors: (1) Variations in the secretion of androgens and oestrogens by the adrenals in different women at the menopause. (2) An intrinsic factor dependent upon the sexual type of woman. The gynaeoid woman might expect a menopause in accord with her previous reproductive functions, relatively easy and short. The android woman would pass through the change with maximum symptoms. (3) An extrinsic factor in the form of emotional stress. In treatment, a mixture of the male and female hormones was more efficacious than oestrogen alone. Their synergistic action allowed a small dose to relieve both physical and psychological symptoms, and their effectiveness could be estimated objectively by the vaginal smear. Implantation of oestrogen pellets was to be avoided unless the uterus and ovaries were removed at operation.

Mr. T. N. MACGREGOR (Edinburgh) said that the climacteric endocrine derangement caused an upset in the autonomic nervous system. In most women symptoms were absent or negligible, but in a minority psychological factors were paramount in precipitating symptoms. Therefore explanation and reassurance must be the first line of treatment, with oestrogen therapy reserved for severe cases only. He emphasized that no woman with irregular bleeding around the climacteric should be treated with hormones without a preliminary curettage. If both curettage and hormone therapy failed total hysterectomy was indicated.

The Artificial Menopause

Professor H. C. McLAREN (Birmingham) spoke about the methods of inducing artificial menopause. Surgery entailed some small risk both to life and to health, and the likelihood of acute menopausal symptoms if both ovaries were removed. A radiotherapeutic menopause was safer, but in almost half the patients severe hot flushes required treatment later. For cases of non-malignant bleeding, therefore, he was experimenting with the intrauterine application of radioactive phosphorus and cerium. In this way it was hoped to produce the menopause by destroying the endometrium without affecting the ovaries.

Mr. M. D. ARWYN EVANS (Cardiff) compared the incidence of symptoms in three groups of women after artificial menopause. The first group had had the uterus and both ovaries removed; the second had had hysterectomy but conservation of some ovarian tissue; and the third had been treated radiotherapeutically. There was little difference between the groups in the incidence of symptoms in women over 45. Therefore when the menopause was produced surgically removal of the ovaries with the uterus caused no deprivation in older women. In women under 45, however, the conservation of ovarian tissue was desirable, since this was associated with a low rate of menopausal symptoms.

Mr. J. R. E. JAMES (Cardiff), Dr. G. S. FOSTER (Cardiff), Professor J. C. McC. BROWNE (London), Dr. WILLIAM HUNTER (Newcastle-upon-Tyne), and Professor G. I. STRACHAN (Cardiff) joined in the subsequent discussion, to which Mr. BOURNE replied.

Dysmenorrhoea

With Mr. LESLIE H. W. WILLIAMS (London) in the chair, Dr. D. McKAY HART (Glasgow) read a short paper on dysmenorrhoea. The subject bristled with difficulties in

definition, classification, pathology, and treatment. In secondary dysmenorrhoea the treatment was that of the cause, which was usually obvious except sometimes when endometrial tissue was present in abnormal situations. The primary type of dysmenorrhoea was said to occur only in ovular cycles and to be cured by pregnancy, but it might first appear after a delivery. The various theories of causation had little in common. General regulation of the patient's life was important, and operative measures should be reserved for resistant cases, with presacral neurectomy the last resort.

SECTION OF ANAESTHETICS

Wednesday, July 15

A Return to Simplicity?

With Dr. C. LANGTON HEWER (London), the president, in the chair, Dr. M. D. NOSWORTHY (London) opened the session with a discussion of the nature of simplicity. He defined anaesthesia as a combination of central depression and peripheral suppression in varying proportions, depending on the combination of drugs used. He contrasted the older methods, in which central depression predominated, with modern techniques—used since the introduction of relaxants—in which the period of reflex depression was much shortened by the addition of pure peripheral suppression. The advantage of a shortened period of central depression was shorter recovery time. Dr. Nosworthy then emphasized the disadvantages of modern techniques. Relaxants had made inflation of the lungs a common practice and thus abolished the fear of apnoea. For this reason some anaesthetists had also lost the fear of large doses of thiopentone, despite its dangerous circulatory depression and prolonged recovery time. He recommended that thiopentone should be used only in "sleep doses," and should be followed by 75% nitrous oxide in oxygen with a relaxant. He doubted whether in some patients nitrous oxide alone produced surgical anaesthesia, the lack of which might be the cause of circulatory disturbances and hiccups. In these cases the addition of pethidine, procaine, or a volatile anaesthetic was more rational than administration of thiopentone.

Dr. Nosworthy concluded by defending the terms applied to pulmonary inflation: it was called "passive ventilation" when the respiratory arrest was due to central depression, muscular paralysis, or both; "controlled respiration" indicated that breathing would be suspended but for hyperventilation. He believed that these techniques, like that of endotracheal anaesthesia, should not be used unless clearly indicated.

Dr. Nosworthy was followed by Dr. W. W. MUSHIN (Cardiff), who said that simplicity depended on understanding, and apparent complexity of anaesthetic technique should be condoned only if it was understood by the anaesthetist and beneficial to the patient. He said that teachers should remember that many undergraduates were future general practitioners, to whom anaesthesia would be only a part of their work, and the circumstances in which they would later administer anaesthetics would be different from those of a well-equipped hospital. He thought that all generations believed contemporary techniques in anaesthesia were unduly complicated, and the methods of to-day would seem remarkably simple to those who came after.

In the discussion afterwards, Dr. G. HOYLE (Tamworth) raised the problem of analgesia for domiciliary midwifery, and made a plea for the administration of chloroform to be taught to medical students. This seemed in many cases the only practical agent.

Dr. M. H. ARMSTRONG DAVISON (Newcastle-upon-Tyne) agreed that the problem of anaesthesia for domiciliary midwifery was a neglected one. He felt that open ether was a difficult anaesthetic, and that students should be taught to administer nitrous oxide and ether; if they were taught the basic principles of the subject thoroughly they would

be able to master other techniques. Dr. H. R. YOUNGMAN (Cambridge) believed there was no serious danger of an explosion when ether was used in the presence of an open fire if there was a draught up the chimney; but Dr. N. S. WALLS (Southport) disagreed with this.

Dr. H. M. MOHELSKY (Vienna) said that the surgeon should be taught simplicity. Dr. RONALD JARMAN (London) wondered whether the results of modern anaesthesia were better than those obtained by older anaesthetists: the modern operation caused less strain to the surgeon and more to the anaesthetist, and he wondered how long the anaesthetist should pander to the surgeon. Dr. R. BLAIR GOULD (London) said that the anaesthetic techniques used in teaching hospitals were wholly unsuitable for teaching medical students, and Dr. J. E. GILLESPIE (Melbourne) pointed out that ether had the advantage of illustrating clearly the stages in anaesthesia. Dr. K. S. THOM (Newport) thought that students were well taught and agreed that chloroform was the most satisfactory practical anaesthetic for domiciliary midwifery. Dr. T. CECIL GRAY (Liverpool) believed that a mixture of 75% nitrous oxide and oxygen would always keep a patient unconscious, but this was doubted by Dr. J. G. BOURNE (London). Among others taking part in a lively discussion were Dr. C. LANGTON HEWER, Dr. R. P. HARBORD (Leeds), Dr. R. F. WOOLMER, and Dr. D. H. ISAAC (Port Talbot).

Hypothermia and Anaesthesia

At the afternoon session Dr. Hewer relinquished the chair to Dr. RONALD JARMAN (London). The session opened with a short paper by Dr. E. J. DELORME (Edinburgh) on hypothermia and anaesthesia. Dr. Delorme explained that, when the temperature of the tissues was reduced, less oxygen was required to sustain cellular life; if the body could be uniformly and reversibly cooled, the supply of oxygen to the tissues by the blood might be suspended. Degrees of hypotension and ischaemia which would be injurious at normal body temperature might then be tolerated and—in theory—the advantages of the hypotensive techniques retained without hazarding the safety of the patient. Experimental studies on dogs had shown that the circulation could be stopped for relatively long periods at lowered body temperature, and was followed by complete recovery. This was also true for the local circulation of various organs, including the brain. Dr. Delorme described the technique for cooling the body by the extraction of heat from an exteriorized circulation of the blood, and he discussed its advantages over surface cooling.

Hypotension

A discussion on the case against hypotension was opened by Dr. M. H. ARMSTRONG DAVISON (Newcastle-upon-Tyne). He said that his case depended upon the side-effects of the profound circulatory disturbance of hypotension, and the dangers in the methods by which it was achieved. Hypotension itself might cause cerebral anoxia, which, because of its frequency and serious consequences, was the most important argument against the use of the technique during operation. It might also cause cerebral thrombosis, renal or hepatic damage, haemorrhage from a large vessel during the period of hypotension or reactionary haemorrhage afterwards, cardiac failure, massive pulmonary collapse, and paralytic ileus. There was a risk of failure to restore normal blood pressure, and the production of cardiac arrhythmias by pressor drugs used for this purpose. Of the methods for achieving hypotension, deep chloroform anaesthesia had the particular danger of delayed poisoning, spinal analgesia might produce neurological lesions, and arteriotomy could lead to clinical shock. He concluded that hypotensive techniques should be used only when the operation was impossible without a bloodless field and could not be more safely obtained by some other means.

Supporting Dr. Armstrong Davison, Dr. R. F. WOOLMER (Bristol) said that hypotension might make surgery easier, but its price was morbidity and mortality. He quoted a

recent analysis of the experience of 178 British anaesthetists who had used hypotensive techniques: 57% of their patients received methonium compounds, and 33% high spinal analgesia; 10% underwent arteriotomy, and in 9% of cases hypotension was obtained with other methods. The number of cases was 21,125, of which the number of complications was 549. There were 190 cases of delayed post-operative recovery, 164 of reactionary haemorrhage, 37 of thrombosis, and 24 of other acute cardiovascular complications. Forty-six deaths were reported in the series, and he felt there was reason to believe that at least 39 of them were directly the fault of hypotension. Dr. Woolmer said he thought 39 deaths which were otherwise preventable was a high price to pay for a means of diminishing bleeding. Dr. H. C. CHURCHILL-DAVIDSON (London) said he did not believe that the kidney was inevitably damaged during hypotension: red blood corpuscles and albumin appeared in the urine in many conditions, and oliguria could be caused by deep anaesthesia. Dr. W. W. MUSHIN (Cardiff) said that deaths after operations in which hypotension had been used occurred within six days, but deaths after operations in which other techniques had been used occurred up to 28 days afterwards. Dr. T. M. WILLIAMS (Swansea) stated that the complications of blood transfusion should be set against those of hypotension, and Dr. S. H. GRAHAM (Cardiff) speculated on the critical figure for the blood pressure. Dr. C. LANGTON HEWER (London) complained that anaesthetists had not completely exploited the simpler methods of haemostasis, such as infiltration with dilute adrenaline. Dr. RONALDSON (Hull) gave an account of 500 cases of hypotension and stated that safety depended on careful selection of patients. He mentioned the work of the anaesthetic out-patient department that he had instituted. Dr. M. D. NOSWORTHY (London) agreed with Dr. Ronaldson, and Dr. JARMAN stated that as long as the pulse rate of his patients was below 100 during the period of hypotension he did not feel any anxiety. Drs. J. MIDDLETON PRICE (London) and S. M. ANDERSON (London) also contributed to the discussion.

SECTION OF CARDIOLOGY

Wednesday, July 15

Pulmonary Heart Disease

With the president, Dr. J. MAURICE H. CAMPBELL (London), in the chair, Dr. A. J. THOMAS (Cardiff) opened a discussion on pulmonary heart disease. He said that there were many diseases of the lung fields, or of the pulmonary vasculature, or of the muscular and skeletal cage of the thorax which would cause pulmonary hypertension or increased pulmonary blood flow, and so affect the right heart by causing increased work for the right ventricle. The progressive massive fibrosis of pneumoconiosis caused considerable right ventricular hypertrophy, with eventual right heart failure of low-output type. The electrocardiograph frequently showed typical changes of right ventricular hypertrophy when the weight of the right ventricle exceeded that of the small left ventricle. He thought that the clinical and other findings of advanced pneumoconiosis indicated an obstructive type of pulmonary vascular lesion. Intercurrent bronchiolitis could cause anoxic failure at any stage, but eventually severe pulmonary hypertension was present and heart failure was irreversible.

In emphysema the cardiac output was increased, the pulmonary blood flow was ample, and pulmonary hypertension was only moderate. Infection and anoxia would increase the pulmonary hypertension, but this condition was reversible. The degree of right ventricular hypertrophy was less than in pneumoconiosis, and the cardiographic signs were later in appearing. Bronchiectasis was of importance in the causation of pulmonary heart disease, but the mechanism was not yet fully understood.

Professor J. GOUGH (Cardiff), reading a paper on the pathological anatomy of the lungs associated with some forms of cor pulmonale, said that death certificates showed that heart disease in the anthracite miners of South Wales was 50% more common, and in the non-anthracite miners 30% more common, than in the general male adult population of England and Wales, and there was good evidence that this excess heart disease was pulmonary heart disease consequent upon pneumoconiosis. The majority of these cases were associated with the characteristic massive fibrosis found in coal workers, associated with severe endarteritis and thrombosis in the blood vessels. A notable feature was the extension of granulation tissue through the walls of the vessels into the lumen, causing disruption of the elastic laminae of the vessels. Injection with radio-opaque material showed a great reduction in the pulmonary arterial tree as a result of these changes. He had studied, by means of the large-section technique, thin sections representative of the whole lung in cases with non-industrial chronic bronchitis and emphysema. He regarded chronic bronchitis with dilatation of the bronchi as an important and striking feature in many cases of cor pulmonale, and the blocking of the bronchi with pus could readily account for the anoxia that developed during the recrudescence of infection. The large-section technique showed clearly the importance of the emphysema element in the development of cor pulmonale in chronic bronchitis and emphysema, but the emphasis was now on the changes in the bronchi and in the communications between bronchial and pulmonary arteries.

Dr. WILLIAM EVANS (London) thought that the most important factor in the production of pulmonary heart disease was obstruction within the pulmonary arteries, and that in any discussion on pulmonary heart disease the emphasis was on pulmonary hypertension. He described two groups of patients with pulmonary hypertension. In the first, the pulmonary vessels were blocked with material arising elsewhere, such as massive pulmonary emboli, bilharzia ova, or carcinomatosis. In the second group, the obstruction arose locally with the changes of endarteritis fibrosa of the lesser pulmonary arteries. This occurred in some patients with patent ductus arteriosus, auricular or ventricular septal defect, idiopathic dilatation of the pulmonary artery, congenital pulmonary polycystic disease, emphysema, and possibly mitral stenosis. The most noticeable symptom of pulmonary hypertension was progressive breathlessness. Cough was seldom distressing. Syncope was a characteristic symptom, and might cause sudden and unexpected death in this condition. He described the signs of pulmonary hypertension, including cyanosis, distended neck veins, increased pulsation in the pulmonary area, an added sound in early systole and a terminal triple rhythm. The electrocardiogram showed right heart preponderance; radiology showed enlargement of the right heart with prominent pulmonary arteries. In some cases there were signs of an associated condition such as a patent ductus or septal defect. The mechanism of the pulmonary hypertension was extensive endarteritis fibrosa blocking innumerable small pulmonary arteries. A preliminary arteriogram of the lung at necropsy indicated the area most affected by arterial blockage, and histological examination showed that the endarteritis fibrosa affected particularly arteries whose media showed a congenital aplasia or hypoplasia.

The PRESIDENT (Dr. J. Maurice H. Campbell, London) spoke of the difficulty in deciding when the heart was involved in patients with dyspnoea from chronic lung disease. Signs of right heart failure provided a certain but late indication of heart involvement, but a sudden increase in dyspnoea, not associated with a pulmonary infection, was often an earlier sign. In mitral stenosis he had not so far found irreversible pulmonary hypertension. After mitral valvotomy the pressure usually came down by a half and might return to normal. In young patients with an atrial septal defect or patent ductus arteriosus pulmonary hypertension was uncommon, whereas in ventricular septal defects it was common. Pulmonary hypertension with a ventricu-

lar septal defect might cause the Eisenmenger complex, and pressure changes were more important than the degree of overriding of the aorta.

Dr. R. A. PARKER (Cardiff) said that thickening of the intima of the small pulmonary arteries was part of the process of ageing and that the changes in emphysema were an accentuation of the normal old-age changes. In mitral stenosis there was medial hypertrophy and often an acute arteritis. He had not encountered in normal people the hypoplastic lesions described by Dr. William Evans, but had found them in mitral stenosis. Dr. JOHN C. GILSON (Pneumoconiosis Research Unit, Llandough) found clinical or cardiographic signs of cor pulmonale in one-sixth of the last 150 cases with progressive massive fibrosis that he had studied; these often followed an acute infection of the lung. He thought that dust-suppressive measures would eventually prevent pneumoconiosis, and his unit was studying the effect of removal of the factor of tuberculous infection in lowering this attack rate of progressive massive fibrosis in patients with simple pneumoconiosis. Dr. A. RAE GILCHRIST (Edinburgh) spoke of the concept of malignant hypertension in the pulmonary circuit which, by analogy with malignant hypertension in the systemic circulation, might be reversible. Mr. H. R. S. HARLEY (Cardiff) thought that pulmonary hypertension in mitral stenosis was due partly to the valvular stenosis and partly to changes in the small vessels. He regarded these changes as secondary to the pulmonary hypertension, which he thought was reversible.

Professor GOUGH, in reply to points raised in this discussion, said that environmental factors were largely responsible for the amount of dust found in the lung. In young patients developing progressive massive fibrosis there was histological and laboratory evidence of tuberculous infection. In this condition he thought the arterial changes were primary and not secondary.

Dr. I. K. R. McMILLAN (London) showed a colour film on the action of normal and pathological heart valves. This showed in a startling way how the heart valves worked and illustrated the difficulties encountered in the surgical treatment of valvular stenosis.

SECTION OF CHILD HEALTH

Wednesday, July 15

Care of the Newborn

The president, Professor A. G. WATKINS (Cardiff), was in the chair when a panel consisting of Professor W. C. W. NIXON (London), Professor WILFRID F. GAISFORD (Manchester), Dr. E. NOEL REES (Llanelli), and Dr. DOROTHY H. ALDIS (Cardiff) answered "Any Questions?" on the care of the newborn.

The panel was unanimous that there was no advantage in withholding the first feed of the full-term baby for more than six to eight hours; that there was no evidence that the administration of hormones to premature babies was worth while; that no benefit to the mother or child followed antenatal relaxation exercises; and that the main duties of the father in the antenatal period were household chores and baby-minding where necessary. No ill-effects followed the administration of oxygen to full-term babies, but there was a real danger of causing retrolental fibroplasia in premature babies. Oxygen saturation should never exceed 40% and should be given for as short a period as possible. B.C.G. vaccination of newborn babies was thought to be well worth while, not as a routine but in selected cases. On both the last questions Professor A. WALLGREN (Stockholm) concurred with the panel.

On the remaining questions there was a division of opinion among the panel. Some felt that there were advantages in nursing a baby naked in hospital, but the majority opinion of both the panel and other members was that a moderate

amount of clothing should be used. On the question whether babies should be nursed in communal nurseries or at the mother's bedside it was stated that there was no difference either in the incidence of infection or in the rate of breastfeeding whichever method was used. Those with personal experience favoured having the baby with the mother during the day but removing it at night, and with this view those fathers who spoke agreed. Getting the mother up on the third or fourth day after childbirth was favoured by those who were concerned mainly with hospital practice, but opposed by the family doctors and mothers; the latter made the point that the mother would probably not have the opportunity for similar rest for the remainder of her life, unless a subsequent pregnancy occurred. No difference was seen in lactation whether early or late rising was practised.

Surprisingly, the panel and the meeting were evenly divided on whether routine circumcision of the newborn should be performed, the family doctors in the main being in favour of it. The common failure of lactation when a mother returns home from hospital was discussed at length without any general agreement. Some felt that the main reason was laziness, while others felt that sociological or psychological factors were most important; failure to empty the breasts completely was thought to play a part, and it was stated that the incidence of breast abscess was as high as 5%. Here again the beneficial effects of adequate rest were stressed. On the question of the most satisfactory feed interval for babies a lively discussion on demand *versus* régime feeding took place, the majority favouring the latter. The matter was epitomized by Dr. V. MARY CROSSE (Birmingham), who thought that with an intelligent mother demand and régime feeding would amount to the same thing.

Lastly, on whose should be the care of the breasts, the obstetrician thought the paediatrician should look after them, the paediatrician had no opinion and thought it a matter of individual preference, the family doctor thought it was his responsibility throughout, while the mother was heard diffidently to mention the mother.

Accidental Poisoning in Childhood

Professor A. V. NEALE (Bristol), vice-president, then took the chair, and Dr. D. SWINSCOW (London) opened a discussion on accidental poisoning in childhood. He said that the age group for which the death rate from acute accidental poisoning was highest was 1-2 years. In England and Wales, in 1950-1 the rate for that age group was 37 per million of the population, only slightly less than the corresponding rate of 41 for influenza. Boys were more commonly involved than girls. Figures obtained from the Registrar-General showed that most of the poisons were medicaments and that the number of deaths caused by them was tending to increase. In 1950-1 the principal medicaments responsible were iron and strychnine preparations, antihistamines, and anodynes. Many of the preparations were not normally regarded as being poisonous, and were relatively harmless to adults while being dangerous to children. The best method of prevention seemed to be to label prominently as poisonous even such supposedly innocuous drugs as aspirin and ferrous sulphate. The unpleasant taste of many of the preparations causing death suggested that the sugar coating of pills was not the danger that had been sometimes contended.

Dr. J. O. CRAIG (Edinburgh) reported a similar increase in accidental poisoning in Edinburgh and Aberdeen. Here, too, the main rise had been in poisoning by medicaments. The most important at the present time was ferrous sulphate, and the most lethal were strychnine and methyl salicylate, while the antihistamines came high on the list. It was necessary to educate the public in the idea that all medicines were poisonous to children. There were some substances—for example, linimentum A.B.C.—which could well be removed from the pharmacopoeia, and others in which modification of the vehicle—for example, lin. meth.

sal.—or in the composition of compound tablets—for example, purgatives containing strychnine—was indicated.

In the subsequent discussion the frequent difficulty of inducing vomiting was stressed. Attention was drawn to the danger of prescribing medicaments which tasted nice, the rarity of metaldehyde and vitamin poisoning, and the differences between country and city in the frequency of the various poisons encountered.

SECTION OF DERMATOLOGY

Wednesday, July 15

With the president, Dr. R. M. B. MacKENNA (London), in the chair Dr. LOUIS FORMAN (London) opened the symposium on practical problems in the management of disorders of the skin in general practice with a paper on the management of pruritus. He said the origin of the sensation of itching was in the nerve endings of touch and pain in the skin. The appreciation of itching depended on the attention paid to the sensation. The sensual element of itching and scratching was a matter of common experience. The causes of generalized pruritus in childhood were food or epidermal allergy or an infestation. In youth, anaemia, metabolic factors—for example, diabetes—and renal disease might be additional causes. In mature age, deficiencies and glandular factors might play a part. An important but uncommon cause of pruritus was malignant disease or the reticuloses. Toxic or allergic reactions to drugs also led to itching. The nutritional deficiencies might lead to hyperkeratosis and atrophy of the skin seen in old age. The nutrition of the skin might suffer at the menopause and be improved by hormones. Testosterone was known to increase the amount of oxygenated blood in the skin. Circulatory insufficiency might be the cause of the pruritus occasionally observed with mitral stenosis, cardiac insufficiency, and hypertension. Pruritus excited emotional reactions, and the experimental work of Cormia had showed that the threshold value of itching was lowered by psychic trauma and restored by reassurance. With long-established pruritus the patients might be found to suffer from an anxiety state, tensions, obsessions, and even delusions. The antihistamines applied to the skin were capable of sensitizing the patient. Sedatives internally were indicated only to relieve anxiety or tension states.

Dr. W. J. O'DONOVAN (London) said that encephalography might show changes suggestive of epilepsy when specific remedies such as soluble phenytoin might relieve the pruritus. Tinct. opii in large doses for a month might break a vicious circle of itching.

Ringworm of the Feet and of the Scalp

Dr. JOHN T. INGRAM (Leeds) opened a discussion on the differential diagnosis and the treatment of ringworm of the feet. Any affection of the toes or feet, he said, which suggested the possibility of tinea pedis—and that meant almost every affection—required examination for fungus before a diagnosis could be made. As to treatment, it had to be remembered that tinea pedis was very prevalent in certain sections of the community, that it was very contagious under certain circumstances, and that it was often incurable. Nevertheless the condition could be controlled in the majority of patients and apparently cured if treatment was thorough and embraced the contacts and fomites. Relapses in hot weather were to be expected. Sandals or well-ventilated shoes, cotton socks, cleanliness, careful drying of the feet and toes, and the use of a dusting powder spelled salvation.

Dr. L. FORMAN (London) said that demonstration of fungus in exudative phases could be difficult, and repeated examinations were necessary.

Dr. W. N. LEAK (Winsford) found ointments containing dithranol were better if dispensed in metal tubes.

Dr. J. MARTIN-BEARE (Belfast) read a paper on difficulties in the diagnosis and treatment of scalp ringworm; it was based on an epidemic which involved 1,000 children. 12.6% of all schoolchildren and 25% of schoolboys were affected. With *Microsporon audouinii* infection x-ray epilation was the treatment of choice but was not necessary with *M. canis* infections. Routine cultures were necessary. Infection with *Trichophyton sulphureum* was relatively common (55 cases in the series) and was difficult to treat. Local epilation was attempted in 40 cases, with 6 failures, and was not recommended.

Nummular Eczema

Dr. C. HOWARD WHITTLE (Cambridge) opened a discussion on the problem of nummular eczema. He discussed the differential diagnosis from ringworm, psoriasis, seborrhoeic dermatitis, and contact eczema, and analysed a pilot series of 100 cases. His conclusions were that drying and decreasing agents prepared the ground, but atopy frequently provided a favourable soil. Local trauma might select the site and time of onset. Stress factors were very important and might precipitate, and maintain, activity.

Dr. W. J. O'DONOVAN (London) hoped the word "plurifactor" dermatitis would not be introduced into our literature. The recognition of atopy and genetic factors was a throwback to the French concept of diathesis.

Interpretation of Tests for Syphilis

Dr. C. S. NICOL (London) spoke on difficulties in the interpretation of the serological tests for syphilis. There should be a complement-fixation and a flocculation test, he said, and only positive or negative results, no doubtful results. Other diseases were capable of giving positive results besides syphilis, but there was a prospect that the treponemal immobilization test might elucidate this problem. A positive result in a newborn baby might be due to carry-over of reagin from the mother and would become negative after a few weeks.

Hypostatic Ulcers

Dr. D. S. WILKINSON (Amersham) spoke on the prevention of recurrences of hypostatic ulcers. He said the problem of the hypostatic ulcer was not only one of healing but of keeping healed. The same measures used at the outset to reverse the conditions leading to the ulcer should be continued as a long-term policy to prevent recurrence. In a series of cases thus treated by a routine of varying efficiency at different hospital clinics, it was found that when this was efficient the recurrence rate was 12.5% in two years, and when inefficient 45%. A large proportion of breakdowns, therefore, were prevented by good management. Accounting for the 12.5% were patients in whom poor intelligence, arthritis, hypertension, bad social conditions, and a poor psychological attitude were commonly found.

Overtreatment

Dr. I. B. SNEDDON (Sheffield) discussed overtreatment, which arose more often in dermatology, he thought, than in other branches of medicine because the patient and his relatives adopted a more critical attitude to the doctor, the signs of disease being visible. A high standard of cure was expected. The patient contributed to overtreatment by applying homely or proprietary remedies. The keynote to successful treatment was correct diagnosis.

A simple classification of skin disorders was: (1) those which got better spontaneously, such as pityriasis rosea; (2) those due to infection requiring active treatment; (3) those requiring skin rest; and (4) those which were incurable. The use of antibiotics in pyogenic infection over long periods caused sensitization of the skin. Fungicides, particularly the mercurials, were also potent sensitizers.

In the eczema-contact-dermatitis group the inflammatory reaction of the skin was often confused with infection, and antiseptics and antibiotics were applied. All the skin required

was rest, and this was best obtained by the use of inert evaporating lotions. Occlusive tar bandages had a wide evaporating lotions. Occlusive tar bandages were useful in subacute dermatitis and infantile eczema.

The Home and the Skin

Dr. GEOFFREY A. HODGSON (Cardiff) read a paper on the influence of home conditions on skin diseases, emphasizing the effect of unsatisfactory home conditions on common skin diseases. Household chemicals, clothes, plants, and washing agents produced eczematous skin damage. Unsatisfactory home conditions often comprised work, financial, and housing problems, difficult personal relationships, and problems peculiar to the housewife. The mechanism of their effect upon skin diseases was discussed, with particular reference to alteration of skin reactivity, sweating, and scratching, and with special reference to the types of dermatoses produced or aggravated by it.

The Clinical Meeting

About 50 members were present in the afternoon at the clinical meeting in the Cardiff Royal Infirmary. The discussion of cases, conducted by Dr. R. M. B. MacKENNA, was lively and interesting, and the simple explanatory notes on the rarer conditions were helpful and much appreciated, especially by the general practitioners present.

SECTION OF PATHOLOGY

Wednesday, July 15

Gastro-enteritis in Young Children

With the president, Professor J. B. DUGUID (Newcastle-upon-Tyne), in the chair, Professor ROBERT CRUICKSHANK (London) opened a discussion on gastro-enteritis in young children. In children over 1 year of age acute enteritis was mostly due to salmonella and shigella infections; subacute enteritis might be caused by giardia. Sonne dysentery had occurred in recent years in epidemic waves, with greater prevalence in winter. Salmonella infections might occur sporadically as well as in family or larger outbreaks. Investigations had been made into the possibility that a virus might be a cause of mild diarrhoea affecting both adults and infants and of epidemic nausea and vomiting. Infantile diarrhoea and vomiting was mainly a disease of artificially fed infants under 1 year of age in poor-class urban communities.

Deaths from this disease had fallen considerably since 1900, when some 30,000 infants died from it annually. In 1951 deaths numbered 891. Nevertheless the disease remained a problem of some magnitude and affected a large number of infants.

Great advances had been made in treatment, especially by rehydration and chemotherapy. Recent investigations in many countries had shown a close association between infantile diarrhoea and vomiting and certain specific types of *Bact. coli*, particularly O 111, O 55, and O 26 (Kauffmann's classification). Encouragement of breast-feeding, improved hygienic standards, early recognition of infection, and adequate treatment were measures which should help to eliminate this preventable disease.

Incidence of Types of *Bact. coli*

Dr. J. SMITH (Aberdeen) reported that in North-east Scotland the peak epidemic year of infantile gastro-enteritis was 1947, when 240 cases were reported with 104 deaths (40% fatality rate). In 1952 there were 24 cases and no deaths. In 1947, O 111 strains of *Bact. coli* predominated, the sucrose-positive H2 variety being isolated from 227 cases and the sucrose-negative H12 from 6. In 1948, H12 strains were more prevalent, but they had not been isolated since 1951. O 55 strains were first isolated in 1947; their prevalence increased until in 1949 109 strains were isolated, but in 1952 the O 55 strain was isolated on only four

occasions. From 1947 to 1951 only the H6 variety was found, but later a few H7 and H21 strains had been isolated. O 26 strains, first looked for in 1950, had been obtained from 18 cases and one carrier. In 1952 O 119 strains were identified in 11 cases and 10 carriers. Since 1949, 20 cases of gastro-enteritis had been observed in which none of these *Bact. coli* types had been found. Dr. Smith considered that from the association of cases and outbreaks of this disease with specific *Bact. coli* types, it must be presumed that they were the aetiological agents.

Dr. JOAN TAYLOR (London) described an attempt to throw light on the extent of the problem of infantile gastro-enteritis. Specimens from infants living in their own homes and from infants admitted to an infectious diseases hospital were examined. During 1952 and 1953 317 infants were investigated. No bacterial cause could be isolated from 225 infants (71%), though possibly virus infection might have accounted for some of them. Specific types of *Bact. coli* were found in 55 (17%). *Sh. sonnei* was isolated from 33 infants (10%), and other pathogens (including some paracolon, some *Giardia*, and one *S. typhimurium*) from 6 (2%). The previous history of the infants was also investigated. Those who had been in institutions accounted for 7 of the 170 infants with no bacterial cause found, for 10 of 27 with coli sero-types, and for 4 of 35 with *Sh. sonnei*. On two occasions infants with O 111 strains of *Bact. coli* had been admitted to nurseries, and these strains had spread without causing illness.

Prevention of Gastro-enteritis in Hospital

Dr. K. B. ROGERS (Birmingham) described a trial organized to prevent epidemics of gastro-enteritis in a children's hospital. Infants who had gastro-enteritis, irrespective of bacteriological findings, were admitted to one of the three floors of an infants' block. The other two floors were reserved for infants suffering from diseases not associated with gastro-enteritis. Infants who had been in any institution during the previous month or who were vomiting without obvious cause formed a third group. They were admitted to cubicles elsewhere in the hospital, and bacteriological investigations were carried out. If the specific *Bact. coli* types were isolated the infant was sent either home or to the gastro-enteritis ward, but otherwise they were sent to a "clean" ward. The duration of hospital stay during the trial year was compared with that during preceding years. Infants with pyloric stenosis, intussusception, and pneumonia were particularly studied. He found that *pari passu* with the elimination of the specific types of *Bact. coli* there was a very marked reduction in the incidence of gastro-enteritis and that the infants were not so long in hospital. In previous years between one-fifth and one-quarter of the cots were occupied because of gastro-enteritis, which seemed to be an avoidable condition.

Cross-infection

Dr. M. T. PARKER (Manchester) reported an investigation on hospital cross-infection with salmonellae. During the last four years he had investigated 213 infections (85% of which were due to *S. typhimurium*) in children under 2 years of age. Most of the cases occurred in a few large outbreaks. Spread from ward to ward and from hospital to hospital occurred easily and could usually be traced to the transfer of infected patients. Infection became established only in wards in which most of the patients were less than 2 years old. Spread occurred as easily in cubicle wards as in open wards. Salmonella infection in the general population was common only in the summer months, but cross-infection in hospitals occurred at all seasons. The behaviour of the disease suggested that the infant excretor was the main source of infection and that the organisms were transferred from patient to patient without preliminary multiplication in food. The hands of attendants might become contaminated not only by direct contact with faeces but by contact with equipment and surfaces near the infected

infant. The relative importance of direct contact and of dust in the transmission of infection was not yet known.

Dr. A. T. RODEN (London) described an investigation, undertaken with Dr. Joyce Wright (London), in a large isolation ward for infantile diarrhoea. Between January 27, 1949, and January 10, 1950, 142 cases were admitted to the ward. Rectal swabs were taken from each infant on admission and then at intervals of two or three days until discharge. *Bact. coli* type O 111 was found in 30 infants on admission and type O 55 in 11 infants. From one swab, both O 111 and O 55 types were grown, and results were negative in 100 cases. Of 111 infants at risk, 55 (50%) became cross-infected with type O 111, and of 130 infants at risk 46 (35%) with type O 55. The proportion of cases found to become cross-infected rose progressively with length of stay in hospital. Thus, among the cross-infections with type O 111 the proportion rose from 8 out of 39 cases (21%) staying less than four weeks to 13 out of 15 (87%) staying more than 12 weeks; and, among the cross-infections with type O 55, from 3 out of 43 cases (7%) staying less than four weeks to 11 out of 15 cases (73%) staying more than 12 weeks. Fifty-three of the 55 cross-infections with type O 111 and 42 of the 46 cross-infections with type O 55 were found during the first six weeks of hospital stay. This finding supported the presumption that the long-stay cases did in fact have to have their treatment extended because they became cross-infected.

The Importance of Breast-feeding

Dr. SCOTT THOMSON (Cardiff) discussed the difficulties and importance of breast-feeding. Professor W. F. GAISFORD (Manchester) considered that prevention of gastro-enteritis lay in actual breast-feeding and not the provision of breast-milk from human-milk banks. Dr. T. J. RENDLE-SHORT (Cardiff) said that severe gastro-enteritis was not often seen after 18 months of age, and asked whether there might not be some protective factor in human milk. Professor DUGUID mentioned the possibility that bottle-fed infants might be more exposed to the risk of infection. Dr. JOYCE WRIGHT reported the finding of unsatisfactory conditions in the preparation of infants' bottle-feeds, both of cow's and of human milk. Dr. BERYL CORNER (Bristol) stated that only the rigorous application of isolation techniques in cubicles had prevented the spread of *Bact. coli* O 111 and O 55 among infants in hospital. Dr. I. G. INNES (Hull) stated that he rarely saw severe infantile gastro-enteritis in general practice.

SECTION OF PSYCHIATRY

Wednesday, July 15

Stresses within the Family

With the president, Dr. T. J. HENNELLY (Cardiff) in the chair, Dr. H. V. DICKS (London) opened a discussion on family tensions and the work of the general practitioner. He deplored a tendency for practitioners not to look after the whole family, since family relationships affected the type of reaction of the individual to stress. Doctors had been insufficiently educated in holistic thinking to include the human environment. A man of 39 in mild cardiac failure went into hospital to die, as he said, and might have done, but for the chance discovery that his father had died at 39 and his lifelong expectation had been to do likewise.

With the fragmentation of the family due to modern industrial civilization, there were fewer possibilities of the child's making the family a safe place. A minority might thereby reach a higher state of maturity because of their greater independence; the majority were left with comparatively little scope for their emotions. The minute family group of three had to contain an over-condensed mass of feelings. Not all conflicts could be resolved by giving way to the feelings. Other mechanisms such as repression or

dissociation prolonged the conflict and could lead to character and even to somatic structural changes. We needed to know more about how bad feelings arose in the patient; and in this the importance of the early mother-child relationship had been emphasized by Bowlby, Spitz, and others.

The ailing, regressing child who was showing symptoms of deprivation was in the grip of a self-perpetuating mechanism. When married, he or she might look for a parent in the spouse and not for a partner. Worse, they might accept in the partner only their own highly subjective image of the other, thereby angering the spouse by rejection of much of the latter's real personality. To such an unstable marriage the birth of a child might well be an intolerable strain.

Technological change was often blamed for psychological ills, but doctors needed a more proximate vision to see, within the social phenomenon, the play of interpersonal relationships in the family. With such a view, many otherwise ill-defined disorders fell into a recognizable pattern.

Marriage and Security

Dr. W. S. MACDONALD (Leeds) said that he learnt very early as a general practitioner to deal with people rather than with diseases. He had also learnt to look beneath such reports as that 35% of all girls marrying at 20 or under were pregnant at the time of marriage, and to consider the stresses latent in this situation. What insecurity for mother and child might be contained in this state of affairs? Matrimony was a great provider of security and a sense of parental responsibility was scarcely possible outside it.

The modern practice of having confinements in institutions was excellent for almost everything except for family stability. It might hinder the growth of maternal love and hence baby security; anxiety was a prime reducer of maternal milk; and it was essential to the mother to maintain close links with her family during the lying-in period. Modern social devices were good so long as it was remembered that the character of the ancillary worker was perhaps the most important factor.

School provided many areas of stress: the drive to pass the "11+" examination, the valuing of academic success above character, insufficient time to think, and insufficient emphasis on the responsibilities of adolescents were notable examples. Girls were rushed from school into work and into marriage without consideration of possible future motherhood. Boys lacked proper help in vocational choice. The changing pattern of age distribution, the disappearance of the unattached spinster aunt, and the plight of the old people with no place of their own added to the burden on the apparatus of social care.

Beyond all the medical investigations lay the mysterious factor in human reaction to illness, sometimes called "guts"; perhaps found more often in women; perhaps more truly a spiritual factor, and closely linked with contentment and dissatisfaction in life. Why was one person knocked out of life by a trivial injury while another surmounted the most fearful handicaps? He agreed with Dr. Dicks that previous stress successfully overcome was a great strengthener, but to do this needed security.

Acting Spontaneously

Dr. R. F. BARBOUR (Bristol), speaking out of experience in child guidance, raised the question of the adult's preconceptions in their dealing with a child. How could mothers break through the child-rearing systems they had adopted and act spontaneously when necessary? They, as doctors, needed to question such assumptions as: Must a child be admitted to hospital, running the risk of damage greatly? Were green vegetables necessary for health? and so on. The level of the child's mental ability needed to be kept in mind, particularly so that a relatively dull child should not be forced to attempt too much. Parents should

reconsider their attitude to discipline—the admissibility of self-expression for the child, and the need of the child to develop independence.

Dr. DORIS ODUM (London) reported that recent evidence on adoption had shown that third-party adoptions arranged on adoption had been proving notoriously unsuccessful. Too by doctors had been proving notoriously unsuccessful. Too often such adoptions were not made in the interests of the child, but possibly out of a mistaken notion that a neurotic woman needed a child to make her well. Doctors must adopt a more responsible attitude to adoption and make the child's interests paramount. She added that the changing social pattern due to the emancipation of women had altered many women's readiness to devote their entire lives to their children. However, the 24-hour presence of the mother with the young baby was not absolutely inescapable; but undoubtedly many neurotic breakdowns had their roots in an insecurity of the basic home relationship.

Dr. F. A. BLVAN (Woodstock) had found as a rural general practitioner that a greatly disproportionate number of problems which came to him arose in that quarter of his own area which was really a dormitory suburb of Oxford and not a true village community. Here there were small families living remote from their relatives and with no secure social roots.

Dr. F. H. BODMAN (Somerset) particularly agreed with Dr. Dicks's remarks on immature character formation of parents. Dr. MacDonald's emphasis on stress at school was equally valid. A survey of Somerset children had had the interesting result that the highest incidence of maladjustment in schools was in the 5-6-year-old age group. This represented a measure of the child's failure to develop from his home ties, and it was an area in which mothers needed help. He deplored leaving too much responsibility on adolescents to choose their own careers, but agreed that reasonable stress was a character-building influence.

Dr. J. P. HORDER (London) thought that in these days of contracting responsibilities of general practitioners the field under discussion was one in which general practitioners could well expand, if only the problems of expenditure of time and of selection of "short cases" could be solved.

Dr. W. LINFORD L.L. REES (Cardiff) drew attention to the contribution of maternal overprotection to tensions. It was a paramount factor, for example, in asthma, and predated the symptom in 75% of cases. Parental guidance had good results.

Dr. DICKS in summing up the discussion said that training the child should be an automatic process in infancy and should become explicit only when the child could both understand and use language. In principle the balance should always be on the side of gratification rather than frustration of the child. One difficulty of the over-protective parent was that she was too insecure to say "no." In marital tensions it was notable how the sounder partner would consult the doctor first. Dr. Dicks re-emphasized that medicine is indivisible and that much could be done in the field under discussion by the general practitioner once he had acquired the necessary conceptual tools.

SECTION OF RADIOLOGY

Wednesday, July 15

Radiology of Congenital Heart Disease

The president, Dr. PETER J. KERLEY (London) took the chair and introduced Dr. R. E. STEINER (Hammersmith), who opened the discussion on the radiology of congenital heart disease. Dr. Steiner discussed the acyanotic forms of congenital cardiac anomalies, and, in his introductory remarks, stressed the need for complete radiographic investigation and the value of fluoroscopy. The varying patterns of the heart shadow and pulmonary vessels were described, and the importance of pulmonary plethora or ischaemia was stressed. Dr. Steiner gave a broad classification of acyanotic cases as follows: (a) cases with intracardiac shunt;

and (b) cases without intracardiac shunt. Of the first group, coarctation of the aorta, pulmonary stenosis, and patent ductus arteriosus were described in detail: mention was made of the rarer lesions of this group. Of coarctation, Dr. Steiner thought that venous angiography was necessary, not so much for diagnosis as for anatomical definition of the aortic constriction and of the condition of the adjacent aorta and subclavian artery. Pulmonary stenosis in its two main types was described and the value of angiography in diagnosis was emphasized. The radiographic appearances in patent ductus arteriosus were listed and the variability of the heart shadow in this condition was indicated.

Atrial and ventricular septal defects, which comprised a large part of Dr. Steiner's second group, were described in detail. The complicated septal defects presented problems in diagnosis, and the confusion that could occur between a large ventricular defect and the Eisenmenger complex required resolution at venous angiography.

Dr. T. H. HILLS (London) described the cyanotic forms of congenital heart disease. The indiscriminate use of angiography was deplored and the considerable number of fatalities that had occurred in angiography of cyanotic cases was mentioned. Team-work and planning could do much to obviate the dangers of the examination, but the most vital preventive measure was careful case selection. Continuous blood pressure and electrocardiographic recordings were necessary, and a thoracic surgeon and anaesthetist must be constantly available to carry out bronchial suction or cardiac massage should these measures prove necessary. Dr. Hills described the direct fluoroscopic appearances in Fallot's tetralogy at length, and stated that angiography was of value only where surgery was contemplated. Venous angiography as against selective angiography via a catheter was preferred on the ground that the hazard was less with the venous route. Where there were complicated lesions, angiographic interpretation was difficult and the relative timing of chamber filling was often needed in differential diagnosis. For this purpose the angiograms must be obtained at sufficiently short intervals. Tricuspid atresia was then discussed and the angiographic picture in these cases described as diagnostic. Dr. Hills stressed the comparative rarity of Eisenmenger's complex and the fact that a normal pulmonary blood supply might hinder recognition of this lesion.

Dr. J. NORMAN PATTINSON (London), in an occasional paper on the anomalies of the aortic arch, traced the development of the arch and its derivatives and proposed a simple classification of the anomalies encountered. He gave his own clinical experience with these lesions and pointed out the value of the simple procedures of barium swallow and tomography in diagnosis.

Technical Improvements

Dr. R. A. WILLIAMS (Newport, Mon) foresaw the need for technical improvements in angiography and hoped that the recently developed technique of image amplification together with cineradiography would allow the radiologist to obtain 25 frames per second. Dr. JOSEPH JACOBS (Cardiff) agreed with Dr. Hills that angiography had a circumscribed place in diagnosis. He pointed out the importance of left atrial enlargement in the diagnosis of patent ductus arteriosus and thought that this was one of the earliest signs of this anomaly. Mr. H. R. S. HARLEY (Cardiff) had found angiography of little help in the diagnosis of left-to-right shunts and of occasional value in defining abnormalities of the great vessels. In his opinion retrograde aortography was preferable in complicated cases of coarctation or patent ductus.

Dr. PETER J. KERLEY (London) demonstrated a series of pulmonary-vessel anomalies in asymptomatic adults which had been discovered at routine or mass miniature chest radiography. He believed the condition to be far commoner than was generally assumed.

Dr. J. MAURICE H. CAMPBELL (London) reported a large series of paired superior venae cavae seen over the past few years and thought that this condition was not uncommon.

Correspondence

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

Alcohol and Barbiturates

SIR.—Attention was drawn in your annotation (*Journal*, June 6, p. 1269) to the lack of information concerning the effects of ethyl alcohol and barbiturates taken together. Some clinical evidence exists that these two substances potentiate markedly the effects of each other. In addition, Billie and Ahlquist¹ reported that, in rabbits, alcohol potentiates the hypnotic effect of sodium pentobarbitone, and Ramsey and Haag² found that alcohol increased the toxicity

Doses of Sodium Amytal and Ethyl Alcohol Necessary to Produce 50% Mortality in Mice

Sodium Amytal 0 mg./kg.	Ethyl Alcohol 14.25 ml./kg.
200	11.5
350	6.5
500	4.75
675	0

of various barbiturates administered to mice. Experiments have been performed in this laboratory to determine the acute toxicity of sodium amytal and ethyl alcohol administered simultaneously.

Male albino mice weighing approximately 20 g. were used. Sodium amytal was administered orally as a solution containing 20 mg./ml., and ethyl alcohol (50 v/v in water) was given by the same route. The median lethal dose of each of these substances, administered alone, was determined. Subsequently the amounts of ethyl alcohol required to produce 50% mortality in mice which had been given approximately one-quarter, one-half, or three-quarters of the median lethal dose of sodium amytal were determined. The results of one typical experiment are shown in the Table and Graph.

When the results are plotted graphically with the dose of sodium amytal as ordinate and the dose of ethyl alcohol as abscissa, all the points lie on the straight line joining the median lethal dose of sodium amytal to the median lethal dose of ethyl alcohol. Therefore a synergism exists between sodium amytal and alcohol. However, the effects are simply additive and our results provide no evidence that the toxicity of sodium amytal is potentiated by alcohol.—We are, etc.,

G. A. H. BUTTLE.
H. J. FEARN.
J. R. HODGES.

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REFERENCES

- ¹ *J. Pharmacol.*, 1937, 61, 385.
- ² *Ibid.*, 1946, 88, 313.

Manual Methods in General Practice

SIR.—I like Dr. R. Barbor's article (*Journal*, July 4, p. 18), and I am sure that his patients are grateful too. We too easily forget how often mother "rubbed it and made it better." Her examination was less thorough—this did not matter much, because her patient already had faith in her.

Unfortunately there are many soft tissue "lesions" which more often than not fail to resolve spontaneously—for example, those of rheumatoid arthritis. When he turns to disk fragments that pop out and obligingly pop in again—and stay in—when the spine is moved this way and that, those of us who stand by scientific evidence and controlled experiment reluctantly draw back. When one has excluded such conditions as tubercle, ankylosing spondylitis, tumours, and recognizable trauma, there remain a number of syndromes, relating to the back and neck whose natural history is but poorly known. Here surely is a chance for general-practitioner research.—I am, etc.,

Sheffield.

H. F. WEST.

SIR.—Dr. R. Barbor is to be congratulated on his most interesting account of manipulation and accurate manual methods in general practice (*Journal*, July 4, p. 18). He does well to bring attention to the very real place these methods have in the treatment of those conditions he groups together as "soft-tissue lesions," and to describe the existing difficulties in obtaining physiotherapy for those of our patients who require it, when they require it.

I am surprised, however, at the high figure (17%) Dr. Barbor gives for the incidence of his patients requiring manual methods of treatment, while I feel that he has over-simplified the diagnosis and choice of treatment. I agree that manipulation may be of value in some cases of prolapsed intervertebral disk, but I would not dare manipulate any patient's spine without first seeing radiographs in order to exclude a lesion other than the simple mechanical one in question. I have seen in the last two years a young man whose backache could easily have been diagnosed as a "minor disk lesion" and manipulated—he had a tuberculous lesion in the first lumbar vertebra. Another patient's backache was due to a secondary carcinoma, even though there was at that time no evidence of a primary growth anywhere. This patient also could easily have been mistaken for a case of "lumbago."

In order to compare my own experience with that of Dr. Barbor I have checked through a survey of the patients I saw during the last six months of 1951 in my own practice. Only 5% of the total number seen in that time were suffering from "soft-tissue lesions." The accompanying table shows their incidence according to sex and diagnosis.

Diagnosis	Male	Female	Total
Joints:			
Ankle, acute inversion strain	2	—	2
Elbow, "tennis"	1	—	1
Intervertebral—prolapsed disk	2	6	8
Knee, ruptured medial meniscus	3	—	3
Sacro-iliac, acute subluxation	—	1	1
Stero-clavicular, subluxation	—	1	1
Muscles:			
Contusion to fore-arm	1	—	1
Contusion to thigh	1	1	2
Contusion to chest wall	1	—	1
Multiple muscular pains	—	4	4
"Pulled" sacro-spinalis	1	1	2
Ruptured plantaris	—	1	1
"Stiff neck"	—	3	3
Tendons:			
Partial rupture supraspinatus	1	—	1
Ruptured extensor indicis ("mallet" finger)	—	1	1
Traumatic tenosynovitis at wrist	1	2	3
Total (percentage of total number of patients seen)	13 (4.2%)	22 (5.4%)	35 (4.8%)

Of this small number, only five were thought to be fit for manipulation: three with acute "stiff neck," one with "tennis elbow," and one with acute subluxation of the left sacro-iliac joint. All but one were completely relieved by one manipulation. The patient with the tennis elbow required one further treatment. Of the eight patients in whom some degree of disk prolapse was diagnosed, six were seen by a consultant orthopaedic surgeon. Two of them were so severe that they did not respond to rest or plaster jackets, and later required surgical treatment. At operation both showed a condition which would have defied any manipulation. The others recovered with rest in bed (four) for periods from two to six weeks, or in plaster jackets (two).

During this time I saw several other patients with "backache," but in view of the complete absence of physical signs they were not treated as "soft-tissue lesions." A brief history of one of these demonstrates the efficacy of psychotherapy. A 30-year-old woman had had low backache for over a year. She had attended two hospitals, and had been seen by orthopaedic surgeons, neurologists, and physical medicine experts. All types of treatment had been tried, including manipulations. She was told radiography showed no abnormality, but still her backache persisted. When I asked her to describe to me when and how the pain had started she was silent. Following much encouragement she "confessed" that the backache started the day after she had permitted her fiancé sexual intimacy. She felt she had sinned terribly—she "deserved her punishment." After an hour's discussion she said she felt better, and when seen a fortnight later she was able to tell me that she had been free from the backache for the whole time. She is still well.

Here, then, lies the danger in physical methods of treatment. Underlying psychogenic causes may be left undiscovered and patients left to suffer in spite of all efforts to help them. Dr. Barbor is right to emphasize the importance of accurate diagnosis, and of the need for preliminary careful examination. It is left only to stress that this should be of the whole patient and not just the part that hurts.—I am, etc.,

PHILIP HOPKINS.

Hampstead, N.W.3.

SIR.—Dr. R. Barbor is to be congratulated on his presentation of manipulation and accurate manual methods in general practice (*Journal*, July 4, p. 18). The attainment of accurate diagnosis and treatment in the all too frequent patient suffering from "rheumatism" or "fibrositis" is highly desirable. To have one's own St. Thomas's trained physiotherapist to treat these cases must be indeed satisfactory.

There are, unfortunately, many factors which preclude such an ideal set-up. The first is the general practitioner's interest in these cases. This is of necessity the preliminary requirement, as everything else will follow to a degree. The second of importance is his ability to acquire sufficient experience in this wide field. The majority of us live far away from London. The need of learning such detailed knowledge so that it can be applied quickly and methodically in a busy surgery is obvious, and it can only be learnt from a teacher of such merit as Dr. Cyriax. Until it is possible for the general practitioner to acquire the necessary experience this rich field of manipulation and manual treatment will be sadly neglected. Perhaps it would not be too much to ask to have several two-week courses at St. Thomas's included in the list of G.P. refresher courses. This seems the only satisfactory way to enable many doctors to get the experience they desire.

I would like to associate myself with Dr. Barbor and add that my experience during the last four years has been greatly enriched by being able to give these patients a diagnosis, treatment, and advice which is, on the whole, not only accurate and lasting but also surprisingly well appreciated.—I am, etc.,

TREVAN HAMBLY.

Ryde, I.O.W.

SIR.—Dr. R. Barbor's article on the physiotherapy arrangements in his practice (*Journal*, July 4, p. 18) was most stimulating to the ideal of family practice and damning to the hospital clinic. The physical medicine arrangements in this area have the same limitations owing to transport difficulties and lack of supervision in hospital. This gap in the N.H.S. hospital facilities was pointed out to the regional board two years ago. The gap was filled in one parish by using surplus funds from the old Nursing Association to pay a St. Thomas's trained physiotherapist. It was an entirely parochial idea.

However, Dr. Barbor does not make it clear whether his firm employs the physiotherapist and charges the patient, or whether the patient pays her direct. I hope it is the former, with the executive council's approval, as this will be the thin end of the inevitable wedge: the efficient N.H.S. practitioner providing better service for his patients than can the hospital, and repaying his capital outlay by charging for the service legally.—I am, etc.,

ROBERT HOWARD.

Burley, Hants.

Cerebellar Dysfunction

SIR.—I was interested in Dr. Basil Seltzer's medical memorandum on a case of glandular fever presenting as cerebellar dysfunction (*Journal*, July 11, p. 83). On reading the case report, however, I could find no evidence which would support a view that Dr. Seltzer's patient did in fact suffer from cerebellar dysfunction. The term ataxia is not synonymous with cerebellar affliction and should be specified—for example, sensory, vestibular, or cerebellar—after appropriate physical signs have been elicited to establish the type of incoordination.

Later in the report it is stated that there were no sensory disturbances in the arms and legs, followed by: "Romberg's sign was present." This is contradictory, since Romberg's sign, if any specific significance is to be attached to it at all, depends on dysfunction of proprioceptive sensibility. Hence this sign is present in sensory ataxia—for example, tabes dorsalis or polyneuritis—and is not a feature of the cerebellar type of ataxia (although here, too, as in nervous or intoxicated patients, the sign may be present).

This misconception of the significance of Romberg's sign and the unspecified use of the term ataxia are often encountered, and I have recently seen an instructional medical film spoiled by this blemish on the authority of its producers.—I am, etc.,

Sheffield.

JAMES O. NEWMAN.

Post-inoculation Poliomyelitis

SIR.—Dr. J. Grant (*Journal*, July 11, p. 66) concludes his article with the statement that "there was no doubt of the increased risk to a child of developing a paralytic attack of poliomyelitis as a result of intramuscular immunizing injections at a time when poliomyelitis was prevalent." The evidence presented is that 3 out of a group of 354 recently inoculated children developed poliomyelitis compared with 9 out of 2,743 uninoculated children in the same age range. This difference in attack rates is not statistically significant.

Thus there does not seem to be any firm evidence here to show that recent inoculation has produced additional cases of paralysis. On the other hand, there is clear evidence in this and other inquiries that the distribution of paralysis sites among recently inoculated children differs from that in those not recently inoculated. Examination of the distribution of paralysis sites for inoculated and uninoculated children as given by Bradford Hill and Knowlton¹ suggests that at any rate the main effect of recent immunization is to add an additional paralysis site.

Taking the paralysis sites for, say, 100 uninoculated children and adding to them the immunization sites for 100 children (given elsewhere by Gray and Cartwright²), except where by chance the two sites would coincide, one arrives at a distribution of sites closely in agreement with the paralysis sites for 100 recently inoculated children. Furthermore, the number of paralysis sites per child as calculated in this way shows good agreement with the number found in the recently inoculated children. It is perhaps worth noting that this hypothesis does not preclude the occurrence of paralysis only in the injected limb. This would occur by chance in a proportion of cases.—I am, etc.,

P. G. GRAY.

London, W.C.1.

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- ² *Monthly Bull. Minst. Hlth (Lond.)*, 1952, 11, 26.

Bornholm Disease

SIR.—General practitioners should read the articles in the *Journal* of June 20 on Bornholm disease with great interest, for this illness presents a diagnostic problem which, if not kept in mind, could give rise to considerable difficulty and might lead to the uneconomical occupation of both surgical and medical beds. One's main reaction to these articles is of gratification for the simplification of yet another symptom complex. The elucidation of the epidemiology and symptomatology of many virus infections has often fallen to

the lot of the general practitioner, for few of the sufferers from them reach hospital. That we are now in a position to understand more clearly the symptomatology they present is due to the team work of practitioners, public health workers, and specialists, and of course the outstanding work of Dr. Pickles.

Appreciating the symptomatology of Bornholm disease, influenza, benign lymphocytic meningitis, and non-paralytic poliomyelitis, to say nothing of the varied symptomatology of mumps and other virus diseases where the organism may show a predilection for the cerebrospinal system¹ and the gonads, the practitioner must become aware of the widespread and often unrecognized prevalence of virus infections in his own practice during the summer months.

In a rural practice centred on a small town I find there were, spread over the month of June, 13 cases of probable virus infections. Ten of these presented with an acute febrile illness lasting about 48 hours, the main symptoms being severe headache, vomiting, malaise, and some abdominal pain. Eight came from the same small housing area and the two others from the same school. Only three were female, and all were under 35 years of age. In the week when most of these patients were seen six cases of acute diarrhoea and vomiting occurred in the same housing area—perhaps owing to a similar infection, for their illnesses were just as short and sharp. The only other virus infections seen in the practice during that period were two cases of infectious hepatitis from two miles away, and, next door to them, a boy from the same school as the others developed acute vomiting, malaise, and headache. It is tempting to trace a link between all these cases.

These personal experiences and those of previous summers suggest that virus infections are relatively common in general practice at this time of year and that they crop up in various forms. I am sure that the investigation of the relationships of these forms provides in the work of the general practitioner a subject of great interest.—I am, etc.,

Lockerbie, Dumfriesshire.

JOHN WILSON.

REFERENCE

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Proctalgia Fugax

SIR,—The article by Mr. M. R. Ewing on proctalgia fugax (*Journal*, May 16, p. 1083) raises several points of interest, and I would like to make one comment on the symptomatology and another on therapy.

I have had diurnal and nocturnal attacks for some years, and the former are always the more severe. Whereas the nocturnal attacks never progressed beyond the pain as described, the diurnal attacks always went on increasing in severity for about 10 minutes and invariably ended in drenching perspiration, violent nausea or vomiting, extreme pallor, bradycardia, and, perhaps once in three times, syncope. The whole attack from beginning to end would last about half an hour. These attacks were not frequent, but sometimes happened during an operating session and would occasion considerable distress. I also suffer badly from travel sickness (unless I drive the car myself), and if very tired a long cross-country bus ride or a fast journey on winding roads downhill would induce the complete vaso-vagal syndrome as described. I found that amphetamine taken before a journey, or even if only taken when the symptoms first made themselves apparent, would abort an attack with certainty. I then applied this same treatment to the attacks of proctalgia, hoping that it might relieve the complicating symptoms, and to my very considerable delight I found not only that the vaso-vagal symptoms were entirely controlled but the pain itself rapidly subsided.

I had suspected that perhaps a hypoglycaemia was responsible for the attacks and that it induced both the muscle spasm and the vagotonic state, but I could never prove that this was so, and, although the treatment described by Mr. Ewing might at first sight suggest that hypoglycaemia was a factor in the aetiology of the attacks, the speed of recovery probably rules out the elevation of the blood sugar as the factor aborting an attack. This also follows, of course, if taking a glass of cold water is equally effective as food. Mere swallowing is quite definitely not enough, for the salivation induced when the attack has developed, and which occasions much swallowing, only aggravates the nausea. It would be interesting to hear if others also find relief by the taking of amphetamine.—I am, etc.,

Shillong, Assam.

R. ARTHUR HUGHES.

Deceptive Acute Abdomen

SIR,—We would like to add a few remarks in answer to the letters by Drs. S. A. Gueukdjian (*Journal*, July 4, p. 42), and E. Saphier (*Journal*, July 4, p. 46). In this hospital where there are both surgical and infectious diseases units working in close co-operation, we see many cases of acute appendicitis in children which have been sent in under other diagnoses.

Such a case as that reported by Dr. Gueukdjian is by no means uncommon. Mild symptoms and minimal physical signs occur in children even at the age of 14, and it has long been known that is a waste of time trying to correlate them with the degree of the pathological changes. This is perhaps even more so in those of our cases who develop pain in the right iliac fossa during an attack of measles or chicken-pox. The differential diagnosis in these cases between acute appendicitis and lymphatic glandular enlargement is extremely difficult. Many examples could be quoted, but one that stands out particularly is a child of 5 years who had been suffering from chicken-pox for five days. He developed a slight pain in his right iliac fossa but this did not stop him from eating, two hours before admission, a good meal of fish and chips. He, too, had a general peritonitis and a perforated gangrenous appendix.

We are also in entire agreement with Dr. Saphier. Acute appendicitis may be a complication of gastro-enteritis (it is more often misdiagnosed as such), and pain in the right iliac fossa occurring in a case of "gastro-enteritis" demands extra special care and caution on the part of the examining doctor. We are, etc.,

A. G. ELLERKER.

H. E. PARRY.

London, N.W.3.

The Post-operative Chest

SIR,—I think Dr. W. S. Davis (*Journal*, July 11, p. 97) has misread my letter (*Journal*, June 20, p. 1388). I did not suggest that anaesthetists could prevent post-operative chests. To do so would be to carry flattery beyond all reasonable bounds. Nor did I venture to discuss the aetiology of these conditions, and I am sure that Dr. Davis is right in everything he says about the mechanics of respiration. I did, however, try to emphasize that the immediate prognosis of the post-operative lung complications of general surgery is excellent, and to underline the findings of a previous contributor, which suggested that the remote prognosis is equally good. In fact, it is practically impossible to stop them getting better.

I hope I may be forgiven for saying that anaesthetists are apt to dogmatize on this subject whilst keeping at such a respectful distance from the wards that their patients are usually quite unaware of their identity. On the other hand, surgeons, especially the whole-time variety, often have nothing better to do than wander about looking at their patients, and are apt to see them at frequent intervals. Having done this for a number of years, one cannot escape the conclusion that pyrexia persisting for more than a few days after operation is invariably due to something other than an acute lung complication. Usually it is found to be due to a wound infection or residual abscess, but in a significant number of cases x-ray examination of the chest discloses unsuspected tuberculosis, and one is entitled to wonder if tuberculosis is sometimes disseminated in the operating theatre. There is something incongruous in the sight of an apparently healthy anaesthetist covering his own face with a quite ineffective gauze mask while allowing a succession of patients to breathe in and out of a filthy rubber bag.

I have no objection to encouraging the patients to cough, but, as cough is one of the symptoms of a post-operative chest, one is rather in the position of preaching to the converted. It is certainly true that coughing is painful for a few days, and equally true that the pain soon passes off.

An x-ray examination of the chest soon after an abdominal operation almost invariably shows some areas of collapse, and I cannot share Dr. Davis's anxiety about his patient who left hospital feeling perfectly well but unaware that part of her lung had not yet expanded fully. I'm sure it has by now.—I am, etc.,

Barnet.

V. J. DOWNIE.

Possible Sequel of Treating Infants in the Erect Posture

SIR,—I am interested to read Professor John Craig's suggestion (*Journal*, July 11, p. 98) that the shape of the skull of infants who have been treated for hiatus hernia by being placed in the erect posture may be affected by such positioning. I have not observed this, but it has occurred to me that prolonged treatment in the erect posture may lead to some disturbance of the normal growth of the pelvis. The plaster chair designed by Dr. Hill and described by her in the *Lancet* (1953, 2, 71), in so far as it leads to immediate control of the vomiting, is of great value. But in its construction there is no device whereby the weight of the infant's body is kept off the soft bones of the pelvis. Are we encouraging the development of further problems for the next generation of obstetricians?—I am, etc.,

Birmingham.

FRANCES BRAID.

Time of Eruption of Permanent Teeth in British Children

SIR,—The opening statement in the article by Drs. E. M. B. Clements and E. Davies-Thomas and Miss K. G. Pickett (*Journal*, June 27, p. 1421), that the most recent study on this subject was in 1925,¹ in my opinion appears not quite correct. In 1951 an original communication appeared in the *British Dental Journal*, on "Time of Eruption of Permanent Teeth and Shedding of Deciduous Teeth," by Stones *et al.*² The children examined were from the National Children's Home, Frodsham, near Liverpool. Although British nationality was not specifically stated, there was nothing in this paper to suggest otherwise.—I am, etc.,

A. SANDER.

Essen Kray, B.A.O.R.4.

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² *Brit. dent. J.*, 1951, 90, 1.

Controlled Respiration and Apnoea in Anaesthesia

SIR,—In reply to Dr. Gordon M. Wyant's letter (*Journal*, June 13, p. 1334), in which he says apnoea is an unphysiological state, the answer is, surely, that anaesthesia itself is "unphysiological." Apnoea, with adequate manual ventilation, gives a more desirable physiological state than that following half-way measures of relaxation induced by either the muscle relaxants or general anaesthesia alone. Any degree of relaxation produced by an agent such as succinylcholine must result in a concomitant decrease of respiratory movement, reduced tidal volume, and the tendency to carbon dioxide retention.

A continuous intravenous infusion of a dilute solution of succinylcholine to give relaxation for tracheal intubation, as advocated by Dr. Wyant, seems both time-consuming and unnecessary. Does it really matter that a patient is given 40 mg. rather than 20 mg. of succinylcholine to achieve relaxation, when the higher dose in the more sensitive patient produces no untoward effects? Need one worry if the period of apnoea following a single injection of succinylcholine is 30 seconds, or 5 minutes, or even 10 minutes? I believe it is better to achieve complete relaxation knowing that passive inflation will be required than to risk "bucking" and possible trauma with intubation as well as having to assess whether assisted respiration is required.

Finally, in reference to Dr. Wyant's point of semantics, the definition of "controlled respiration" given by him ("that state wherein spontaneous respiration has been abolished by means of hyperventilation . . . and a varying degree of central respiratory depression, but in which spontaneous respiration will resume soon after manual ventilation has been discontinued") was made before the advent of muscle relaxants. However, when a patient is rendered apnoeic by one of these relaxant drugs and the anaesthetist takes over ventilation, he is said by Dr. Wyant to be instituting "artificial respiration" but not "controlled respiration."

The term "artificial" can be applied to both situations. Similarly, since the expression "controlled respiration" as generally used covers all techniques by which the anaesthetist can control at will the patient's tidal volume and respiratory pattern, a student of semasiology might well accept this broader meaning of the term which has arisen to include more recent developments. Whether or not the anaesthetist shows a singular lack of control by being left to "hold the bag" at the end should not affect the definition.—I am, etc.,

London, S.W.3.

TREVOR T. CURRIE.

SIR,—Please allow me to preface my remarks by saying that I am well aware of the benefits to the patient that may result from controlled apnoea in anaesthesia in certain cases, and that I fully appreciate the debt owed by all anaesthetists to the Liverpool school. Nevertheless, the letter from Drs. G. Jackson Rees and T. Cecil Gray (*Journal*, July 11, p. 97) must compel a few critical observations, and I hope your correspondents will accept these as an old-fashioned but well-intentioned dose of sweet vitriol.

Dr. Gordon M. Wynant (*Journal*, June 13, p. 1334) and Professor E. A. Pask (*Journal*, May 9, p. 1048) are taken to task for suggesting, in their reactionary ignorance, that apnoea in anaesthesia may not always be beneficial to the patient, and Dr. Wynant is said to have used the term "unphysiological" loosely. It is only reasonable and humanitarian, I think, to state that patients requiring anaesthesia for a wide variety of pathological conditions may not invariably be ideal subjects for revolutionary technical exercises, physiological or otherwise.

I doubt if I am being unjust to Drs. Jackson Rees and Cecil Gray when I quote in its entirety point (2) in the last paragraph of their letter: "Many in the vanguard of modern anaesthetic progress still maintain a regard amounting almost to superstition . . . for the authority of the 'old-fashioned' anaesthetist. We are not, however, prepared to believe that the virtue of being old-fashioned gives any doctrinal authority in respect to the matters under discussion." "The vanguard of modern anaesthetic progress" is a good phrase unless one reads the word "anaesthetic" in its meaning of "unfeeling." Still, a position of self-acknowledged leadership must be very reassuring. I wonder how many protagonists of the wholesale use of hypotension in anaesthesia not so long ago wrote letters and papers in an equally hubristic and dogmatic mood, and how many of that advance party are now fighting rearguard actions—with their own consciences.—I am, etc.,

Chesterfield.

ANDREW G. HEGARTY.

Medical Semantics

SIR,—The article by Dr. Ffrangcon Roberts on medical semantics (*Journal*, June 27, p. 1444) must have been read with much interest, not only by members of the medical profession but also by many non-medical men who, like myself, have to read widely in the medical literature. He has compressed much information into a short space, but there are one or two points which call for comment.

Dr. Roberts asserts that *mater* is derived from the Arabic word for *mother*. I am informed that the word for *mother* in Arabic, at least as spoken at the present day in Egypt, is *umm*. Even if a different word is used in other dialects, or was used in the Arabic of the Middle Ages, *mater* is undoubtedly the Latin word for *mother* (from the Greek *μητηρ*) and it would be interesting to know on what evidence Dr. Roberts dismisses this derivation. Neither the *Concise Oxford Dictionary*, nor the *American Illustrated Medical Dictionary* (Dorland), nor *Stedman's Medical Dictionary* gives any support for this. All these works of reference likewise derive *basilic* and *cephalic* (as applied to the veins of the arm) from the Greek. *Basilic* is also used in the sense of *chief* or *important* in other connexions. Dr. Roberts's suggestions are ingenious, but more definite evidence would be needed before accepting them.

Dr. Roberts also makes the curious statement that the Germans lived too far north to be in the stream of classical culture. A glance at the map will show that a large part of Germany lies farther south than the British Isles, but perhaps he meant to write "too far east." In any case, Latin has been widely studied in Germany for centuries and French was once the language of the courts. At the present day, most German doctors have a more thorough knowledge of Latin than their English colleagues, and, whereas in English medical writings the Latin terms are often anglicized, in German the original Latin is usually employed.

In order to illustrate the clumsiness of the German vocabulary it is scarcely fair to compare *Zwölffingerdarmgeschwür* and *Wurmfortsatzentzündung* with duodenal ulcer and appendicitis. It would be correct to compare *Zwölffingerdarm* and *Wurmfortsatz* with duodenum and appendix; but when compared in this way the difference in length is no longer very great. The fact that in German two words forming a single idea are joined together to form one word has nothing to do with the argument. Incidentally, *Entzündung* is the normal word for inflammation, so why translate it as *burning*, whatever its derivation?

The fact of the matter is that for most parts of the body, both in German and in English, the common names, usually of Teutonic origin, exist side by side with the medical names derived from Latin or Greek. It so happens that English has no words of Teutonic origin corresponding to *duodenum* and *appendix*, whereas German has (though *Wurmfortsatz* is not in popular use, appendicitis being colloquially but incorrectly referred to as *Blinddarmentzündung*). The German words for most parts of the body are no longer than, if as long as, their English equivalents—for example, *Kopf*, head; *Magen*, stomach; *Darm*, intestine (gut); *Niere*, kidney; *Auge*, eye; *Bein*, leg; to say nothing of the many words which are almost identical. Even when we come to the more medical terms, *Blutbildung* is not as clumsy as *haematopoiesis* (now shortened to *haemopoiesis*), *Schnecke* is just as simple as *cochlea*, and *Erreger* is far more convenient than *offending organism*.

I am not making a plea for the use of more German terms in medicine, and I have no doubt Dr. Roberts could produce a further list of comparisons to counter mine (so could I). My point is that the scarcity of German medical terms in English has nothing to do with their clumsiness or otherwise, and I think it a pity Dr. Roberts dragged this red herring into his instructive article.

In conclusion, may I support Dr. Roberts in his suggestion that the ligatures æ and œ should be abolished? As he says, we have already dispensed with them in many words in everyday speech. Some medical journals have made a start by writing *etiology* instead of *aetiology*, and *pediatrics* is becoming increasingly common; so why cannot we have *anemia*, *hemoglobin*, *fetus*, and *celiac*? Perhaps, Sir, you would give us a lead.—I am, etc.,

Ariesheim, Switzerland.

A. M. WOOLMAN.

Iron Therapy

SIR,—May I please make the following comments on the article of Dr. D. Haler (*Journal*, December 6, 1952, p. 1241)?

The opinions given so far about the utilization of various iron salts have to be regarded with caution, because all investigators did not consider two important facts: (1) The age of the investigated persons. Rechenberger¹ proved that the absorption of iron strongly diminishes with increasing age. In fact, it practically stops above the age of 50. But neither Dr. Haler nor Gram and Leverton² consider the age of their patients. Dr. Haler says that "the cases were selected at random," and the latter investigate 83 women between the ages of 18 and 42. (2) The influence of the different meals taken with the iron. L. M. Sharpe *et al.*³ showed that the absorption of iron is 30% less when given with

milk than it is when given with a sip of water, 65% less if given with oats in milk, and 85% less when it is taken with a regular breakfast. Besides the phytic acid which is to be found in a remarkable quantity in wholemeal bread, oats, maize, and nuts,⁴ other chemical and physical influences, among them the size of the meal, are responsible for reduced absorption of iron. Unfortunately, these facts also have not been considered so far by the investigators.—I am, etc.,

Berlin-Dahlem.

CURT H. SCHWIETZER.

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- ² *J. Lab. clin. Med.*, 1952, 39, 871.
- ³ *J. Nutr.*, 1950, 41, 433.
- ⁴ McCance, R. A., and Widdowson, E. M. (1935). *Biochem. J.*, 29, 2694.

Claims for Negligence

SIR,—I would like to reply to the letter from Dr. W. E. Hick (*Journal*, July 4, p. 44). The application of the doctrine of *res ipsa loquitur* is very difficult to follow, and even if it is applied in accordance with the definition contained in the first paragraph of your legal correspondent's article (*Journal*, June 20, p. 1398) or any other definition, the persons to be satisfied are the jury, the "reasonable laymen" referred to by the various Lords Justices. The leading case on *res ipsa loquitur* is that of a barrel rolling out of an open doorway on the upper floor of a warehouse and falling on the head of a passer-by in the street below. I am sure that any jury would be convinced that such an accident would not have happened if proper care had been taken.

It is difficult, on the other hand, with all respect to the Court of Appeal in the Cassidy case, to see how a jury could reach a similar decision regarding the after-effects of an operation for Dupuytren's contracture (which Mr. Cassidy had undergone) without possessing the appropriate special knowledge.—I am, etc.,

Liverpool.

NIGEL RYLAND,
Legal Adviser,
Liverpool Regional Hospital Board.

Electroconvulsive Therapy

SIR,—It is sometimes difficult to tell whether or not a stimulus of convulsive strength has been given after a relaxant has been injected. Drs. E. Thomas and B. F. Honan (*Journal*, July 11, p. 97) use the immediate contraction of the pupil as a sign that a subconvulsive dose has been given. They do not state which apparatus they use for the stimulus. With the Ediswan machine an immediate contraction of the pupil occurs both with adequate and with subconvulsive doses. This is in all cases followed by a dilatation lasting a second or so. The pupil then begins to contract and dilate rhythmically, with an accompanying suffusion of the conjunctivae.

In an article in the *Journal* of January 24 (p. 195) Dr. Max Hamilton and I suggested that this oscillation of the pupil was a sign that a "fit" had taken place. It now seems that this occurs with smaller stimuli as well. The method which we then described, that of blocking one limb from the effects of the relaxant and observing the convulsion therein, is very reliable and can be used with safety as a routine if it is desirable to control the stimulus accurately.—I am, etc.,

Epsom.

DAVID J. ADDERLEY.

Reaction to Blood Transfusion

SIR,—May I add to the literature another case of alarming reactions to the transfusion of blood in the absence of any demonstrable incompatibility?

A patient was referred to me by his own doctor for the surgical treatment of a long-standing "bleeding" duodenal ulcer. The patient looked anaemic. The haemoglobin content was 62%. The blood group was B, Rh negative. Rh-negative blood was

The Role of the Pathologist

SIR,—We feel the time has come to make a further protest at the new role the pathologists appear to have assumed—that of self-appointed judges and jury of their clinical colleagues. Rarely does a day pass by without a report appearing in the national press of yet another pathologist's criticism of the management of a case which he himself has only seen at necropsy.

Are we to assume that the pathologist is not only an expert in his own sphere, but also an infallible clinician as well? Without even seeing or examining the patient during life he is able to prescribe treatment for cases which, in his considered opinion, have been mismanaged by able physicians and surgeons.

We submit, Sir, that pathologists should be confined to a statement of facts and, at the most, an expression of opinion as to the cause of death.—I am, etc.,

M. GOLDMAN.

D. H. MILLER.

Southport.

Treatment of Accidental Poisoning

SIR,—With regard to Professor John Glaister's article in the Refresher Course series, on the treatment of accidental poisoning (*Journal*, May 30, p. 1214), I am surprised that no mention is made of the use of intravenous picrotoxin in the treatment of barbiturate poisoning. I have found that with an adequate dose of the 0.3% solution given in divided doses of about 5 ml. up to 20 or 30 ml. a comatose patient can become restless and sufficiently conscious to be made to vomit without risk, and subsequently to take a good dose of Epsom salts without risk or complaint. This avoids the sometimes difficult task of gastric lavage and possibly the necessity for hospital treatment.—I am, etc.,

Brighton.

R. S. SAXTON.

POINTS FROM LETTERS

Cartridge Syringes

Dr. GEORGE MOGEY (Leeds) writes: With reference to the question and answer on the above subject ("Any Questions?" *Journal*, June 27, p. 1459) . . . these syringes have one great advantage which, perhaps because it is so obvious, I have not seen mentioned. It is the simplification of aseptic precautions. The only parts which need to be sterilized by the doctor are the cartridge diaphragm, the needle mount with its prong for piercing this diaphragm, and the needle. The producers say they are considering the issue of a sterile container for about half a dozen needles and mounts: sterilization by boiling could be achieved in the surgery before the round and the needles carried in safety until required. Until the present such equipment has been a luxury, but if, as is claimed, the cartridge costs no more than conventional single-dose ampoules, it is likely to become popular. If the demand becomes great one can expect more and more manufacturers to compete in the sale of both the glass cartridges and the metal holders. Before this happens, may I plead for uniformity in the size of the glass ampoules, so that any cartridge may be used in any holder? The 2-ml. ampoule, already well established in dental practice and for which a number of holders are available, would appear to be the most suitable. Diameter of the cartridge is, however, of greater importance than length or volume from the point of view of standardization.

Peptic Ulcer in Women

Mr. P. A. LANE ROBERTS (London, S.W.15) writes: Dr. T. Csato (*Journal*, July 11, p. 95) contends that the absence or disappearance of peptic ulcer symptoms during pregnancy is the most impressively unequivocal coefficient in the natural history of the condition. One swallow does not make a summer, but at least Dr. Thomas Hodgkin would have had reason to dispute this statement. In his *Lectures on the Morbid Anatomy of the Serous and Mucous Membranes* (1840, Vol. 2, p. 371, London) he described the appearances of a typical lesion, and then cited only one case, which he evidently considered representative: "One well-marked case of ulceration occurred in a young woman whose vomiting commenced on her becoming pregnant and continued uncontrolled till about the fourth month, when she died."

cross-matched for the patient. One pint (568 ml.) of blood was administered during an operation for partial gastrectomy. As the ulcer was adherent to the pancreas the operation was unusually long owing to the difficulty of getting below the ulcer before transecting the duodenum. It was considered, therefore, advisable to give a second pint (568 ml.) of blood post-operatively. When the bottle containing the blood was practically empty, the patient collapsed. He was covered with sweat and his pulse was almost imperceptible. He complained of a pain in his back but there was no blood in the urine. Dextran was substituted for blood. The following morning he was jaundiced, although the stools retained their normal colour. He had double vision, was completely unconscious of his surroundings, and was very restless. His physical condition, however, was much better. Dextran was continued for another 12 hours. After that the patient was able to take water and glucose drinks by mouth. He remained disorientated and restless for several days. His jaundice has now completely disappeared and his mental condition and vision are restored to normal.

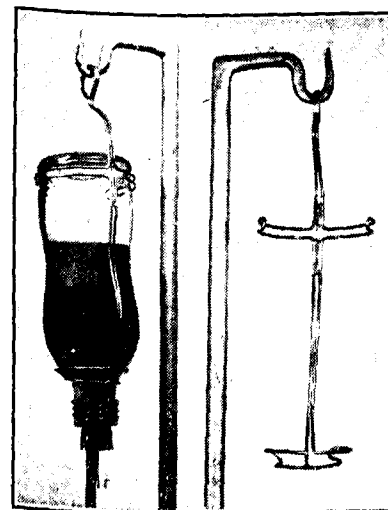
Two points are well worth noting—the recovery of the patient in spite of the large amount of blood administered, and the presence of cerebral phenomena, which were absent in the cases quoted by previous correspondents on this tremendously important subject.—I am, etc.,

Kildare.

D. J. CANNON.

Frame for Standard Blood Bottle

SIR,—The accompanying photographs show a wire frame made to my design by my technician, Mr. R. T. Miller, to accommodate the standard bottle of blood.



The ordinary loop which clips on to the bottom of the bottle is seldom sent to the operating theatre, and the clips kept in the theatre break very quickly where they are bent over. The frame illustrated is made of brass wire, which has some spring in it, and the bottle simply needs pushing into this frame, which can be hung on to the drip

stand. It can easily be made by the technician on the spot at the cost of a shilling or two, and should save the transfusion service a considerable amount of money in clips.

The photographs were taken by Mr. E. J. Pamey, the hospital photographer.—I am, etc.,

Northampton.

F. F. WADDY.

Eosinophil Content of Spleen in Addison's Disease

SIR,—The role of the spleen in the removal of eosinophils from the blood stream is being investigated in this laboratory, and I would like to know more about the content of eosinophils in the spleens of patients who died from Addison's disease of the adrenals.

As such necropsy material is becoming uncommon, I would appeal to my fellow pathologists who possess tissues from cases of Addison's disease to send me a small piece of spleen in fixative. Relevant details would be appreciated, including the age and sex of the patient, interval between death and necropsy, cause and duration of the disease, and whether or not the patient had been treated with cortisone or deoxycortone.—I am, etc.,

Birmingham Accident Hospital,
Bath Row, Birmingham, 15.

S. SEVITT.

Obituary

W. FRANCIS ELLIS, C.M.G., O.B.E., M.R.C.S.

An interesting career, which could be divided roughly into two parts, ended on July 11 with the death at Tangier of Lieutenant-Colonel W. Francis Ellis at the age of 75. William Francis Ellis was born in 1878, the fourth son of the late W. H. Ellis, J.P., of Shipley Hall, Yorkshire, and was educated at Bradford Grammar School and at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1901. In the following year he entered the R.A.M.C. and immediately saw service in South Africa, gaining the Queen's medal with five clasps.

When war broke out again in 1914 Ellis served successively in France, the Dardanelles, and in Palestine, and was four times mentioned in dispatches. In addition he qualified for two campaign medals as well as the 1914 Star. He was appointed O.B.E. in 1919, when he held the rank of major (acting lieutenant-colonel), and later in the same year he received the brevet of lieutenant-colonel, with which rank he retired from the R.A.M.C. in 1924. During most of the 22 years he was in the Army Colonel Ellis worked as a surgical and ophthalmic specialist.

On retiring from the Service he settled in Tangier, and there he turned to journalism and politics. For many years he was *The Times* correspondent for the territory, and he did much good work as a member of the Tangier Port Commission, and as British vice-president of the International Legislative Assembly from 1925 to 1940 and again from 1945. During the whole of the last war he was press attaché to the British Consulate General, in which capacity his experience as a journalist proved of great value. His services were officially recognized by his appointment as C.M.G. in the 1945 New Year Honours List. Colonel Ellis married three times. He is survived by his widow, a son, and a daughter.

ROBERT GEORGE HOGARTH, C.B.E., F.R.C.S.

We are indebted to Dr. J. WILKIE SCOTT for the following appreciation of the late Mr. R. G. Hogarth, whose obituary notice was printed in the *Journal* of July 4 (p. 47):

Mr. R. G. Hogarth at the time of his death was the doyen of the medical profession in Nottingham. The subject of his presidential address to the Nottingham Medical Society over 30 years ago was "Notable Doctors of Nottinghamshire." Many famous names were included; in any such roll in the future his own will assuredly be given high place.

His career in Nottinghamshire was an outstanding one, and of no one could it be more truly said that he had the ball at his feet from the start. He was accustomed to say that he owed his appointments as house-physician and house-surgeon at St. Bartholomew's to his prowess for the hospital at football, cricket, and athletics. Probably there were more weighty reasons and it may just have been his way of speaking, for Hogarth was ever aware that bare facts were made more piquant by the addition of a little flavour. He certainly had a brilliant record as an athlete. In his last year at Felstead he won the 100 and 220 yards, the quarter mile, and the long and high jumps; at Bart's he was captain of the cricket and football teams and also of United Hospitals; and he played for various first-class football clubs. The trophy he prized most was the medal awarded him for the open amateur long jump in 1890. During a boyhood spent in the Border country he acquired proficiency in fishing and shooting, and he retained a love of these throughout his life.

Despite his love of and skill at sports Hogarth was never deflected from his ambition to attain success in life and in surgery in particular. Indeed, his proficiency on the field of sport helped him on his way, bringing him hosts of friends and even to some extent shaping his future. His appointments as surgeon to the Notts Forest and Notts County football clubs led him to take an increasing interest in the treatment of injuries, fractures, and joint affections, and his services were often required for accidents in the hunting field. He was largely concerned with the inauguration of the Cripples' Guild, from which emerged the now well-known Harlow Wood Orthopaedic Hospital. He did, in fact, develop as a long suit in a general surgical practice what is now known as traumatic surgery.

Success came to him quickly. His reputation as a skilful operator and as one having cautious and careful judgment spread, and before long he had a magnificent surgical practice. In his presidential address to the B.M.A. in 1926 on "The Medical Practitioner and the Public" he showed remarkable foresight of the shape of things to come. He took the opportunity to advocate such measures as the provision of wards for paying patients and the extension of contributory schemes to meet the rising costs of hospitals and so possibly enable them to be preserved on a voluntary basis. It was only after the lapse of some years and in face of opposition that these projects were achieved in the county. He had the rare honour for a provincial surgeon not attached to a teaching hospital of being elected to the Council of the Royal College of Surgeons of England. Other distinctions came his way, and he was frankly appreciative of them. In his book of reminiscences, written in unpretentious vein, he looks back upon a life of very varied interests, and pays tribute to many who were his friends and helped him on his way. It seems strange that one of his greatest friends, from whom he derived much inspiration, Victor Bonney, should have died within a few days of him.

Hogarth—Bob to his friends—was a very human, genial person, with much charm of manner. There was nothing in the least degree thrustful in his demeanour—in conversation he was depreciatory of himself—and yet he was usually the centre of attention in any gathering, even in the presence of more celebrated people. He appeared frequently in the law courts, where he was much in demand in cases arising under the Workmen's Compensation Acts, and was a very able and wily witness. He had a disarming way of belittling his own knowledge and seeming to agree with the opposition—except, perhaps, over just one point, which was often a crucial one. He had always been rather occupied with his health, and for years before this really did decline he was a confirmed and self-confessed valetudinarian, but, as his complaints were interspersed with his natural drolleries, he was never a bore. His final illness was a protracted and a trying one. He was bed-ridden for over 18 months, and it was a relief when the release, for which he longed, came quickly and peacefully at the end.

Medical Notes in Parliament

Treatment of Rheumatism

Mr. J. SNOW on July 16 inquired whether the Minister of Health had considered the publication entitled "Rheumatic Complaints in an Urban Population" (Kellgren, J. H., *et al.*, *Ann. rheum. Dis.* 1953, 12, 5; and see leading article at p. 194 of this *Journal*), and whether, in view of this evidence of lack of treatment facilities and public knowledge of possibilities of cure in certain categories, he would have a survey made in small industrial towns.

Mr. IAIN MACLEOD said he was aware of this report, which provided evidence of reluctance to seek medical advice for rheumatic complaints rather than of lack of facilities. Although this exploratory work was of great interest it did

not yet warrant a great dispersion of effort from other research on rheumatic diseases into widespread inquiries of the kind suggested.

Mr. SNOW suggested that the Minister should consider the fact that the rheumatologist was not considered of consultative status by the Ministry of Health. He said physiotherapy departments were congested by cases referred to them by orthopaedic surgeons who had no specialist knowledge of the direct applications recommended by rheumatologists. Mr. MACLEOD replied that he recently received a deputation on consultant rheumatology and thought the Ministry had to some extent satisfied it.

Colonel M. STODDART-SCOTT asked whether Mr. Macleod knew that some regional hospital boards had no specialist facilities for treatment of rheumatism. Would the Minister ensure that throughout the country there were facilities whereby rheumatism could be diagnosed and given appropriate treatment? Mr. MACLEOD said he would like to look into that.

National Service Medical Boards

Colonel M. LIPTON asked the Minister of Labour on July 16 how doctors were selected for the medical examination of National Service recruits; what fees were payable; and what age limit was imposed on the doctors so selected.

Sir WALTER MONCKTON in reply said vacancies on the panels of the National Service Medical Boards were filled on the recommendation of a regional medical officer of the Ministry of Health after consultation with the local medical committee appointed under the National Health Acts. No precise qualifications were laid down, but a minimum of 10 years' professional experience was expected. The majority of practitioners appointed in recent years had had Service experience. Members of National Service Medical Boards were paid £2 12s. 6d. per session, normally of two and a half hours, with an additional half-guinea for the chairman. No age limit was imposed provided the doctor was fully fit and efficient, but, in general, a doctor over 65 years of age would not be nominated for appointment.

Sir WALTER MONCKTON on July 16 told Mr. Gower that he was examining closely the working of the National Service Medical Boards with a view to ensuring that the number of cases where men were not graded correctly according to the standards laid down—which he believed to be proportionately very few—was kept to a minimum. Medical boards were already required to go very fully into the personal and family medical histories of every man and to obtain reports from his medical practitioner or from any hospital by which he had been treated in any case where this appeared likely to help to resolve a doubt as to his fitness. Instructions had been given, and recently repeated, that in cases where there was doubt inquiries ought to be made either of the hospital or of the medical practitioner concerned. If the medical practitioner sent a certificate with the man it was attached to the medical report. Hospitals and consultants were consulted in one in every seven cases.

Prescription Charge

On July 16 Mr. A. BLENKINSOP asked whether the Minister of Health would abolish the 1s. prescription charge in view of the recommendation of the British Medical Association Annual Meeting.

Mr. IAIN MACLEOD answered: No, Sir. He said he had studied what had been said at the British Medical Association and also at the Trade Union Congress, but it had not altered his view that no change should be made at present.

Onchocerciasis in Africa

Mr. LESLIE HALE asked on July 15 what progress had been made with the survey of the incidence of onchocerciasis in the Gold Coast, Cameroons, and Nigeria entrusted to the British Empire Society for the Blind.

Mr. OLIVER LYTTTELTON said the main survey began in the Gold Coast last November. It was hoped to extend it

to Nigeria and the Cameroons early next year. The cost was being borne by the British Empire Society for the Blind, but the local Governments provided medical facilities and accommodation. Although the scheme had proved a heavy drain on the Society's finances, it hoped to be able to complete the survey within the allotted time.

Influenza Trials

Mr. MACLEOD in answer on July 16 to Mr. N. N. DODDS said the results of the trial of a new influenza vaccine carried out last winter had been given preliminary study by a committee of the Medical Research Council. Over 12,000 individuals took part in the trial. Influenza was diagnosed in 3% of the group given the new vaccine and in 4.9% of the group given an older type of vaccine. 6,340 volunteers received the new trial vaccine of the virus A type, and 192 had influenza. 6,370 received an older type, and 309 had influenza. These results were considered to be sufficiently encouraging to justify further research on the vaccine with a view to improving it.

Casualties in Korea

United Kingdom casualties in Korea up to the end of May, 1953, were 4,222 officers and men, of whom 702 were killed or died of wounds.

Hospital Doctors' Remuneration

Mr. GILBERT LONGDEN asked on July 9 what was delaying the review of the remuneration of hospital medical staffs.

Mr. IAIN MACLEOD answered that the matter was before the Medical Whitley Council. It raised difficult issues, but he was sure a decision would not be unnecessarily delayed.

Replying on July 8 to an inquiry by Mr. KENNETH ROBINSON concerning hospital consultants, Mr. MACLEOD circulated the following table:

Regional Hospital Board	At December 31, 1951			At December 31, 1952		
	Total No. in Contract with the Board (2)	Whole-time * (3)	Part-time † (4)	Total No. in Contract with the Board (5)	Whole-time * (6)	Part-time † (7)
Newcastle ..	322	139	183	358	110	248
Leeds ..	311	65	246	313	81	232
Sheffield ..	351	81	270	369	92	277
East Anglia ..	177	43	134	181	46	135
N.W. Met. ..	693	195	498	713	205	508
N.E. Met. ..	499	117	382	522	121	401
S.E. Met. ..	519	130	389	570	136	434
S.W. Met. ..	743	188	555	771	210	561
Oxford ..	178	34	144	189	38	151
South Western	321	68	253	326	68	258
Wales ..	260	86	174	290	102	188
Birmingham	431	160	271	481	181	300
Manchester ..	345	80	265	371	95	276
Liverpool ..	246	48	198	277	50	227

Notes: * The figures in columns (3) and (6) represent in terms of whole-time equivalents the amount of service given to each board by consultants who are whole-time in the National Health Service. Some whole-time consultants give part of their service to a second regional board, or a board of governors. † The figures in columns (4) and (7) are the difference between columns (2) and (3) and columns (5) and (6) respectively and they may not, therefore, correspond exactly with the numbers of individuals.

SCOTTISH HOSPITAL ENDOWMENTS

Commander T. D. GALBRAITH on July 13 moved that the Hospital Endowments (Scotland) Bill be read a third time. He said that the Hospital Endowments Commission, set up under the National Health Service (Scotland) Act, 1947, to inquire into existing endowments and to prepare schemes for their reallocation if necessary, had concluded that the income from the endowments was greater than could usefully be employed in providing additional amenities for Scottish hospitals. The Bill gave effect to the Commission's recommendation that some of this income should be made available for medical research. It provided for the setting up by the Secretary of State for Scotland of a Scottish Hospital Endowments Research Trust, and it would empower the Hospital Endowments Commission to transfer endowments

to that Trust. The Commission intended to transfer a proportion of the £13m. endowments with which it was concerned from the boards of management to the research trust. An amendment had limited the transfer of endowments to such an amount as produced in the year ended March 31, 1952, an income of £120,000. By giving this Bill a third reading the House would make it possible to establish in Scotland a valuable future medical research fund.

Mr. A. WOODBURN said there was no disagreement about the Bill in any part of the House. It sprang from a debate in the Scottish Grand Committee in 1948 which had disclosed that Scotland showed an increased incidence of tuberculosis, which in 1949 was found to be confined to young women and men over 53. It was necessary to investigate the problem further than could be done by collection of statistics. Consultations followed with the Medical Research Council with a view to having the Scientific Advisory Committee of the Secretary of State merged with the body which would undertake guidance of research in Scotland. The work of the Medical Research Council would not be interfered with, and it would be represented on the Scottish research body. Research should be an essential part of the training of students. The new body would have the opportunity of finding the people who were capable of research and giving them tasks to undertake.

Mr. JAMES MCINNES said he was glad the Secretary of State had eliminated the fears which existed in many hospitals in Scotland about the administration of these endowment funds.

The Bill was then read a third time without a division.

Universities of St. Andrews and Dundee

Mr. JAMES STUART on July 13 moved the third reading of the University of St. Andrews Bill, which had already passed the House of Lords. An amendment proposing that the University should have the title of the University of St. Andrews and Dundee was not selected by the Speaker. Mr. Stuart hoped that the new organs of government in the University would begin to function this autumn.

Lieutenant-Colonel WALTER ELLIOT remarked that many of the schools which had been developed in St. Andrews were in future to be developed in Dundee, notably the flourishing school of preclinical medicine.

Mr. HENDERSON STEWART said a new Dundee college was to be established, including not only the University College and the School of Economics, but also the advanced medical and dental schools.

The Bill was then read a third time.

INDUSTRIAL INJURIES BENEFIT

The report stage of National Insurance (Industrial Injuries) (No. 2) Bill was taken in the House of Commons on July 13. Mr. JOHN MCKAY moved to amend the section of the principal Act dealing with benefits for widows, in order to place the industrial widow in the same position as the widow who drew benefit under the National Insurance Act. In ordinary industrial occupations there were nearly 2,000 fatal casualties every year. Dr. H. MORGAN seconded the amendment.

Mr. OSBERT PEAKE said the amendment was acceptable to the Government. It brought the two Acts into line and ensured that the widow under the Industrial Injuries Act got the higher rate of widows' pension if she was over 40 when she ceased to be entitled to the widowed mother's allowance. The House agreed the amendment.

Mr. R. H. TURTON then moved that the Bill be read a third time. He said that by relaxation of conditions 8,000 claimants a year could qualify for disablement benefit, and perhaps 2,000 would qualify for special hardship allowance. The Government hoped the Bill would receive the Royal Assent before the recess and that the appointed day would be towards the end of August. Changes then would include provision of modified hospital treatment for men whose assessment was below 20% and who had a disablement gratuity.

Dr. BARNET STROSS was glad that men who had been recently rejected because they only had a small loss of faculty could now have their cases reopened.

Mr. TOM BROWN, speaking on the appointment of medical boards, said that many medical men and women who sat on these boards, particularly in the mining areas, had no knowledge of working conditions. It was essential that these boards should consist of persons who knew something of the conditions under which men and women sustained accidents.

The Bill was then read a third time.

M.O.s at Singapore.—There are 344 medical officers on the establishment in the Federation of Singapore. Seven of them are over 55 years of age. In addition 58 medical officers are employed on a month-to-month contract. There are 104 vacancies.

Cost of Ambulances.—The ambulance service, which cost £4,114,000 in 1948-9, is estimated to cost £9,593,000 in 1952-3.

Consultant Appointments.—The Minister of Health states that no consultant appointments proposed by regional hospital boards since January 1, 1953, have been rejected by him. A number of proposals, including 12 from the Newcastle Regional Hospital Board, are under consideration and discussion with the board.

B.C.G. Manufacture.—Any manufacturer may apply for a manufacturing licence for production of B.C.G. vaccine under the Therapeutic Substances Act, 1925. The conditions which an applicant would need to fulfil are laid down in the Therapeutic Substances Regulations, 1952.

Insurance Bill.—The National Insurance Bill was read a third time in the House of Lords on July 9.

Analgesia.—Gas-and-air machines available to domiciliary midwives in England and Wales were 4,098 in 1948, 5,430 in 1949, 6,051 in 1950, 6,156 in 1951, and 6,264 in 1952. In practice at present the analgesics which midwives may administer are pethidine or gas-and-air.

Royal Assent.—In the House of Lords on July 14 the Royal Assent was signified to the Births and Deaths Registration Act, the National Insurance Act, the Army and Air Force Annual Act, and the Therapeutic Substances (Prevention of Misuse) Act.

Medico-Legal

COMMANDING OFFICER ACQUITTED

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On July 16, 1953, Lieutenant-Colonel Alfred Gleave, R.A.M.C., the officer commanding Moston Hall Military Hospital, was acquitted by a Chester court martial of the two charges brought against him. These were that between April 1 and May 19, 1953, knowing that allegations had been made that Private Harrison had been ill-treated in hospital, he failed to report the matter to his superiors or make a proper investigation; and that on May 18 he improperly agreed the terms of a statement to the Press that he had made full inquiry into the allegations of ill-treatment, knowing the statement to be false.

On June 16 a statement was made in the House of Commons by the Secretary for War on the subject of Private Harrison's death, and it was said that the commanding officer of the hospital would be called to account for his conduct and would be tried by court martial. At the trial it was not suggested by the prosecution that Lieutenant-Colonel Gleave was party to any ill-treatment of Private Harrison, or knew or indeed before April 1 should have known that any ill-treatment was taking place.

Private Harrison was admitted to Moston Hall on March 26. On arrival he was examined by the admitting officer, Captain Lyle, in the presence of Lieutenant Moran. They observed that he walked in an extremely bizarre way but with no regular fault in his gait. He said he had no pain. A provisional diagnosis of hysteria was recorded and Private Harrison was assigned to Ward M 4/5, which at that time was in charge of Major Hobson. Next day because his moaning in the night had disturbed the other patients he

was moved to a side ward. On the night of March 27 Lieutenant Mary Parry Jones saw the other patients standing round Harrison, who was sitting on the floor, jeering at him. On March 30 he was transferred from Ward M 4/5 to a ward used as a mental and detention ward, where he came under the care of the psychiatrist, Captain Whiteley, who examined him twice and on April 1 thought he might be well enough to travel to Netley for specialist psychiatric treatment.

On that same evening the deputy matron, Major Maudsley, saw him on her rounds and thought he looked so ill that she at once sent for Captain Hamilton, the orderly medical officer, who examined him and could feel a growth in his liver. He was then taken to a private room and put on the dangerously ill list. He died on April 5.

Upon Private Harrison's name being put on the dangerously ill list, which was kept in Colonel Gleave's room, Captain Hamilton saw Colonel Gleave and told him the prognosis was hopeless, and Major Hobson came to him on April 2 in what he described as rather a flutter and said that Harrison's case had not been completely diagnosed and that they had missed his enlarged liver, which was probably malignant, and that the hysterical symptoms had rather overshadowed it. Colonel Gleave as a result issued orders that future examinations must be carefully carried out.

On April 10 one of the patients who had been in Ward M 4/5 when Private Harrison was there, a Private Nicholson, went absent, and when brought before Colonel Gleave elected trial by court martial. At his trial on May 17 both he and Private Rosser, who had been the night nurse in Ward M 4/5, made allegations that Private Harrison had been ill-treated.

On hearing these allegations, which came as a complete surprise to him, Colonel Gleave asked Captain Hamilton, Deputy Matron Maudsley, Major Serjeant (the administrative officer, and the chief wardmaster W/O Gillies if they had heard of any such thing taking place. He did not speak to the sister in charge of Ward M 4/5 because she was away on sick leave, nor to Major Hobson, who had left the Service. He discussed the allegations on the telephone with the A.D.M.S. Western Command, Lieutenant-Colonel Orr. He did not make inquiries in the wards or ask patients in Ward M 4/5 about the allegations, which he thought were fantastic. He did not think it desirable to send for Private Rosser and two other witnesses who gave evidence at Private Nicholson's court martial, because he thought them unqualified and biased.

When on the evening of May 18 Major Borthwick, the Command senior information officer, spoke to Colonel Gleave on the telephone, Colonel Gleave authorized a press statement to the effect that he had made full inquiry and was satisfied that there was no truth in the allegations that there had been ill-treatment of patients.

After a retirement by the court of 34 minutes the Judge Advocate announced that Colonel Gleave had been found not guilty of the first charge, and not guilty and honourably acquitted of the second.

Universities and Colleges

UNIVERSITY OF BIRMINGHAM

Professor F. A. R. Stammers has been appointed representative of the University on the Standing Joint Committee of the University, the United Birmingham Hospitals, and the Birmingham Regional Hospital Board; Professor A. B. MacGregor has been appointed a representative of the University on the Central Counties Dental Postgraduate Committee, Dr. J. M. Malins a representative of the University at the King Charles I School, Kidderminster, and Dr. K. A. Bisset a representative of the University on the International Congress of Microbiology, Rome, September, 1953. Dr. K. A. Bisset has been reappointed a representative of the University on the Public Health Classes Advisory Committee.

The title of Reader in Social Medicine has been conferred upon Dr. R. G. Record, Lecturer in Social Medicine. The title of Honorary Lecturer in Radiology in the Department of Surgery has been conferred upon Dr. C. G. Teall, University Clinical Lecturer in Radiology. The title of University Research Fellow has been conferred upon Dr. W. Taylor, part-time Lecturer in Medical Statistics, during his tenure of a fellowship financed by the Rockefeller Foundation. The title of University Clinical Lecturer has been conferred upon Dr. J. F. K. Hutton (Radiology). The title of Reader in Systematic Bacteriology has been conferred upon Dr. K. A. Bisset, Lecturer in Bacteriology.

Professor C. H. Pae, Department of Pharmacology, University of Taegu, South Korea, will work in the Department of Pharmacology for a year from October 1, 1953.

Professor J. W. Orr, Professor of Pathology and Director of Cancer Research, has been granted leave of absence for one month during the Autumn Term, 1953, to act as External Examiner and adviser in Pathological Studies at Makerere College, Uganda.

The Barling Scholarship for postgraduate work in Surgery has been awarded for 1953 to Mr. J. M. Small, University Clinical Lecturer in Neurosurgery.

UNIVERSITY OF LEEDS

At a meeting of the Council on June 17, a Rockefeller Travelling Fellowship for 1953-4 was awarded to Geoffrey Watkinson, M.D., M.R.C.P., Lecturer in the Department of Medicine.

The following appointments were announced: M. Ellis, M.B., F.R.C.S., as Clinical Lecturer in Surgery, and J. B. Farquhar, M.B., F.R.C.S., M.R.C.O.G., as Clinical Lecturer in Obstetrics and Gynaecology.

C. J. E. Wright, M.Sc., M.D., Lecturer in Pathology, has been granted leave of absence for one year, to enable him to take up a British Empire Cancer Campaign Travelling Fellowship in the U.S.A.

At a congregation for the conferment of honorary degrees held on June 25, on the occasion of the meeting in Leeds of the British Association of Urological Surgeons, the honorary degree of D.Sc. was conferred on Professor Charles B. Huggins and Mr. R. Ogier Ward.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examinations indicated:

FINAL M.B., Ch.B.—¹Winifred J. Coates, ²Ruth J. Grose, D. L. Archer, A. M. Bain, ³Isabel K. E. Brister, T. A. V. Brooks, J. G. Cook, A. J. Coppen, R. Crossley, K. D. Davies, P. W. E. Downes, Dorcas Edwards, M. B. Gee, W. E. L. Gordon, J. D. Jefferies, R. D. Laloo, A. J. Macdonald, Doreen E. McConnell, ⁴P. O. Nicholas, Marguerite E. Pennefather, J. H. Perry, H. Price, M. J. Ree, T. D. Richards, Beryl M. Shipton, Ruth L. Skrine, W. B. Spry, Audrey B. Stevenson, Margaret G. Taylor, J. W. Ware, A. J. Webb. In Group II, completing the examination: Elizabeth M. James. In Group II only: J. A. Beel, J. P. Bishop, Christine F. Boulter, Margaret V. Brown, M. J. Page, J. Roynance, Catherine M. Stephen.

DIPLOMA IN PUBLIC HEALTH.—Part II: M. C. O'Connor, G. D. Teague.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Part II: E. G. W. Cross, J. D. Orme.

DIPLOMA IN MEDICAL RADIODIAGNOSIS.—Part II: A. Bednarski.

The following candidates have been approved at the examination indicated:

M.D.—D. H. Johnson (with distinction), R. Maggs, R. H. Owen.

¹With second-class honours. ²With distinction in medicine. ³With distinction in child health. ⁴With distinction in public health.

FACULTY OF OPHTHALMOLOGISTS

Mr. A. B. Nutt (Sheffield) has been co-opted to the Council of the Royal College of Surgeons of England for 1953-4 as the representative of Ophthalmology.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates, having completed the final examination, have been granted the Diploma of the Society, enabling them (upon complying with the requirements of the Medical Acts) to practise medicine, surgery, and midwifery: A. Booth, G. I. Taylor, H. A. Whitehouse, G. J. John, J. G. Cooper, V. R. Jones, R. G. Jones, G. R. Vesey, C. M. Stevenson, J. D. Spouge, J. W. S. Webb, D. J. Waller, G. L. Haworth, L. Chapman,

C. L. Smith, W. G. Rhys-Jones, D. Porter, E. W. Fowler, T. C. Ryan, E. R. Lester, E. McK. Sycamore, R. A. Cooper, W. G. Nethery, B. Lewis, J. A. Scanlon.

CONJOINT BOARD IN IRELAND

The following candidates were successful at the recent post-graduate examinations:

DIPLOMA IN ANAESTHETICS.—P. R. Mesham, T. W. Vanniasingham, N. H. Jafry, Mary L. Mackay, Evelyn M. Gallagher, J. R. McCarthy, M. F. McGrath, E. A. Vaughan, J. D. Carstens, Nora M. Kelleher, A. A. Alvarez, J. D. Twomey, P. M. F. McGarry.

DIPLOMA IN CHILD HEALTH.—J. K. Heskin, Joan M. MacCarthy, J. F. O'Halloran, H. Z. G. O. Senanayake, Hirarani Thakur, T. J. Mahon, T. J. M. Lydon, Geeta S. Mehta.

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.—Dr. H. J. Scott.

Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in England and Wales in the week ending July 11 (No. 27) were as follows: paralytic 118 (85) non-paralytic 65 (41), total 183 (126). This is an increase of 57 compared with the previous week, the figures for which are in parentheses. Up to and including the twenty-seventh week the following numbers of cases were reported in the years shown: 1947, 487; 1948, 708; 1949, 631; 1950, 1,447; 1951, 907; 1952, 895; 1953, 1,200.

Week Ending July 11

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,072, whooping-cough 4,407, diphtheria 17, measles 5,504, acute poliomyelitis 183, dysentery 525, paratyphoid fever 3, and typhoid fever 6.

Infectious Diseases

During the week ending July 4 the largest falls in the number of notifications in England and Wales were 267 for scarlet fever, from 1,333 to 1,066, 261 for measles, from 6,871 to 6,610, 200 for dysentery, from 676 to 476, while the only large rise was 574 for whooping-cough, from 4,116 to 4,690.

The largest increases in the number of notifications of whooping-cough were 64 in Devonshire, from 114 to 178, and 60 in Essex, from 288 to 348. The largest declines in the incidence of scarlet fever were 52 in Lancashire, from 193 to 141, and 32 in London, from 87 to 55. The largest falls in the number of notifications of measles were 115 in Gloucestershire, from 318 to 203, 92 in Yorkshire West Riding, from 734 to 642, 83 in Cornwall, from 223 to 140, while the only large rise was 64 in Wiltshire, from 140 to 204. 14 cases of diphtheria were notified, being 4 fewer than in the preceding week.

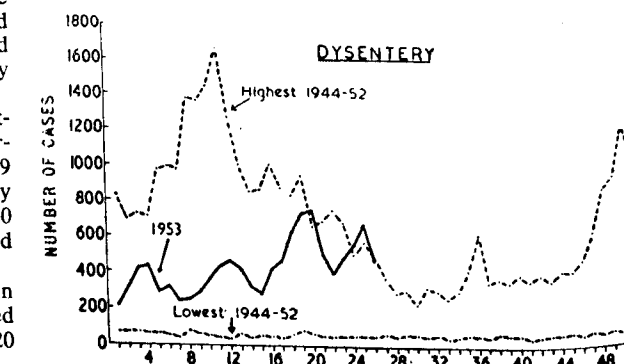
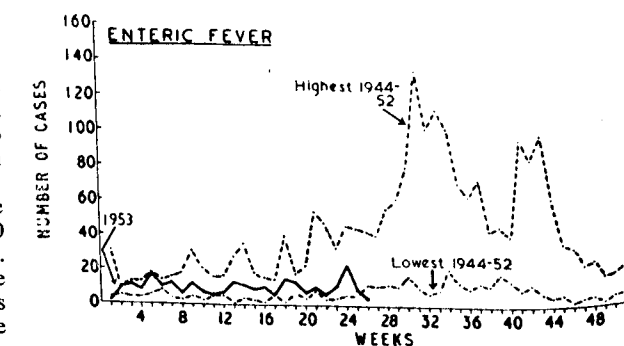
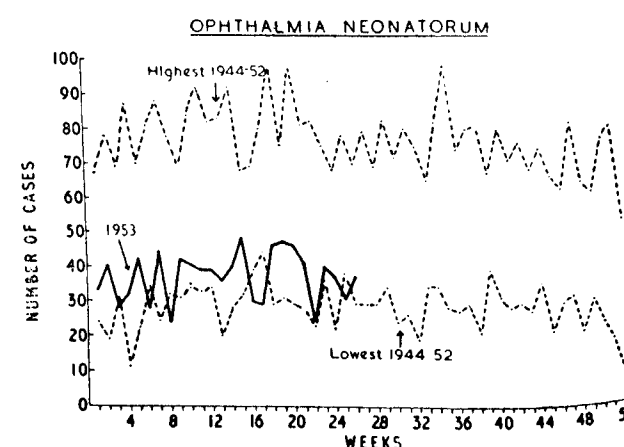
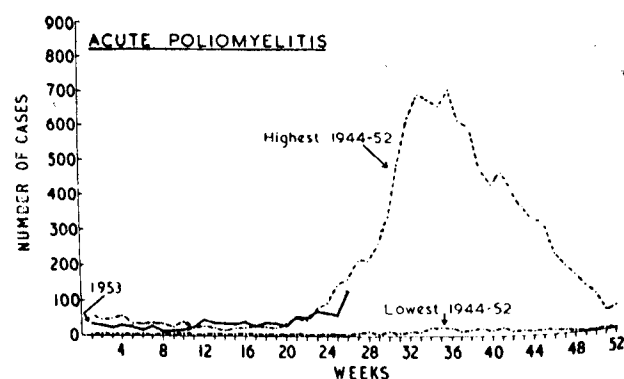
126 cases of acute poliomyelitis were notified during the week, and these cases were 36 more for paralytic and 30 more for non-paralytic cases than in the preceding week. The southern section of the country still continues to be the most affected, and during the week the number of cases increased from 43 to 94, compared with 17 to 32 in the remainder of the country. The largest returns during the week were Essex 24 (Southend-on-Sea C.B. 5, Chelmsford M.B. 4, Ilford M.B. 3), Middlesex 17 (Ruislip Northwood U.D. 3), Kent 9 (Chislehurst and Sidcup U.D. 2), Surrey 7, London 6, and Southampton 6 (Farnborough U.D. 2).

The largest returns of dysentery were London 85 (Deptford 13, Westminster 13, Islington 12), Lancashire 50 (Liverpool C.B. 15, Preston C.B. 12), Yorkshire West Riding 39 (Barnsley C.B. 10), Bedfordshire 34 (Luton M.B. 25), Surrey 31 (Banstead U.D. 10), Middlesex 31, Essex 21, Norfolk 20 (King's Lynn M.B. 14), Durham 20 (Stanley U.D. 8), and Staffordshire 19 (Brierley Hill U.D. 14).

144 of the 475 cases of food-poisoning were notified in Easington R.D., Durham. 93 further cases were reported from Lancashire, where the cases were spread over 20 administrative areas.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending July 4 (No. 26) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng & Wales	Land.	Scot.	N. Ire	Eire	Eng & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria ..	14	1	7	0	1	33	4	2	0	1
Dysentery ..	476	85	146	4		135	34	62	13	1
Encephalitis, acute ..	8	1	0	0		2	0	0	0	
Enteric fever: Typhoid ..	1	0	1	0		4	0	0	0	
Paratyphoid ..	3	0	1(B)	0		19	0	1(B)	0	1(B)
Food-poisoning ..	475	40		42		144	7		3	
Infective enteritis or diarrhoea under 2 years ..				15	36				18	20
Measles* ..	6,610	145	202	153	198	6,843	714	183	265	249
Meningococcal infection ..	47	1	17	1	4	30	4	16	0	1
Ophthalmia neonatorum ..	37	5	8	0		36	2	7	0	
Pneumonia† ..	329	15	138	3		310	10	158	3	
Poliomyelitis, acute: Paralytic ..	85	5	1	7	4	58	32	7	12	0
Non-paralytic ..	41	1				3				3
Puerperal fever‡ ..	261	38	19	0		233	29	11	1	
Scarlet fever ..	1,066	55	150	29	65	1,212	102	236	12	40
Tuberculosis: Respiratory ..			130	30				139	35	6
Non-respiratory ..			15	1				22		
Whooping-cough ..	4,690	355	370	42	41	2,444	124	112	75	85

DEATHS in Great Towns	1953					1952				
	Eng & Wales	Land.	Scot.	N. Ire	Eire	Eng & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0	0	0	0	0	0	0	0	0
Encephalitis, acute ..	0	0	0	0	0	0	0	0	0	0
Enteric fever ..	0	0	0	0	0	1	0	0	0	0
Infective enteritis or diarrhoea under 2 years ..	9	1	0	1	0	5	1	0	0	2
Influenza ..	3	1	0	0	0	2	0	0	0	1
Measles ..	1	0	0	0	0	0	0	0	0	1
Meningococcal infection ..	0	1	0	0	0	1	1	0	0	0
Pneumonia ..	131	21	15	7	6	129	13	7	3	0
Poliomyelitis, acute ..	8	2	0	0	0	3	1	0	0	0
Scarlet fever ..	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory ..	80	10	9	1	3	93	15	10	1	6
Non-respiratory ..	0	0	4	0	2	2	3	0	0	0
Whooping-cough ..	6	0	0	0	0	1	0	0	0	0
Deaths 0-1 year ..	233	24	22	10	11	202	30	28	5	11
Deaths (excluding stillbirths) ..	4,196	606	463	76	153	4,647	688	498	104	154
LIVE BIRTHS ..	8,038	1176	943	218	418	7,437	1122	899	215	440
STILLBIRTHS ..	168	20	23			187	30	23		

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

Medical News

First World Conference on Medical Education.—Details of the programme of this Conference (August 22-24) were published in the *Journal* of July 4 (p. 32). All those wishing to attend are advised to register as soon as possible by applying to the secretary of the Local Arrangements Committee, Dr. E. Grey Turner, B.M.A. House, Tavistock Square, London, W.C.1. To help to meet the expenses of the Conference, which are considerable, a registration fee of £4 is payable. Anyone interested in the work of the Conference may register, and registration confers the right to attend all meetings, excursions, and receptions. There will be a reception (6.30 p.m.) at B.M.A. House on August 22, and an excursion to Cambridge (10.30 a.m.) on August 23. On Monday, August 24, the Presidential Address on "The Challenge to Medical Education in the Second Half of the Twentieth Century" will be given by Sir Lionel Whitby in the morning, and the following addresses, also given in plenary session, will be delivered on Monday afternoon: "What is Education?" by Sir Richard Livingstone; "The History of Medical Education," by Professor John F. Fulton; and "Medicine—a Technology or a Profession?" by Colonel S. M. K. Mallick.

Medical Periodicals of the World.—This week, in London, medical librarians from all over the world have been attending the first international congress on medical librarianship, under the presidency of Sir Cecil Wakeley, P.R.C.S. On Monday, the day before the official inauguration of the congress, an exhibition of world medical journals was opened in the Old Library at B.M.A. House. The exhibition, which was arranged by Mr. L. T. Morton, information officer of the *Journal*, is probably the most complete and representative collection of current medical journals ever assembled. It contains over 2,000 journals from 68 different countries. The exhibition underlines the rapid trend towards specialization in modern medicine, and its impact on librarian, editor, and reader cannot but be healthily sobering. The delegates to the congress were entertained to tea at B.M.A. House before the opening of the exhibition, and Dr. Angus Macrae welcomed them on behalf of the Council of the British Medical Association. The exhibition was then declared open by Sir Francis Fraser in a speech of great felicity. He recalled his early debt to a librarian who had shown him how to use a medical library—"A gate to one of the great joys of my life." After describing what would be found in the exhibition, Sir Francis appealed to the assembled librarians not to grudge their personal help and instruction to the beginner in the use of a medical library. "You have something to give—something almost priceless."

Psychiatric Research.—The Rockefeller Foundation of New York has made a grant of £28,800 to the Department of Experimental Psychiatry, University of Birmingham, for research in psychiatry and in the biochemistry and pharmacology of the nervous system. The work will be under the direction of Professor J. Elkes. The department was founded in 1951. Its aim is the application of experimental methods to problems of clinical psychiatry. The problems under investigation at present are essentially neurochemical and neuro-pharmacological. It is, however, hoped to develop systematic studies into the preventive and social aspects of psychiatry as well. An early treatment centre, comprising in-patient, day-patient, and out-patient facilities, is being planned, and this should provide a suitable setting for studies of this kind.

Other Rockefeller Awards.—Two other Rockefeller grants to support scientific projects in British universities are announced this quarter. About £14,000 is being provided for neurohistological and neuro-anatomical research at the Department of Human Anatomy, Oxford, under the direction of Dr. A. G. M. Weddell. University College, London, is

receiving £8,000 for research in mammalian genetics under the direction of Dr. H. Grüneberg. The work will be done in the Department of Eugenics, Biometry, and Genetics over a period of five years. Grants to enable British workers to visit laboratories and research institutions in the United States and Canada go to Dr. W. F. Floyd, of the department of physiology, Middlesex Hospital Medical School, Dr. J. F. Goodwin, lecturer in medicine at the Postgraduate Medical School of London, Professor R. A. Gregory, professor of physiology at Liverpool University, and Professor C. F. W. Illingworth, Regius Professor of Surgery at Glasgow University.

University of London Model Welfare Centre.—A building licence has now been issued for the model child welfare centre and school clinic which is the first part of the development plan of the Institute of Child Health. The building is made possible by a magnificent gift received some years ago from the South African "Aid to Britain Fund." The project is being financed by the "Natal Gift," a sum originally of £106,000 which was raised in the Province of Natal. A site has been purchased at the corner of Guilford Place and Guilford Street. The new building will provide on the ground floor facilities for normal maternity and child welfare centre work, and on the first floor for school clinic work. The London County Council will be responsible for a substantial portion of the running costs. The centre will be used for demonstration purposes for the postgraduate students of the Institute, and for the study of the healthy child. Plans for the building are at an advanced stage and preparation of the site is to start forthwith.

Heberden Society.—Meetings of the Heberden Society were held in Manchester and Buxton on July 10 and 11. Lord Horder, the president of the Society, presided. The annual Heberden Round was conducted by Dr. J. H. Kellgren, director of the Rheumatism Research Department at Manchester. He took as his theme the subject of osteoarthritis, and showed cases illustrating the variations in the condition from the monarticular type to the newly defined syndrome of "primary generalized osteoarthritis," which Dr. Kellgren and Dr. R. Moore described recently in the *British Medical Journal* (January 26, 1952, p. 181). This was followed by demonstrations of the research into the chemical and physical aspects of collagen tissue which are being carried out in the new laboratories of the department. After tea communications were given by Dr. H. G. B. Slack on "Isotope Studies of Collagen Metabolism," by Mr. D. S. Jackson on "Chemical Studies of Connective Tissue Stability," and by Dr. J. Ball on "Fatal Complications of Rheumatoid Arthritis." Sir Harry Platt was the chief guest at the Society's dinner at the Senate House of the University of Manchester. Next day the meeting was continued at the Royal Devonshire Hospital, Buxton, where Dr. R. Harris demonstrated methods of rehabilitation in the chronic rheumatic diseases, Mr. J. C. Cregan presented cases showing the results of acrylic arthroplasty of the hip in traumatic and osteoarthritic disease, and Dr. H. S. Barber presented a number of cases for discussion.

Polar Medals.—Among the members of the Falkland Islands Dependencies Survey who have been awarded the Polar Medal in Silver for "good services in Antarctic expeditions between the years 1944-50" are eight doctors. They are: Surgeon Captain E. W. Bingham, Dr. J. D. Andrew, Surgeon Lieutenant-Commander E. H. Back, Dr. A. R. C. Butson, Surgeon Lieutenant D. G. Dalglish, Dr. J. M. Roberts, Dr. W. J. L. Sladen, and Dr. R. S. Slessor.

COMING EVENTS

Ophthalmology Congress.—The 17th International Congress of Ophthalmology will take place at the Waldorf Astoria Hotel, New York City, from September 12 to 17, 1954. The president is Dr. Bernard Samuels, New York. The main topics for discussion at the congress will be primary glaucoma and the aetiology of uveitis. Original

papers should be submitted to the secretary-general not later than January 1, 1954. Further information about the arrangements for the congress may be obtained from the secretary-general, 17th International Congress of Ophthalmology, 100, First Avenue Building, Rochester, Minnesota, U.S.A.

International Society for the Study of Biological Rhythms.—The fourth meeting of this Society will take place at Basle on September 18 and 19. Speakers include Professor C. P. Richter, from the Johns Hopkins Hospital, Baltimore, Dr. G. P. Wells and Professor H. Kalmus, from University College, London, and Dr. J. N. Mills and Dr. S. W. Stanbury from the University of Manchester. Further information may be obtained from Professor F. Georgi, Neurologische Universitäts-Poliklinik, Basle, Socinstrasse 55.

Electroencephalography and Clinical Neurophysiology.—The Third International Congress of Electroencephalography and Clinical Neurophysiology will be held at Boston, Massachusetts, from August 17 to 22. Further details may be obtained from Dr. Robert S. Schwab, secretary general of the congress, Massachusetts General Hospital, Boston 14, Massachusetts, U.S.A.

SOCIETIES AND LECTURES

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

Monday, July 27

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., three-dimensional surgical film in colour: Mediastinal Tumours.

Tuesday, July 28

INSTITUTE OF NEUROLOGY.—5 p.m., Professor Kurt Goldstein (U.S.A.): On Aphasia.

APPOINTMENTS

CARRICK, GORDON S., M.B., Ch.B., D.P.H., D.I.H., Medical Officer of Health and Port Medical Officer for the Burgh of Greenock.
DUNLOP, META L., M.B., B.Ch., D.P.H., Medical Officer of Health, Borough of Gillingham, Kent; continuing also as Assistant County Medical Officer of Health (half-time).

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—A. H. C. Couch, M.D., M.R.C.P., Consultant Chest Physician in the East Norfolk Area; M. F. Bethell, M.B., B.Chir., Senior Registrar in Psychiatry in the Ipswich Area; N. Vincenti, M.D., Ear, Nose, and Throat Registrar, East Suffolk and Ipswich Hospital and Ipswich Borough General Hospital; M. E. Johnston, M.R.C.S., L.R.C.P., Ear, Nose, and Throat Registrar, Peterborough Memorial Hospital.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—G. G. Wylie, F.R.C.S., Surgical Registrar; J. G. Stewart, M.R.C.S., L.R.C.P., Part-time Ophthalmic Registrar; D. O'Brien, M.B., B.Chir., D.C.H., House-physician; J. R. F. Ingall, M.B., B.S., House Surgeon to Ear, Nose, and Throat Department; G. Fleet, M.B., B.S., House-surgeon.

RITCHIE, DAVID A. R., M.B., Ch.B., D.M.R.D., Senior Registrar in Radiodiagnosis, Western Infirmary, Glasgow.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—J. Scott Brown, M.D., D.T.M.&H., D.M.R.E., Consultant Radiologist to South Somerset Clinical Area; H. V. Wingfield, F.R.C.S.Ed., Consultant Thoracic Surgeon to Devon and Cornwall Area.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Fletcher.—On July 13, 1953, in Manchester, to Nans Trefflys (formerly Jones), wife of Frank Fletcher, M.D., a son.

Jones.—On July 12, 1953, at University College Hospital, London, W.C., to Monica (formerly Cogman), M.B., B.S., wife of Peter Jones, M.V.O., F.R.C.S., a daughter.

Jordan.—On July 18, 1953, at Cardiff, to Dr. Patricia (formerly Arnold), wife of Dr. J. Warren Jordan, a daughter.

Laidlaw.—On July 9, 1953, at 40, Sherbrooke Avenue, Glasgow, S., to Caroline, wife of Dr. Stuart Laidlaw, a son—Ian Maxwell Stuart.

Mace.—On July 12, 1953, at the Lewisham Hospital, London, S.E., to Josephine (formerly Bruce), wife of Dr. B. E. W. Mace, a sister for Peter James.

Rogers.—On July 14, 1953, at Cardiff Royal Infirmary, to Barbara, wife of Lambert Rogers, V.R.D., F.R.C.S., a daughter.

Sherburn.—On July 4, 1953, at Fairfield Nursing Home, Doncaster, Yorks, to Margaret Beryl (formerly Shepherd), wife of Dr. Vincent E. Sherburn, of 87, Alderson Drive, Doncaster, a daughter—Patricia Anne.

DEATHS

Gater.—On July 10, 1953, at Oakfield, Salisbury Road, Fordingbridge, Hants, Arthur William Gater, M.R.C.S., L.R.C.P., Lieutenant-Colonel, R.A.M.C., retired.

James.—On July 5, 1953, at North Charlton, Alnwick, Northumberland, Margaret Helen James (formerly Morton), M.B., B.S.

Liley.—On July 8, 1953, at Tripoli, North Africa, James Arthur Liley, M.C., M.R.C.S., L.R.C.P.

Manifold.—On July 6, 1953, the result of an accident, Ronald Hector Cameron Manifold, M.R.C.S., L.R.C.P., D.M.R.D.

Any Questions?

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

Penicillin and Sulphonamide Tablets

Q.—Is there any special advantage in the combination of penicillin with two sulphonamides in one tablet?

A.—There is no proved synergistic action between penicillin and the sulphonamides, though of course their use in combination does cover a wider range of organisms. Oral penicillin, though particularly useful in children, is a most expensive form of treatment, and should not be encouraged for conditions where the sulphonamides alone would act equally well. There would thus seem to be little justification for combining these two agents in one tablet.

P.A.S. for Arthritis

Q.—Australian workers have claimed good results from the treatment of rheumatoid arthritis and osteoarthritis with sodium para-aminosalicylate. Has this treatment been tried in Britain, and, if so, with what results?

A.—The natural history of rheumatoid arthritis is characterized by recurrent exacerbations and remissions, and this fluctuating course has led to many therapeutic claims which have not been upheld by further experience. In generalized osteoarthritis affected joints often pass through a more or less acute, disabling, painful stage, which is followed by a partial recovery of function although the anatomical changes in the joints tend to increase. Therapeutic claims in these diseases should therefore be viewed with great caution, particularly if they are not supported by very carefully controlled trials.

Para-aminosalicylic acid was given a careful small-scale trial¹ in the Edinburgh University unit for the treatment of chronic rheumatic diseases. These workers failed to demonstrate any therapeutic effect in patients with rheumatoid arthritis, even when the drug was given in high enough dosage to produce toxic side-effects.

REFERENCE

¹ *Ann. rheum. Dis.*, 1950, 9, 132.

Boric Acid Poisoning

Q.—A 63-year-old woman patient of mine has been taking a teaspoonful of boric acid powder for four weeks, mistaking the container for one which used to contain Epsom salts. Thus she took, daily, four times the maximal dose of an allegedly cumulative drug without any ill-effects whatever. Large amounts of boric acid are said to produce albuminuria, malnutrition, insomnia, headache, dimness of vision, depression, feeble pulse, ecchymoses, lumbar pain, nausea, vomiting, diarrhoea, collapse, and death. Could pharmacologists have based their information on one or two isolated cases? What is the explanation of my patient's lack of symptoms?

A.—It is generally agreed that amounts of boric acid above 2 grammes daily may be harmful, but the variation in susceptibility of different persons is very great. For many substances there is a tenfold variation. Thus one person may need ten times as much of a substance as another to produce a certain effect whether medicinal or toxic. The B.P. dose is an average dose. Excretion of boric acid requires several days, though it reaches maximum rate in two hours. Ross and Conway¹ quote 27 cases of poisoning,

20 of which were fatal. More than half of these were infants, in whom 1 to 3 grammes was often fatal. A number of adults are reported to have died after the application of boric acid to wounds and ulcers. Others survived the injection of 15, 20, and 28 grammes respectively. Only one case of accidental ingestion by an adult is reported. This was fatal; one and a half ounces (45 grammes) of borax was found in the stomach. Watson² considers that boric acid is almost entirely ineffective as a drug and at the same time dangerous, and that it should be removed from general use as rapidly as possible.

REFERENCES

¹ *Amer. J. Surg.*, 1943, 60, 386.
² *Lancet*, 1950, 1, 216.

Syringes in General Practice

Q.—We are intending to replenish our stock of syringes for our general practice. What varieties are available, and which type of mount is recommended? How should the syringes be sterilized and transported?

A.—The following types of syringe are available: Glass and metal (stainless steel) syringes, with metal plungers; glass and metal syringes, with ceramic plungers; glass syringes, with glass plungers but with metal needle mounts; and all-glass syringes. The first three types of syringe generally have Record mounts. Although there are no particular disadvantages in using syringes having Luer or S.I.M.A. mounts, it should be borne in mind that in this country the needle most readily available is that with the Record mount. All-glass syringes are generally produced with a Luer mount, as this is less liable to fracture than the lighter Record mount. A Luer to Record adapter is available so that needles with a Record mount can be used on all-glass syringes.

Boiling is still the most convenient method of sterilizing all these types of syringes, care being taken to keep barrel and plunger separate if the plunger is made of metal. All-glass syringes may be sterilized by the hot-air method, at a temperature of 150° to 170° C. (see *Med. Res. Coun. Mem. No. 15, H.M.S.O.*). After boiling, or other method of sterilization, the syringes may be kept in 75% alcohol. This solution can conveniently be prepared by adding 5 oz. (140 ml.) of sterile distilled water to a pint 570 ml.) of industrial methylated spirit, the alcohol content of which is about 95%.

Metal spirit-proof cases are available for carrying syringes (up to 20 ml.) in the bag. These cases contain either the syringe and one needle or the syringe and six needles. However, to prevent contamination of the spirit by blood-borne viruses, such as that of infective hepatitis, needles that have been used should not be returned to the container before being boiled; and when blood or other fluid has been withdrawn into the barrel of the syringe (as just before an intravenous injection), the syringe itself should be sterilized before being returned to the spirit. Once a week the whole container should be sterilized by boiling and refilled with fresh spirit.

Vaccination in Pregnancy

Q.—Are there any specific dangers to mother and foetus in primary vaccination during pregnancy?

A.—There is some indication from an investigation carried out in Glasgow that pregnant women who are vaccinated in the first three months of pregnancy are more likely to abort than are unvaccinated women. There is no positive evidence about the occurrence of developmental abnormalities in the foetus if it lives until full term. The risk of abortion does not seem to extend beyond the first trimester, but obviously a severe primary vaccinia, like any acute infection in a pregnant woman, may endanger the life of the foetus at any stage of its development. Primary vaccination in pregnancy should not therefore be recommended unless there are compelling reasons for it.

Height and Weight Tables

Q.—Height and weight tables for both children and adults seem nowadays on the low side. Most of these tables were compiled many years ago. Could up-to-date figures be given?

A.—Height and weight tables for adults generally give the "normal" weight for different heights and ages; they give no information about the "normal" or average height. The best tables that are available are those published by the Metropolitan Life Insurance Company of New York, but a comparison of these with older tables gives no indication whether American adults are taller now than they used to be, but only whether they are heavier at a given height and age.

Unfortunately, there are no up-to-date tables for the heights and weights of British adults or children which are sufficiently comprehensive to be recommended for general use, but there seems to be no doubt that present-day children are both taller and heavier than children of similar ages 30 or 40 years ago. Until measurements of large numbers of British children are available the figures published in 1941 by O'Brien, Girshick, and Hunt¹ are recommended. These tables were compiled from the average measurements of 147,000 American children from various walks of life and living in 17 different States; the measurements were made between 1937 and 1939 for the purpose of designing patterns for children's garments.

REFERENCE

¹ U.S. Dept. of Agriculture. Publ. No. 366, Washington, 1951.

Beryllium-containing Alloys

Q.—I am medical officer to a company of electrical and electronic component manufacturers. During the process of manufacturing, a compound bronze, containing 0.25% of beryllium, is used in sheet and strip form. Does the beryllium content in the compound render the bronze any more poisonous? If so, what sort of precautions should be taken in the treatment of cuts and abrasions acquired by the workers during the handling of this material?

A.—Chronic berylliosis has been recorded following exposure to beryllium in the manufacture of beryllium-containing alloys, but up to the present time no cases are known to have occurred when exposure to beryllium has been limited to the handling of the finished alloy. It is unlikely that granulomata of the skin would result from cuts and abrasions acquired by workers handling the compound bronze described.

Transfusion Technique in Agranulocytosis and Thrombocytopenia

Q.—If it is decided to give fresh blood to patients with agranulocytosis or thrombocytopenia, what transfusion technique is recommended? If the blood is citrated, the leucocytes and platelets are rapidly destroyed.

A.—In cases of agranulocytosis or thrombocytopenia it should theoretically be best if the blood is given by the direct syringe method; but in practice it is found quite satisfactory if citrated blood is used, the donor being bled immediately before the transfusion is given. In agranulocytosis the blood is of value not particularly for supplying leucocytes but for supplying fresh complement and probably other unknown factors. Transfusions of blood from cases of chronic myeloid leukaemia or polycythaemia with a high leucocyte count do not appear to be more beneficial than transfusions of normal blood. In thrombocytopenia methods for preparation of suspensions of blood platelets for transfusion have been devised,¹ and these have been reported to be effective.

REFERENCE

¹ J. clin. Path., 1953, 6, 41.

NOTES AND COMMENTS

Psoralens and Vitiligo.—Dr. H. GRUEBEL LEE (Johannesburg) writes: I read with interest under "Any Questions?" (*Journal*, June 13, p. 1344) the item concerning the place of psoralens in the treatment of vitiligo. In the 1952 *Year Book of Dermatology and Syphilology* (p. 65) mention is made of the treatment of this disability by topical application, or oral treatment in tablet form, or a combination of the two, with two crystalline extracts, ammoidin and ammidin, isolated from the annual umbelliferous plant well known in Egypt, *Ammi majus* lin. (Edwin Sidi and J. Bourgeois Gavardin, of the St. Louis Hospital, Paris). At the same time actinotherapy resulting in erythematous-vesiculation was given, sunlight appearing more effective than ultra-violet irradiation. Only six cases were treated, two with topical application alone, one only receiving the drugs in tablet form, and the remaining three being treated by a combination of both. The results appeared encouraging, in that repigmentation was established in some of the patients treated. It is obvious that the number of cases dealt with is too small to draw conclusions from. Further, one has seen vitiliginous lesions where pigmentation has re-established itself spontaneously, and finally a small proportion of cases appear to clear by the empirical exhibition of vitamins, if continued for a sufficient length of time. Parenteral treatment by gold salts is, I think, on account of their toxicity, unwarranted in a condition that is harmless apart from the possible psychological stress conditioned by its cosmetic imperfection. I have long held the opinion that in vitiligo the melanin-forming mechanism is in a state of inhibition rather than that of permanent impairment. In 1946, through the courtesy of Dr. I. Muende, I showed at a meeting of the Royal Society of Medicine a case of dermatitis bullosa striata pratensis, an occupational pigmentary dermatosis caused by contact with parsnips or other plants, with subsequent exposure to sunlight. Incidentally in the skin-patch testing of this one case more definite positive tests were elicited with the stem than with the parsnip itself. It occurred to me later that such aetiological factors might be used as a basis for therapy in vitiligo; and accordingly I subjected in 1949 and onwards about a dozen cases to such. Unfortunately this was done in the absence of scientific criteria—namely, the parsnip solution was prepared the night before use as an aqueous solution containing a hypersaturation of vegetable and stem, finely grated, and filtered the following morning before use. It was painted on as three coats on the lesions, allowed to dry, and these were subjected to suberythema doses of ultra-violet radiation. At the same time these patients received twice daily vitamin-B complex and 50 mg. of ascorbic acid, together with 100 mg. of para-aminobenzoic acid three times a day. Treatment was given twice weekly, and lasted several months. Roughly half the cases improved, the first two completely; but, as appears to be usual in any new treatment, particularly when not subject to adequate control, the later cases failed to react. One's initial enthusiasm consequently waned. It is of interest that the first case who exhibited a multiplicity of lesions on the face, neck, chest, and back completely cleared, although several lesions—for example, behind the ears and on the back—received no treatment, and lagged behind the others in their resolution. Initially when such lesions clear they are manifest by pigmented stippling.

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CHRONIC BRONCHITIS: AN INTRODUCTORY EXAMINATION OF EXISTING DATA*

BY

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During 1950 a survey was made of the registered disabled persons in four areas of Great Britain. Particular attention was paid to the causes of disablement and to the effects of disability on employment. In all four areas chronic respiratory disease was an important cause of disability; in the north-western area it was the largest single disease group among registered disabled persons and accounted for more unemployment than any other physical condition. This led to an examination of the data available on death and sickness resulting from chronic respiratory disease among the general population. These data are summarized here.

I. MORTALITY

In much of what follows the Registrar-General's figures are used. It is first of all necessary to understand what is implied by "chronic bronchitis" when used as a cause of death on death certificates. It is likely to cover a wide range of conditions from bronchiectasis or chronic bronchitis and emphysema to the degenerative conditions, often primarily cardiovascular, of the older age groups. The Registrar-General has often indicated that there is an overlap between bronchitis and pneumonia as the primary cause of death, and also a similar overlap between deaths caused by respiratory and heart diseases at older age groups. Indeed, as long ago as 1848, William Farr pointed out that "bronchitis and other inflammations or congestions of the chest were . . . the causes of many deaths, particularly among persons afflicted with asthma and heart disease."

If a large proportion of deaths are assigned indifferently to respiratory or myocardial causes, a study of the respiratory deaths alone may give a misleading impression. For this reason, where possible, deaths from bronchopneumonia and from the group of deaths termed "myocardial degeneration" are considered in parallel with those from bronchitis.

The change in 1939 of the Registrar-General's method of selecting the primary cause of death from certificates

*A précis of some of the main points formed a contribution to a symposium on chronic bronchitis at the Annual General Meeting of the Association of Physicians of Great Britain and Ireland in May, 1952.

†Working on a Medical Research Council grant.

with multiple causes has greatly affected the respiratory group of deaths. Under the rules prevailing before 1939 any heart disease was chosen as the primary cause of death in preference to a respiratory disease when both were mentioned together. From 1939 the deaths have been classified according to the primary cause given by the doctor signing the death certificate. The effect of this change can be judged by the fact that the 1938-9 bronchitis mortality figures would show a "100% increase at all ages for each sex, the effect being smallest at ages under 5 and greatest at ages between 55 and 75" (Registrar-General, 1947). Thus, in general, the figures of respiratory deaths before and after 1939 cannot be compared other than for the crude total rate for which the Registrar-General gives conversion factors.

As mortality from bronchitis is negligible below the age of 50, it is unlikely that the mortality rates will be affected very much by the exclusion of those in the armed Forces during the war years.

Sex and Age Differences

When used for comparing groups such as men and women inaccuracies in classification are likely to affect both sexes equally and comparison can be informative.

Fig. 1 gives the age specific death rates from bronchitis for men and women separately. The rates for men are three to four times those for women of the same age; the mortality of men of each age group is, in fact, very similar to the mortality of women 10 years older. (A similar difference between the rates for men and women is found in the Scottish figures, although the rates are in fact lower.) Examination shows that this is not due to more women than men being certified as dying of heart disease.†

†A difference of three times in the respiratory rates would mean that nearly all the female deaths attributed to "myocardial degeneration" would have had to be misdiagnosed in this way. This is very unlikely, especially as the male rate from this cause is already about one and a half times that of the female. Moreover, the male/female ratio for death rates from myocardial degeneration has remained constant throughout this period. The group of bronchitis deaths which also had myocardial disease mentioned on the certificate as a contributory or secondary cause of death were tabulated by the Registrar-General up to and including 1945 and formed about 30% of all bronchitis deaths for both sexes at 45-54, 37% at 55-64, and about 40% at 65-74 years.

That men have a higher death rate than women for all causes is a well-known feature of the past 100 years, and during this period the male excess has steadily increased (Martin, 1951). The rates from bronchitis, however, show a greater male excess than for all causes, the male/female ratio for bronchitis being more than

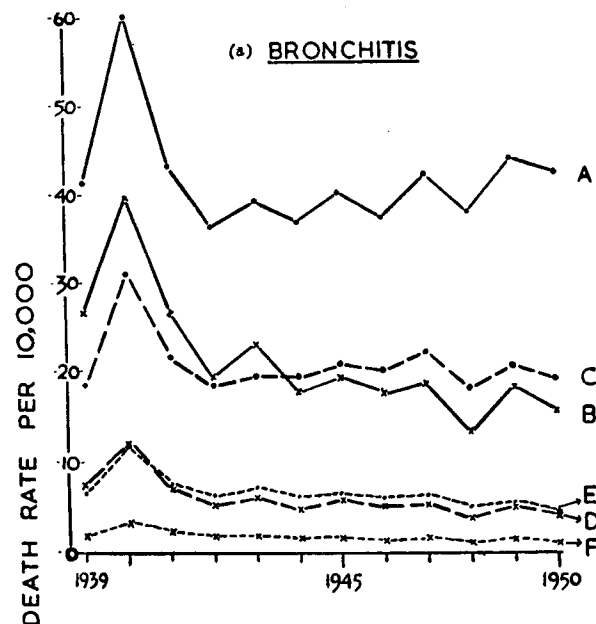


FIG. 1.—Bronchitis and bronchopneumonia death rates, 1939-50. A=Men aged 65-74. B=Women aged 65-74. C=Men aged 55-64. D=Women aged 55-64. E=Men aged 45-54. F=Women aged 45-54.

TABLE I.—Ratio of Male to Female Death Rates in Age Groups

Year	Bronchitis			Broncho-pneumonia			Myocardial Degeneration			All Causes		
	45-54	55-64	65-74	45-54	55-64	65-74	45-54	55-64	65-74	45-54	55-64	65-74
1939	3.5	2.5	1.6	1.9	1.6	1.3	1.4	1.4	1.2	1.5	1.5	1.4
1940	3.6	2.6	1.5	2.0	1.6	1.3	1.5	1.5	1.3	1.6	1.6	1.4
1941	3.3	3.1	1.6	1.9	1.9	1.2	1.4	1.5	1.3	1.5	1.6	1.4
1942	3.8	3.6	1.9	1.9	1.9	1.4	1.3	1.7	1.3	1.5	1.6	1.4
1943	3.8	3.2	1.7	1.9	1.8	1.4	1.5	1.6	1.3	1.5	1.6	1.4
1944	3.8	4.0	2.1	2.4	2.1	1.5	1.6	1.6	1.3	1.5	1.7	1.5
1945	3.8	3.5	2.1	2.1	2.2	1.5	1.4	1.5	1.3	1.5	1.7	1.4
1946	4.1	3.9	2.1	1.9	1.6	1.6	1.5	1.6	1.3	1.6	1.7	1.5
1947	3.6	4.1	2.3	1.9	1.6	1.6	1.5	1.6	1.3	1.5	1.8	1.5
1948	3.9	4.7	2.8	1.8	2.2	1.6	1.5	1.6	1.3	1.5	1.8	1.5
1949	3.6	4.1	2.4	1.7	1.8	1.4	1.3	1.6	1.3	1.6	1.8	1.5
1950	4.4	4.4	2.7	1.5	1.6	1.5	1.3	1.4	1.3	1.6	1.8	1.5

twice that for deaths from all causes in age groups 45-54 and 55-64, while for the 65-74 age group the male/female ratio was in excess to a smaller degree. The myocardial degeneration group of deaths and deaths from bronchopneumonia, however, shows a male excess much nearer the excess for all deaths (Table I).

Social Class

The most recent data on social class mortality are for the triennium 1930-2, when there was an inverse relationship between the death rate from respiratory disease and the

social class. The mortality from bronchitis (Fig. 2, Tables II and III) in social class V (unskilled workers) for both men and women was about five times as great as that for social class I (professional classes). For myocardial disease the correlation with social class is also similar, but the gradient is less steep. Sutherland (1947) has pointed out that each social class consists of a conglomeration of occupations which show a wide range of mortality rates within each class. He examined the variation between these classes compared with that within each class. This has been done here for both bronchitis and myocardial diseases, and the observed gradient with social class was statistically significant for both of these disease groups.†

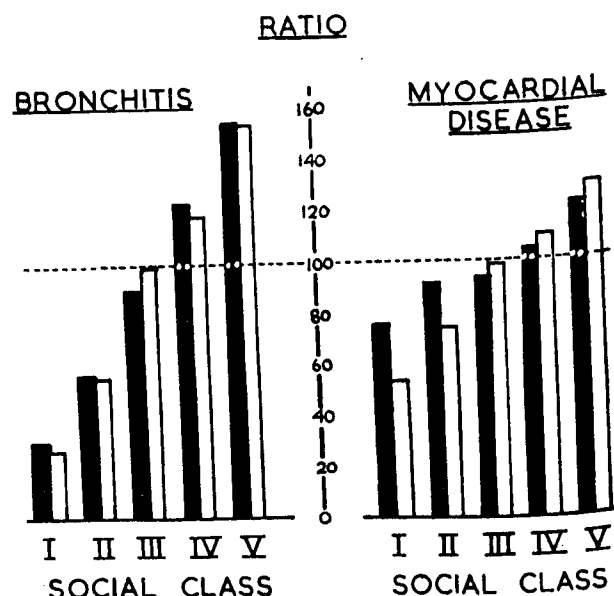


FIG. 2.—Distribution of deaths from bronchitis and myocardial disease according to social class, 1930-2. Ages 20-65 years. The mortality for all men (black columns) or all married women (open columns) is represented by 100.

TABLE II.—Bronchitis Deaths, 1930-2. Standardized Mortality Rates

Social Class	Men		Married Women 35-65	Single Women 35-65
	20-65	35-65		
I	31	31	27	87*
II	57	57	57	58
III	91	92	99	58
IV	124	126	121	78
V	156	157	156	78
All social classes, including unoccupied	100	100	100	100

* Including unoccupied single women.

One of the striking features of Fig. 2 is that, although the actual rates for men were higher than for women, the ratio of deaths between the various social classes was similar for the two sexes. It would appear, therefore, that in 1930-2 some at least of the factors which determined this ratio affected men and women equally, and these would more likely be of a general environmental rather than of an exclusively occupational nature.

To see if the association between social class and chronic bronchitis still exists in spite of changed conditions, a more up-to-date measure is available. Wilkins (1952) found that a useful measure of the socio-economic status of towns is the percentage of households in which the chief wage earner has a basic wage exceeding £7 10s. a week. He estimated this percentage for the county boroughs of

†As in Sutherland's paper, the analysis of variance was applied to the logarithms of the standardized mortality ratios, as these unlike the ratios themselves, were normally distributed. The ratio of the between to within variances were for bronchitis 7 ($P < 0.001$) and for myocardial diseases 5.8 ($0.01 > P > 0.001$).

TABLE III.—Bronchitis Deaths, 1930-2. Comparative Incidence of Social Class Mortalities. (Rate for all Social Classes, Including Unoccupied in Each Age Group=100). (From Registrar-General's Decennial Supplement, 1931)

Social Class	Men					Married Women					Single Women				
	20-	25-	35-	45-	55-65	20-	25-	35-	45-	55-65	20-	25-	35-	45-	55-65
I	—	D	D	32	33	—	D	D	D	D	—	—	—	D	47
II	D	67	53	55	59	—	D	44	67	55	—	—	D	100	117
III	88	79	86	90	94	D	106	98	99	98	59	58	82	—	170
IV	D	113	129	122	127	—	92	114	111	126	—	—	—	—	—
V	D	142	169	170	147	—	148	167	149	157	335	271	162	106	93
Unoccupied	E	737	E	E	45	—	—	—	—	—	—	—	—	—	—

D and E indicate deficit or excess when there are fewer than 20 deaths recorded.

England and Wales for 1949-50. When this was compared with the bronchitis figures there was a significant correlation between it and the bronchitis death rates for men aged 45-64 in county boroughs for 1947-8 ($r = -0.65 \pm 0.12$). Many factors are reflected in this measure, but it does show that there is still at the present time a correlation existing between bronchitis deaths and conditions grouped vaguely as "socio-economic."

Region and Degree of Urbanization

The highest death rates from bronchitis are experienced in the northern and western parts of England and Wales (see Table IV and Fig. 3). The conurbation of South-east

TABLE IV.—Bronchitis Deaths, 1950. Rates per 10,000 per Year

Standard Region	Age 45-54		Age 55-64	
	M	F	M	F
England and Wales	10.8	2.5	43.0	15.8
Northern	13.2	3.2	40.5	18.7
Tyneside conurbation	18.8	3.3	63.8	28.1
Remainder	11.2	3.2	32.3	15.2
E. and W. Riding	13.6	3.3	56.1	18.7
W. Yorkshire conurbation	15.0	4.1	63.3	19.8
Remainder	12.6	2.5	50.8	17.8
North-western	16.4	4.7	61.7	26.0
S.E. Lancs conurbation	20.8	6.2	77.8	34.4
Merseyside	15.7	3.2	64.6	19.6
Remainder	12.9	4.0	47.1	21.5
North Midland	8.6	2.2	42.8	11.2
Midland	12.8	2.2	45.9	18.3
W. Midland conurbation	16.1	3.4	56.2	22.6
Remainder	9.5	2.1	36.6	14.1
Eastern	5.9	1.1	24.4	12.3
London and S.E.	9.0	1.8	40.5	13.8
Greater London	9.9	1.9	46.6	8.6
Remainder	5.9	1.3	24.5	8.7
Southern	5.4	1.3	25.7	10.3
South-western	6.4	1.4	25.9	18.5
Wales	12.2	2.4	46.9	22.2
Wales I	14.0	2.7	51.5	22.2
Wales II	7.6	1.8	37.1	11.4

Lancashire has the highest rate (20.8 per 10,000 men in the 45-54 age group), which is almost four times the rate for the southern region (5.4 per 10,000). How far this difference is attributable to geographical conditions and how far to urbanization it is impossible to say.

Urbanization has repeatedly been shown to influence deaths from chronic bronchitis, and the latest figures confirm previous experience. The highest death rate from bronchitis in both sexes and at all ages is experienced by those living in "conurbations." There is a progressive decline in the death rate with the size of the towns, and the lowest figures are found in the rural areas (Table V, Fig. 4).

TABLE V.—Bronchitis and Degenerative Heart Diseases, 1950. Death Rates per 10,000. (Age 45-54)

	Bronchitis		Degenerative Heart Disease	
	M	F	M	F
England and Wales	10.8	2.5	7.4	5.2
All conurbations	13.7	3.1	6.9	4.3
All conurbations excluding Greater London	17.5	4.4	9.1	6.1
Urban areas with population of 100,000 and over	12.2	2.7	7.8	5.7
50,000 and under 100,000	10.6	2.6	8.9	5.7
Under 50,000	9.5	2.3	8.3	6.1
Rural areas	5.5	1.3	6.8	5.3

The ratio of male to female death rates does not appear to vary much for the varying degrees of urbanization, but does differ between the different standard regions, the north-western having the lowest ratio 3.5, for age 45-64, with North Midlands very near (3.8), and, at the other end of the scale, London and Wales each with a ratio of 5.1 and the eastern region with 5.4.

"Degenerative heart diseases" do not show such a consistent fall in rates with a decrease in size of town, but those living in conurbations (excluding Greater London) have the highest risk and rural areas the lowest risk of dying from these causes (Table V).

Atmospheric Pollution

Stocks (1947) drew attention to the inverse relation that existed between hours of sunshine and bronchitis death rates. He pointed out that smokiness of atmospheres, the shorter day, and the excess of cloud are all cumulative and affect northern towns particularly. Attention has been drawn to the relationship between atmospheric pollution and death rates from respiratory causes in many papers, such as those by Mills and Mills-Porter (1948) and Herring-ton and Moriama (1939), but in all these studies the areas with the worst pollution are also those with lower social and economic standards.

There is ample evidence that atmospheric pollution may be responsible for the deaths of many who suffer from

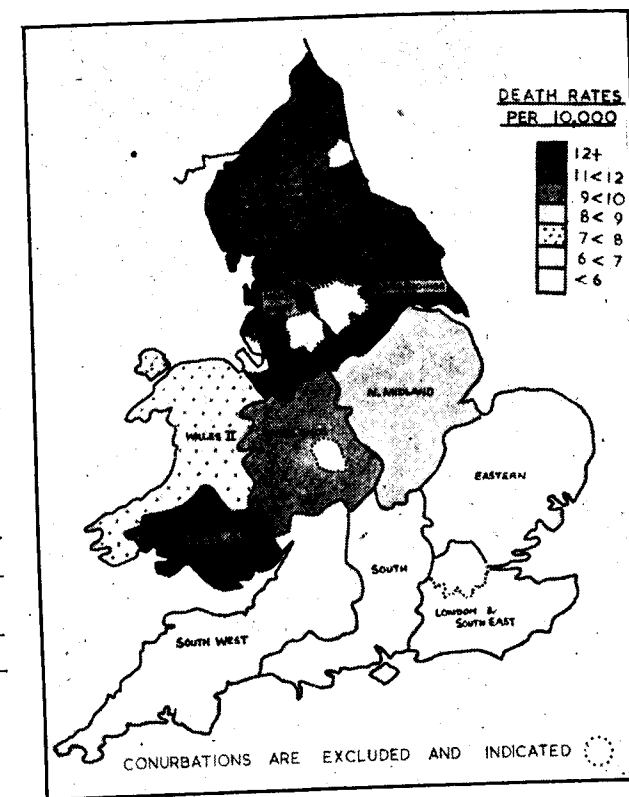


FIG. 3.—Bronchitis death rates in regions, 1950. Men aged 45-64 years.

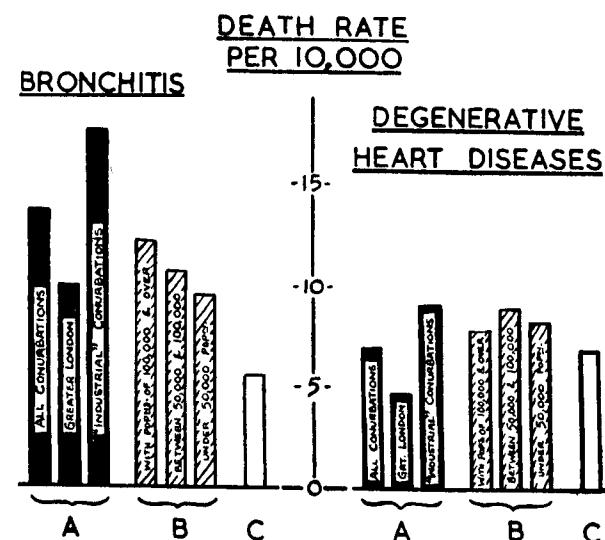


FIG. 4.—Distribution of deaths from bronchitis and degenerative heart diseases according to degree of urbanization, 1950. Men aged 45–64 years. A=Conurbation. B=Urban districts. C=Rural districts. ("Industrial" conurbations are: S.E. Lancs, Merseyside, Tyneside, W. Yorkshire, and W. Midlands.)

chronic respiratory and heart disease. The Meuse disaster in 1930 and the Donora Valley incident of 1948 are widely quoted. The extensive official report of the Donora episode shows that over 40% of a population of 14,000 were in some way affected, but that all but 1.7% were quite well within a week of the fog lifting. It was those who suffered from long-standing respiratory disease who were more likely to be killed or incapacitated for long periods. London has long provided examples of the results of the lethal nature of severe fogs, which may give a death rate of the same order as that experienced in the severest epidemics (*British Medical Journal*, 1953). The recent London fog was responsible for 6,000 deaths, most of which were in the age groups above 45.

It may well be that exposure to continuous but much less severe atmospheric pollution, such as is experienced in many of our large towns, contributes to the high death rate from chronic bronchitis of those who live in industrial towns, but no evidence is available which makes it possible to be certain of this point.

At the other end of the scale, the Scandinavian countries, with a dry atmosphere little polluted by smoke, record very few deaths from bronchitis. For example, in 1948 the death rates per 10,000 from bronchitis in these countries for the age group 50–60 years were:

	Males	Females
Norway	0.2 (5)	0.4 (7)
Sweden	0.4 (25)	0.2 (12)
England and Wales	17.8	4.5

The actual numbers of deaths in the Scandinavian countries are given in parentheses.

The actual number of deaths were small in the Scandinavian countries, but when all respiratory deaths (excluding tuberculosis and carcinoma of the bronchus) were considered together there was still very little difference between Norway and Sweden or between men and women in these countries, whereas this country's rates were much higher (Table VI).

TABLE VI.—All Respiratory Deaths (Excluding Tuberculosis). Rate per 10,000

Age	Norway		Sweden		England and Wales	
	Men	Women	Men	Women	Men	Women
40–49	1.8	1.9	1.1	1.1	5.2	2.4
50–59	4.4	3.3	3.6	2.1	17.4	5.4
60–69	11.9	9.3	8.1	7.1	46.0	14.3
70–79	39.5	44.3	26.0	30.6	80.3	43.0

It is possible that deaths from chronic respiratory disease were certified as cardiac deaths in Scandinavian countries. Examination of the figures shows this cannot affect the relative positions to any large extent, as the rates for death from heart disease are lower in Norway and Sweden than in this country.

Occupation

(The latest figures are for 1930–2—that is, when there was some overlap between respiratory and myocardial causes of death. There is a significant correlation between the standardized mortality ratios for bronchitis and for myocardial disease for the different occupations, $r=0.68$; $P<0.0001$.)

TABLE VII.—Occupational Distribution of Bronchitis Deaths, 1930–2. Males Aged 20–65. (All Males=100)

Social Class III		Social Class IV		Social Class V	
Ratio		Ratio		Ratio	
Coal hewers and getters	170	Metal grinders	222	Costermongers, newspaper sellers	230
Metal moulders and diecasters	169	Road transport—horse-drivers	205	Messengers, porters, etc.	203
Furnacemen, rollers, etc.	163	Iron and steel foundry furnace-men and labourers	179	Water transport, dock labourers	199
Masons, stone-cutters	147	Coal workers, above ground	172	General labourers, etc.	187
Cotton-spinners	132	Coal—others below ground	143	General unskilled workers, etc.	176
Warehousemen, storekeepers	118	Textile dyers	140		
Salesmen of meat, greens, etc.	117	Coal—conveying to shaft	135		
Paper-hangers, painters, etc.	111	Sawyers and wood turners	128		
Boiler-makers, etc.	108	Coal workers below ground	126		
Hairdressers, etc.	107				
Boot factory workers (skilled)	103				
Boot-makers and repairers	102				
Tailors, etc.	100				
Cotton-weavers	97				
Bricklayers	94				
Smiths and skilled forge-workers	92				
Total of all in Social Class III	91	Total of all in Social Class IV	124	Total of all in Social Class V	156
Stationary engine drivers	89	Fitters' labourers, etc.	123	Builders' labourers, etc.	133
Filters, mechanics, etc.	81	Metal machinists	111	Railway porters	117
Postmen and sorters	80	Coal workers—roadways	102	Other workers, navvies, in building	74
Domestic servants (indoors)	73	Boiler firemen and stokers	93	Agricultural labourers	52
Typists and other clerks	71	Platelayers	90		
Bakers and pastry-cooks	67				
Carpenters	65				
Road transport—motor-drivers	64				
Railway engine drivers, etc.	60				
Civil Service typists and clerks	54				
Gardeners, nursery-men, etc.	51				

The standardized mortality ratios for bronchitis for different occupations are given in Table VII. Owing to the great differences between social classes the occupations have been grouped into their respective classes. Dusty trades were high on each list, and the figures for 1930–2 almost certainly will include cases of pneumoconiosis, which were not at that time diagnosed with the same accuracy as to-day.

Predominantly outdoor work does not seem to have an adverse effect. Gardeners, agricultural labourers, railway porters, builders' labourers are all below their own social class averages. Sutherland (1947) reached a similar conclusion. It must, however, be remembered that these figures are based on the occupation as given on the death certificate, which may not be the predominant occupation of the individual's working life. This was especially likely to apply in the 1930's. Moreover, the existence of chronic bronchitis may have driven men from work involving heavy physical labour either to lighter work or, more usually, to no work at all. The very high death rate from this cause among unoccupied males probably reflects this result of the disease.

II. SICKNESS

Little information is available on the incidence of sickness from chronic bronchitis. Inquiries made by the Social Survey in 1951 suggested that 16.5% of the total days lost from sickness by those aged 21 and over resulted from respiratory complaints* (this excluded 23% due to colds and influenza) (Table VIII).

TABLE VIII.—Social Survey—Survey of Sickness, 1951. Total Days Lost Each Month. Age 21 Years and Over (4,000 Persons Interviewed Each Month)

Month†	Males			Females		
	All Illnesses	Colds and Influenza	Respiratory Diseases‡	All Illnesses	Colds and Influenza	Respiratory Diseases‡
January	8,384	3,764	1,336	11,333	6,267	2,078
February	6,546	2,671	1,137	7,669	3,038	1,635
March	5,077	975	1,185	5,094	1,311	990
April	3,941	329	820	3,529	378	470
May	3,487	238	630	3,116	230	334
June	2,484	99	245	2,944	80	318
July	2,831	63	289	2,505	88	204
August	1,414	27	205	954	63	37
September	1,173	53	110	1,440	143	184
October	2,732	238	300	3,534	576	440
November	3,664	317	663	3,506	433	640
December	3,453	458	690	4,317	624	1,016
Total	45,186	9,232	7,590	49,941	13,231	8,346
Total, incl. Aug. and Sept. twice (percentage of all illnesses)	47,773	9,312	7,905	52,335	13,437	8,567
		20	17		26	16

† Based on interviews in the two following months except for August and September, when, owing to the General Election, there were no interviews in October.

‡ For list of diseases included, see footnote on this page.

In a survey of illness in general practice Pemberton (1949) found that in Sheffield bronchitis was the commonest cause for which a doctor's advice was sought. In the eight practices examined it accounted for 13% of consultations in a week in winter and 7.6% in a summer week. Pemberton (1952) reported that in three Sheffield steel-works employing 9,970 men bronchitis accounted for 13% of all medically certified illness over the period January–June, 1949. In a factory in the Manchester area employing some 1,700 employees this percentage was 14.5. Using data from Raffle (1951), we estimated that 13,000 man years are lost annually in England and Wales from bronchitis.

Sex Differences

What little information there is suggests that the male mortality excess from this disease may not reflect its true sex incidence. In fact the Social Survey found in 1951 that of all days lost during the years through illness the women lost more through respiratory complaints than the men (Table VIII). The women seemed to have shorter and more frequent attacks than the men. For women not going to work the criterion of "days lost" is taken to mean the number of days on which they were prevented by the illness from going out of doors. These figures are open to criticism, since they are based on interviews in which information was sought about the illnesses and days of incapacity experienced during the preceding two months and the cause of such illness is that given by the informant.

In the Statistical Report of the Health of the Army 1943–5 (1948) it was found that in 1943–4 the percentage of A.T.S. admitted to hospital for bronchitis, when standardized for age, was higher than that for soldiers, whereas the percentage of cases requiring discharge from the Army was much higher for men than for women. This report dealt, of course, with a highly selected group of both men and women, but it comments: "This difference between

*Acute sinusitis; laryngitis and tracheitis; acute upper respiratory infection of multiple or unspecified sites; pneumonia; bronchitis; other respiratory diseases (excluding hypertrophy of tonsils and adenoids).

discharge and morbidity sex differentials suggests that (a) the incidence of the more serious type of bronchitis—namely, cases leading to discharge—is higher among men, and (b) the reverse is true of the milder cases that do not involve discharge." Of all military discharges (category E) for 1943–4, 50% were due to bronchitis.

In a survey of respiratory illness in Corby in 1949, Sutherland and Wilson (1950) concluded that "the incidence of respiratory illness among women aged 15 to 44 was double that reported by men."

There is very little information on sickness among women over 45 years of age. Firms keeping records of certified sickness absence for men and women doing similar work find that women have from two to three times the men's rate, age being comparable, for absence due to bronchitis as well as that due to all certified sickness. It must be remembered that this is a comparison of sickness absence, and that economic and social conditions may make absence from work more necessary or perhaps easier for a woman than a man. It is difficult, however, to believe that these factors would change a two to three times male excess, as seen in the mortality figures, into a two to three times female excess for sickness.

Occupation

There is very little information on the effect of occupation on sickness due to bronchitis. Bradford Hill (1929) examined the sickness experience of printers from 1921 to 1925 as given by the records of approved societies, and in the next year he also examined similar figures for operatives in Lancashire cotton-mills for 1923–7, which was repeated 10 years later by Harvey (1939). The number of days' sickness per person per year from respiratory causes (excluding colds and respiratory tuberculosis) are shown in Fig. 5. This chart also gives the recent post-war experience

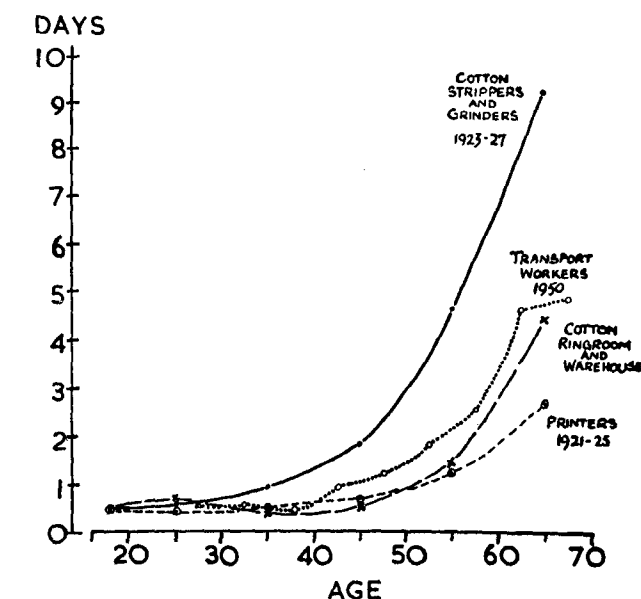


FIG. 5.—Sickness from bronchitis and other respiratory disease (excluding respiratory tuberculosis, colds, etc.) in males. Number of days' sickness per person per year. Printers and cotton workers from Bradford Hill (1929, 1930), transport workers from Raffle (1951).

of a group of transport workers (Raffle, 1951). It will be seen that those exposed to cotton dust (strippers and grinders) begin to show an increase in lost time from respiratory causes at a much earlier age than those not exposed to dust. It must be pointed out, however, that cotton dust is known to be irritating. Figures are not available to show the effect upon sickness rates of bland or inert dusts, though it has long been held that "dust which impairs the vitality of the lungs predisposes to tuberculous infection . . . and . . . to other respiratory disease" (Collis, 1923).

Disablement

The survey of registered disabled persons to which reference has already been made was carried out in four regions—London, Midlands, North-west England, and Scotland. In the north-western region not only was bronchitis the largest single disease group encountered (with the possible exception of skeletal conditions) but it accounted for more unemployment at all ages and social levels than did any other physical condition. In the sample of 1,184 drawn from this area there were 124 patients with chronic bronchitis of whom 24 (20%) were unemployed. The prospects of employment for men who were severely disabled by bronchitis did not appear to be influenced by the possession of manual skill—this was in marked contrast to general experience. Those with bronchitis who were unemployed at the time of the interview had often undergone a steady decline in social status since becoming disabled. The frequent winter exacerbations of their disease and the necessary long absences from work made them very uncertain employees. It was estimated that 42% of those with bronchitis were severely incapacitated for any type of work, whereas only 23% of the rest of the sample were disabled to a similar extent.

DISCUSSION

While the facts given above are of interest the reasons for them still remain obscure, and much of what follows is but surmise.

Sex Difference

The reason for the male mortality excess from chronic bronchitis is not clear, and is made more difficult to understand by the apparent excess of respiratory sickness among women. The observation that chronic bronchitis takes a more serious course in men is confirmed by Fulton (1953), who has found that in a series of deaths from cor pulmonale in a Manchester hospital over 90% were in men. This sex difference in bronchitis may be due to hormonal or other constitutional differences, so resembling rheumatoid arthritis and coronary disease in its predilection for a particular sex. The fact, however, that this difference is not observed in the Scandinavian countries may be an argument against such an explanation. It might, however, be explained by the different work habits of men and women. Comparatively few women work for long periods in cold, rain, fog, and dust. Nor is there the same economic urge for them to return too early to such conditions following acute respiratory infection. Physical effort carried out during or immediately after an acute respiratory infection may also be a factor in the different sex incidence. For the most part men of social classes III, IV, and V do heavier physical work than women. It is likely that this heavy exercise and the heavy breathing it induces may produce excessive stretching in lung tissue still abnormal as the result of recent infection. The fact that those conurbations where it is the custom for married women to go out to work show a lower sex difference than in those where most married women stay at home supports this hypothesis.

Smoking may also be a factor in producing this sex difference. In a series of 50 male patients with chronic bronchitis seen clinically in the north-western region almost all had been cigarette smokers. A number regard the pre-dyspnoeic stage of their bronchitis as a "smoker's cough." Most of them had continued to smoke except during the more acute exacerbations of their disease, and many had ultimately to cut it down or give it up completely.

If these surmises are in fact correct, one might look for a narrowing of the gap between male and female deaths from chronic bronchitis in the next 20 years, first, because of the reduction in physical work required of the modern workman on account of increased mechanization; and, second, because the smoking habits of the sexes have undergone a change.

Social and Economic Factors

Many writers have emphasized the importance of social factors in the aetiology of chronic bronchitis. Overcrowd-

ing and cross-infection, malnutrition, and inability to treat early respiratory infections with enough care may all play a part. In most working-class homes it is impossible to treat a serious respiratory infection with the respect it deserves, and the cross-infection and re-infection that ensue among many of these families is familiar to most general practitioners. Douglas (1951) found that lower respiratory tract infection in the first six months of life was four times as great in the infants of manual workers as in those of professional and salaried classes, and he attributes this to "the general pattern of their living as well as their home conditions."

The greatly improved nutrition of the children of social classes IV and V, and the remarkable reduction in overcrowding reported by the Registrar-General (1952) in all our slum areas, may do something to reduce the excess of this disease among these social classes in the future.

Urbanization and Location

It is difficult to separate the effects of socio-economic factors and those due to urbanization and location. Living in a town involves more opportunities for cross-infection during entertainment and travel. It is not unlikely that pollution of the atmosphere from small amounts of coal dust and sulphur dioxide has an irritating effect on the respiratory tract. There is no doubt at all that smoke associated with fog has a serious effect on the elderly and the chronic bronchitic in precipitating a mortal bronchopneumonia. Part of the excess of deaths in the poorer classes may be accounted for by their living in a more heavily smoke-polluted atmosphere.

It is not easy to be sure of the importance of location, because the industrial towns, with their crowding and heavy atmospheric pollution, happen to be situated very largely in the north and west. It is true that the rural areas of the north and west show higher figures than the rural areas of the south and east, but this may be due to contamination from nearby industrial areas. It seems probable, however, that the humidity of these parts, particularly when it is accompanied by smoke, has a bearing on the incidence and course of chronic bronchitis in the north-west. The strikingly low mortality rate from this disease in the Scandinavian countries, where a much drier as well as cleaner atmosphere is enjoyed, supports this view.

Disablement

The serious nature of this disease is shown by the high incidence of disablement among its victims. At a comparatively early stage they may become incapable of heavy physical effort, and winter exacerbations make them unreliable workers throughout the winter months.

Little can be done to help the patient with established emphysema, and any hope lies in prevention. While the social and occupational factors are slowly being mitigated it would seem that the general practitioner has an important part to play in reducing this disablement. The modern range of antibiotics have provided him with a means of giving effective treatment for the acute respiratory infections, and the National Health Service has made the full treatment of these conditions freely available to everyone. It would also seem to be important to persuade the man whose job involves heavy physical effort or exposes him to fog, cold, or dust to delay his return to work until his chest has fully recovered from acute pulmonary infection. By such measures fewer bronchitics may pass into the chronic stage and their deterioration may be retarded.

CONCLUSION

For many years this crippling disease has been complacently accepted, and the "cough bottle" has been one of our national institutions. The problem is one of great complexity. A logically planned attack upon it cannot be made until more is known of the weight to be given to various aetiological factors. Further investi-

gations planned to throw light on the different incidence of the disease in the two sexes might give a useful lead in such a study. Long-term studies of the natural history of the disease are already in progress and are likely to give information on the importance of certain occupational factors.

It is certain, however, that the problem is too difficult to be solved by a piecemeal approach. What is needed is a well-planned and co-ordinated attack by experts from various fields. Quite apart from humanitarian consideration, the economic loss resulting from this disease calls for immediate action.

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THE PLACE OF THE HOSPITAL IN A NATIONAL HEALTH SERVICE*

BY

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Administrative Areas

Our next problem in a combined service is the areas to be covered and the populations to be served. Many think that there are too few regional hospital boards and that the original conception of between 30 and 40 would have been better. This might have avoided the expensive administrative set-up of hospital management committees and also have avoided the friction which tends to develop between the boards and the management committees. There are, however, obvious advantages in linking hospital boards with teaching hospitals, though some may say that the disadvantages outweigh them. The location of the university medical schools, placed where they are for entirely different reasons than to be the nucleus of a national health service, certainly caused grave difficulty when the boundaries of the 14 regional boards were being settled. It is clear that if there were a combined service a much larger number of areas than 14 would be needed. There are 145 local health authorities and about the same number of executive councils. In any organization of a combined service, the hospital areas would have to coincide with those of local authorities, many of which would have to be associated with their neighbours for the purpose of making an adequate area for hospital planning—generally regarded as one

*The second of the Croonian Lectures delivered before the Royal College of Physicians of London on July 9.

to serve at least one million people. This coincidence of boundaries of responsibility would in itself greatly facilitate co-operation between the hospital services and those of local government.

It is the dream of many to restore hospital provision to local government. With salaries and conditions of service for hospital staffs fixed centrally and specific regulations made concerning the method of appointment of consultants, the main objections to this are not nearly so strong as in the past, but, without ruling it out, I will not discuss it further, as it hinges on the relationship between the finances of central and local government and on a complete reform of the boundaries of local government areas, involving inevitably the disappearance of many of the smaller local authorities. The emotional reaction to any such proposal is infinitely greater even than that evoked when it is proposed to close a small hospital. Parliament is unlikely, in the foreseeable future, to tackle such a thorny and controversial subject.

My conclusion, therefore, on the questions of a combined service, and whether it should be administered by nominated or elected bodies, is that the practical difficulties of making any radical change, particularly at this stage, are insuperable, but it is not beyond the realm of realism to go back to the "Willink" proposals so far as the number of hospital boards is concerned, and this would ensure a much closer association with the other two branches of the service—the local authorities and the executive councils.

Why Does the State Charge Itself with the Cost of Hospitals?

In the meantime, it behoves us to look again at the administrative structure as it exists to-day and try to determine what is the proper function of a hospital in a national health service. In the first place, we must remind ourselves that Governments do not pour out vast sums of money because they are sorry for sick people. They do so because there is a national insurance scheme which pays out money to people who cannot work because of ill-health and to the dependants of those who die, and also because the Government needs for the well-being of the nation, in peace or in war, the productive capacity of all its nationals who are able to work.

The first National Health Insurance Scheme provided from 1913 a general-practitioner service for insured persons. It was for the dual purpose of providing treatment so as to get the insured persons off the funds and back to work again as soon as possible and also to provide responsible certifying officers for sickness and disablement benefit. Sir William Beveridge, as he then was, said in effect in his report of 1942 (Beveridge, 1942) that if his scheme, which provided larger benefits, was to be successful a comprehensive medical service available to all, free at the time the service was needed, was essential. The link, again, is with the payment of cash benefits.

The objectives of the Service are, primarily, to maintain the health of the community, to prevent disease, and to restore to good health as soon as possible all those who fall ill. That the Service also relieves suffering and prolongs the life of the aged is incidental, as, collectively, whatever their private feelings, Governments, as such, are not sentimental.

Prevention of Illness and Speedy Restoration to Good Health

The insistence on prevention of illness and a speedy restoration to good health of those who fall sick as a major responsibility of a national health service is no new idea of my own. It is the thread running through the recent book

of Sir James Ross (1952). Even in the training of nurses the Working Party reporting in 1947 (Nurses, 1947) stressed the need for giving more attention during training to "modern ideas of social and preventive medicine." The British Medical Association (1930) in its proposals for a general medical service for the nation gave as the first of its fundamental principles "that a satisfactory system of medical service must be directed to the prevention of disease no less than to the relief of individual sufferers."

Owing, no doubt, to the inadequate attention paid in the past to the importance of preventive medicine in the training of the medical undergraduate, there is a tendency among many workers in the clinical field to take little or no interest in preventive medicine or, if they think about it at all, to leave it to "the public health people." I shall endeavour to show that it is the bounden duty of every doctor, particularly those working in a national health service, himself to participate in the practice of preventive medicine so far as it relates to his own patients, and that without the close co-operation of those whose major interest is curative medicine the preventive medicine specialists cannot do their job properly.

Hospitals and Preventive Medicine

There is a considerable body of support, particularly in the U.S.A., for hospitals taking a more active part in preventive work. Dr. Stanhope Bayne-Jones (1949) said "hospitals should become increasingly houses of prevention instead of houses of pity." He quotes the report of the Committee of the New York Academy of Medicine on "Medicine and the Changing Order," published in 1947, to the effect that "the whole perspective of hospital care should be enlarged to include preventive as well as curative care." He lists a number of special activities of a preventive nature which hospitals should provide. They include diagnostic and consultation clinics available to all, clinics for periodic health examinations, and child welfare and child development clinics. He also quotes Corwin, who wrote in 1946: "Hospitals and their out-patient departments are increasingly being looked upon as strategic centers for all health service activities."

The late Viscount Dawson wrote in an American book (Bachmeyer and Hartman, 1948) on hospitals: "For 25 years or more the idea has been spreading that the practice of medicine should be occupied not only with those disabled by sickness or accident but also, if not primarily, with the building up of health, and that for the extended purpose our medical services have become too haphazard and inco-ordinate in their arrangement. In other words, organization has not kept pace with ideas."

Writing in the same volume, Dr. James A. Hamilton, the then President of the American Hospital Association, says of his own country: "This disjointed conglomeration of health agencies is uneconomic, duplicating, and wasteful. The high quality of medical care cannot be maintained and the volume of health services cannot be adequately extended to the great mass of the people if such isolationism is allowed to continue in its present form"; and Dr. I. S. Falk, after pointing out that, with our present lack of knowledge, most sicknesses and most deaths cannot be controlled in the sense of preventing their occurrence, says: "These diseases which we cannot wholly prevent need early detection and accurate diagnosis and the patients need prompt and comprehensive care. . . . The principal import of these contentions is that medical care must be regarded as an integral part of a broad programme of public health."

Boudreau (1934) says: "It is in the out-patient department that the closest approach is made to incipient disease, and it is here that the somewhat arbitrary distinction between curative and preventive medicine loses its force." But he adds that "a hospital cannot function properly as an instrument of prevention unless its staff knows, lives, and breathes in an atmosphere of prevention," and "the hospital must be integrated with all the other health services of the community, which should fit together and be adapted and regu-

lated to each other like the wheels of a watch. . . . It must be fitted into the community; the community cannot be changed to suit the hospital."

Sir Arthur Newsholme (1932) says: "The history of hospitals is one first of care for the sick, then with advances in medicine and surgery, of increasing care, and lastly of prevention. The last stage now overlaps with the needed care and cure."

A more recent writer, Professor H. W. C. Vines (1952) says: "Apart from the curative treatment of the already ill, the acute hospital, as part of the local community, should now be developing a functional part in the prevention of disease as in the more distant future its activities may have to be considerable." At the recent International Hospital Congress he developed this theme and said: "The real future of the hospital service may well come to lie not in the wards but in the polyclinics, and it is these which must gradually become the major centres of practical preventive medicine."

Dr. Malcolm T. MacEachern (1935) lists the four primary functions of a hospital as: (1) care of the sick and injured; (2) education of physicians, nurses, and other personnel; (3) prevention of disease and promotion of health; and (4) advancement of research in scientific medicine. He adds, "In the out-patient department especially, there is an extensive field for the teaching of hygiene, an opportunity which should not be neglected. The hospital should take leadership in educating the public individually and *en masse*." Dr. Edwin Crosby puts number three rather differently when he says (International Hospital Federation, 1953) that one of the functions of a hospital is "to foster and promote the public health and preventive medicine programs of the community."

The Commission on Hospital Care in the U.S.A. (1947) reported that "general hospitals should co-ordinate their efforts with those of other community agents concerned with the prevention and treatment of disease, and, when conditions permit, the general hospital should serve as the focal point through which the health service of the community is integrated. . . . Hospitals should participate in community-wide educational programs, thereby assisting the public to obtain a full understanding of the importance and methods of obtaining a high level of health. . . . Hospitals and health departments should co-ordinate their efforts and integrate their functions. . . . There should be a close relationship between hospitals and public health departments so that the educational activities can include training in public health work. . . . However, the gap between curative and preventive medicine is constantly narrowing. It appears important for the physician to give more and more of his attention to preventive measures and to the maintenance of the health of his clients. . . . The public health department is the logical agency to direct such programs. . . . But, physicians, hospitals, and public health departments should pool their efforts by integrating the functions of preventive and curative medicine in order to serve more effectively the health needs of the whole population."

It is striking that these expressions of opinion come mainly from the U.S.A., where the provision of medical care is still regarded as a matter for the private individual and not, as here, a public responsibility.

Interest in the Subject

It is an indication of the great interest now being taken in this subject that, at the Eighth International Hospital Congress just held in London and attended by representatives of over forty nations and from whose transactions I have already quoted, the central theme was "preventive medicine as a major function of the hospital and its implications."

The above quotations may lead some to the thought that the hospital should become the centre of gravity of the preventive health services, and it is well, therefore, to note

some opinions to the contrary. For example, Dr. Van den Berg, a representative of the World Health Organization, said (International Hospital Federation, 1949): "Hospitals should concern themselves with the treatment of patients and it is difficult to combine this with the direction of preventive measures as a whole. . . . But, preventive and curative medicine are connected. . . . They blend in fact. . . . Much curative treatment is . . . a part of secondary prevention: that is to say, in which the object is not to prevent disease but to ensure that an existing disease is not aggravated and does not cause permanent illness or mental incapacity. . . . Hospitals play an important part in this extensive field of secondary prevention and, although, in my opinion, they cannot form the centre of the health organization on the one hand, on the other, they cannot lose their touch with it entirely." At the same congress Dr. Charles Maitland (England) said: "We must not regard hospitals as institutions that can be expanded indefinitely. We must ask, Why are people in hospitals and need they be there?"

Again, Miss Florence Nightingale (Cook, 1913) is recorded as saying "that hospitals are, at best, only a necessary evil: a necessity, as someone has said, in an intermediate stage of civilization. The secret of national health is to be found in the homes of the people."

Finally, Sir Andrew Davidson (1952) said: "My considered opinion is that the emphasis must be on the domiciliary health services through the co-operation of the family doctor and the health service of the local authority. The rising cost of hospital care—if nothing more—is forcing more attention to be paid to the preventive health services." Dr. G. E. Godber (International Hospital Federation, 1953) said: "It is not the specialized hospital services which should control the others, rather it is the needs of the others which should largely determine the form which hospital services should take." And, he added, "The medical officer of health, who is the most valuable co-ordinating influence in the whole health service, should be confident that in the hospital he has an ally, second only to the family doctor."

The above quotations, and they are but examples of many more, have been introduced to make it clear that during the past few years many people both here and in America have been thinking about the future of hospitals and the part they should play in promoting good health and preventing serious disease.

Hospital Costs

With the increase in scientific aids to diagnosis and advances in techniques of treatment, hospitals require more staff of all grades, and hospital maintenance costs, as already mentioned, are rising. Staff salaries tend to increase and hours of duty to decrease. In the U.S.A. and in Australia nurses now work 40 hours a week. In considering the place of the hospital in a national health service the question of the actual cost of the hospital section of the service and its relation to the total cost of the whole service become important. The last figures published for the whole service are for the financial year 1950-1 (Ministry of Health, 1952). I have rounded the figures to the nearest thousand.

	Thousands	% of Total
Hospitals: capital ..	11,123	2.9
maintenance ..	213,483	55.0
General medical services ..	42,072	10.8
Pharmaceutical ..	34,810	9.0
Dental ..	40,337	10.4
Ophthalmic ..	19,572	5.0
Local health authority services (50% grant) ..	15,621	4.0
Other ..	11,261	2.9
	388,279	100

The actual costs for some of the services for 1951-2 are now available (Accounts, 1951-2). The expenditure on hospitals, on both capital and maintenance, is slightly lower than in the previous year. Pharmaceutical costs rose by

over £10,000,000; those on dentistry fell by nearly £9,000,000, and on ophthalmic services by nearly £11,000,000. Medical services cost the same, but the Danckwerts award of some £10,000,000 a year, apart from arrears, had not been implemented until after the financial year. In 1950-1 the local health authority services cost public funds double the figure given above, which is the cost to Government funds. The other half is found from the local rates. I am confident that argument will never cease on whether or not the allocation of the total budget is in the best interest of the community, and I do not propose to enter the lists, though many will, no doubt, soon be jousting before the Guillebaud Committee. But perhaps I might add the words of the cynic, "Extravagance is other people's expenditure."

Other Preventive Activities of Local Authorities

For the reasons set out earlier it is impossible to calculate an accurate figure showing the proportion of the total bill for the National Health Service which is devoted directly and entirely to the prevention of disease, but there is no doubt that it is small compared with the total cost of the Service. It must also be mentioned that many quite costly services provided by local authorities under the Public Health, Housing, and Education Acts are important contributions to preventive medicine and are not contained in the accounts of the National Health Service. These other services include sewerage and drainage, provision of healthy homes, pure water, collection and disposal of household refuse, open spaces and playing-fields, pure food, safe milk, prevention of atmospheric pollution, health education, the school health service, and the work of sanitary inspectors in connexion with the control of infectious diseases. Expansion of the services for promoting the health of factory, shop, and office workers would also not be a charge on the National Health Service, but would undoubtedly pay dividends in promoting community health. The effect on health of full employment and better national nutrition must also be mentioned.

Function of the Hospital

We are now in a position to examine more closely what hospitals do, what they ought to do, and their exact place in a national health service. I think it will be agreed that their primary function is to diagnose and treat the sick. But some provisos are needed even here. They should not usurp the position of the general medical practitioner. They should be consultative for him, and patients should not be asked, or even allowed to continue, to attend an out-patient department or be admitted for in-patient treatment if the treatment can be given at home by the family doctor and the home circumstances are suitable.

Training.—But hospitals have other important functions, including the training of doctors, nurses, midwives, and medical auxiliaries of all kinds. Teaching hospitals for medical students are in a special position with regard to the admission and retention of patients, as students must be taught the ailments, both common and serious, met with in general practice. Maybe the best way to do this is to include during the undergraduate training a short period of preceptorship with an approved general practitioner. This is probably better than admitting patients who need only general-practitioner care to teaching hospitals, but undoubtedly the range of patients dealt with in a teaching hospital in both the out-patient and in-patient departments must for these reasons be much wider than if the need for hospital, as distinct from family doctor, care were the only consideration. There is an increasing tendency both in this country and in the U.S.A. to devise better methods for preparing medical undergraduates for general practice.

Care of the Sick.—I have been considering up to now the acute general hospital, whose primary concern is, and always will be, the care of those who are seriously ill, though, as discussed earlier, it has important preventive functions. But the majority of the hospital beds in this country are not in acute general hospitals but in special hospitals of all types.

Planning Hospital Services

The regional hospital boards are the planning authorities for all types of hospital, except teaching hospitals, and general practitioners and public health officers, because of their special interest in, and knowledge of, the problems concerning those whose needs are best met in special hospitals, should be more closely associated than in the past with these planning functions. These classes of patient include not only those whose admission to hospital is needed because of their home conditions and not because they are in need of specialist care, but also the chronic sick, the "fever" case, the tuberculous, the long-stay cases in children, the mentally defective, and the mentally disordered, including the mental observation ward case, to mention only some examples. Only by associating at the planning stage those vitally concerned in the other two branches of the Service can full integration be achieved and the needs of all sick people met.

Integration with General Practice

With lessened house room, more women working in industry, and perhaps a greater reluctance of young people to care for their aged relatives at home, more accommodation is needed, so that general practitioners can admit patients to hospitals where they will continue to be under their own care; and some of these hospitals should be used for the instruction of medical students. Hospitals, too, have a responsibility for providing the means by which the knowledge of general practitioners can be kept up to date. There are various ways by which this may be done, and it involves not only close co-operation by reports sent to hospital with patients and the prompt dispatch from the hospital of notes on his discharge, but making the general practitioner feel that he is a welcome and essential member of the combined team of doctors, some working inside and some outside the hospital, engaged in caring for the sick of the district.

This leads to a regret that the former "district" hospital with direct responsibility for the sick of their defined district is disappearing, with the result that the patients who are less interesting from the purely medical point of view have more difficulty than in the past in obtaining a bed. It is all to the good that no meticulous inquiry about where he lives need now be made before a patient is admitted; but when patients, whose need of admission to a hospital is clear, are refused at their local hospital and that hospital takes no step to secure their admission elsewhere, the pendulum has swung too far.

Before 1948 the publicly maintained hospitals each had a definite district for which they were responsible, and if they could not themselves make a bed for an urgent case it was the duty of an officer of that hospital to find one himself in another public hospital. It is a disconcerting fact that in some 10 to 15% of the applications for beds made to the London Emergency Bed Service a bed cannot be found immediately, and the name must go on a waiting-list, sometimes for a considerable time, and occasionally the patient is dead before a bed can be offered. When a bed is offered it is sometimes miles away from the patient's home, involving extra ambulance costs, and cost and inconvenience to the patient's relatives. This type of waiting-list is apart from the waiting-lists to which we have become accustomed for "cold surgery" and for non-urgent medical cases to which the same objection cannot be taken, though complacency about this and taking the easy road that we cannot do anything about it unless we open or build more beds is to be deplored. One would ask what steps are taken to divert them to a hospital where the waiting list is shorter. Do we not, instead, take a pride in the length of our waiting-list as a tribute to our skill and popularity?

The hopes of those who maintain that the future of general practice lies in group practice from the health centres envisaged in the National Health Service Act and in the

report of the Medical Planning Commission sponsored by the British Medical Association (Medical Planning, 1942) are not being realized because so few centres are available. The idea is still in the experimental stage, and it would be of great value if two or three such centres were placed each within the curtilage of, or immediately adjoining, a general hospital. By this method, the prospect of bringing together hospital, general practitioner, and public health clinic services might really be achieved for that locality.

The Chronic Sick

Questions concerning the chronic sick and the aged and infirm loom large in any national health service. It was given close attention by the local authorities when they were responsible for the public hospitals. Fortunately, many leaders of the profession are now also becoming interested in the problem (British Medical Association, 1947, 1948). It is realized that much can be done to prevent deformities, to restore the bedfast to ambulation and, in some cases, to their homes. The day of the large hospital for the "chronics" has, I hope, passed. All general hospitals, including teaching hospitals, should use a proportion of their beds for the more chronic type of patient "for thorough examination, and whenever possible they should provide treatment with a view to the patient's return to a useful life." The last few words are a quotation from the Goodenough Report on Medical Education (Medical Schools, 1944). When further active treatment is likely to be unavailing there should be an adequate number of "half-way" houses or "rest homes."

Again, there should be a closer association between the homes for the aged, administered by the welfare departments, and the geriatric departments of the hospitals. The geriatrician who has worked hard to restore a patient to ambulation should continue to supervise that patient even after transfer to a home for the aged. This need not interfere with the responsibilities of the general practitioner on whose list the patient is.

The senile patient who is confused in mind presents a special problem. He should not be relegated, as a certified patient, to a mental hospital but dealt with, as recommended by the Ministry of Health in a recent circular (Ministry of Health, 1950), in accommodation specially provided for this type of patient. The basis is for the patient to be investigated in a short-stay psychiatric unit in a geriatric department. For many the subsequent destination will be a long-stay annexe. Some of these may be detached buildings in existing mental hospitals but with a distinctive name and a separate entrance. They would no longer be a part of the mental hospital proper, and procedure under the Lunacy and Mental Treatment Acts would be unnecessary.

Special Hospitals

The needs of special hospitals are apt to be overlooked in the more spectacular and in many ways more satisfying work of the acute general hospitals. Mental hospitals and institutions for the mentally defective form the largest number. Though these hospitals and institutions, because of their size, the need for extensive grounds, and the statutory requirements for safeguarding the liberty of the subject, must be separated physically from other hospitals and must be, for all purposes, under medical control, yet the isolation of their staffs from the stream of current medical thought, which was common a generation ago, must be removed. A satisfactory feature of the new scheme is that it brings mental and general hospitals, and their staffs, more closely together. The increasing extent to which the staffs of mental hospitals act as consulting psychiatrists to the in-patients of general hospitals and take psychiatric clinics there and, in return, the consulting staff of the linked hospital or hospitals visit the mental hospital to advise on special cases of physical ailments, is a welcome development.

The objective should be for the same team of psychiatrists to be responsible in the linked hospitals for (1) con-

sultative work in the general hospitals, including psychiatric clinics; (2) mental observation ward work; and (3) work in the mental hospital itself.

There is little to be said about institutions for the mentally defective. It is open to argument whether there should be classification by institutions or within institutions. In the very large service with which I was formerly associated it was found to be advisable to have separate institutions for the higher-grade defective, but this is not possible everywhere. As a result of the deplorable lack of institutional accommodation many defective children have to wait long periods for a bed, with devastating consequences on the other members of the family. Mental illness is a great burden on the community, and little progress has been made in devising means for preventing mental ill-health, dealing satisfactorily with the incipient case, or preventing relapse. When sound methods are found, their application will no doubt involve close co-operation with the local health authorities.

There are many sanatoria and hospitals for the tuberculous. Though the death rate from tuberculosis is happily now declining, these special institutions are likely to remain in use for many years as more and earlier cases are being discovered. There is also an increase in the length of treatment required for the established case. There is no doubt that, when the glad day comes that all the beds available are no longer needed for the tuberculous, good use will be made of the accommodation. It is important that each physician in charge of a chest clinic should have beds at his own disposal and not simply be an out-patients physician. These beds should be in local, or district hospitals.

The incidence of the acute infectious diseases has fallen spectacularly in recent years. We cannot, however, be certain that this will continue. The virulence of the streptococcus, which was low in the days of Sydenham, high at the end of the last century and the beginning of this, and low again now, may be enhanced, and, though modern therapeutics are now available, more beds may some day be needed for scarlet fever. Many more beds are required now for acute poliomyelitis than was the case before 1947, and no one knows what new communicable diseases may appear. But, at least for the moment, the beds in the large fever hospitals cannot be filled. The small independent fever hospital cannot be justified as a separate entity. The present trend is to use large fever hospitals for other purposes but to retain a small section in single-bedded cubicle wards for such acute communicable diseases as arise. If well managed, there is, with one exception, no reason to fear the spread of infection to other wards. The exception is smallpox, for which special provision is essential. The earmarked accommodation must always be ready to be opened and a well-vaccinated staff be on call.

With increased facilities for air-borne travel, Oriental smallpox of a virulent type is an ever-present menace. The greatest danger is the patient with the disease highly modified by previous vaccination and with an immunity which is just fading. It is not creditable to the hospital service that within the last three years eleven members of hospital staffs have died of smallpox (Glasgow, 1950; Parker, 1952). That such unfortunate events can be prevented is shown by the experience of the Metropolitan Asylums Board and the London County Council, which dealt with thousands in cases of this disease, sometimes in epidemics, sometimes in sporadic cases, without any of the hospital staff ever being infected. But disaster is averted only by constant vigilance.

A Statutory Duty

Looking at the infectious diseases problem as a whole, there is a statutory duty to notify such cases to the medical officer of health, and he must take such steps as are practicable to control the spread of these diseases. Clearly he cannot act without knowledge of the cases, and it is highly unsatisfactory that, in a sufficient number of cases to be alarming, individual hospitals fail to bring in the local medical officer of health when there is infectious disease

among patients or staff (Ministry of Health, 1953). As recommended by the Central Health Services Council and the Ministry of Health, the local medical officer of health should be a standing member of the committee, which every hospital is asked to set up, on cross-infection. Not only will this be of great value to the hospitals but it will ensure, by collaboration with the hospital staff, that his own knowledge of infectious conditions is kept up to date. This is specially important now that so many medical officers of health who were in charge of fever hospitals have been displaced.

Other special hospitals do not present the same problems of relationship to the other branches of the National Health Service, but there is the question of their relationship to the hospital service as a whole. In hospital centres, with many general hospitals, there is a place for the large special hospital—for example, for children, neurology, urology, eye diseases, ear, nose, and throat diseases, skin diseases, etc.—to which the specialists concerned from the units of the general hospitals are also attached. Such a hospital can be a centre for the training of specialists and a spearhead for research; apart from that, it is probably better not to have small special hospitals, but to have adequately staffed and equipped departments in the general hospitals, where all the laboratory and other resources are available and where consultants in all other specialties are to be found. If we could start *de novo* the ideal would be to have a large general teaching hospital with the various special hospitals grouped around it and with the "hotel-keeping" and business side under the same general administration.

Maternity

The provision of maternity beds presents a special problem. As explained previously, all three branches of the National Health Service are intimately concerned in maternity work. The trend is for women to prefer institutional to domiciliary confinement, and in one American city it is reported that 99% of the confinements occur in hospital and the other 1% in taxicabs. But in this country we are far from the stage when a bed in a maternity unit is available for every woman who would like to have her confinement there. If such beds were there, and used, the practice of the domiciliary midwife would disappear, and unless general practitioners were given access to a much higher proportion of maternity beds than at present there would be little midwifery for him to do.

A solution might be to reserve the beds in units or hospitals, staffed by specialists, for the abnormal case and for those normal cases required for the training of medical undergraduates and pupil midwives, and to deal with the other normal cases either at home where the domestic circumstances are suitable or in hospitals or homes where women could be attended by general-practitioner obstetricians or general practitioners of their choice. There would still be a place for the municipal clinic for intermediate antenatal supervision and for group instruction, including antenatal exercises.

The Clinic Doctor.—Speaking of clinics, the hospitals, so long as whole-time local health authority medical officers continue to take clinics, should make provision for antenatal clinic doctors to take some part in the work of the hospital so that their knowledge will be kept up to date. Similarly, the doctors who take infant welfare centres and work in the school health service should exchange duties with hospital staff to their mutual benefit. In several London hospitals, senior registrars from paediatric departments take infant welfare clinics while the clinic doctor attends at the hospital to do his work. Thus there is a real marriage of preventive and curative work.

Children's Long-stay Units

Another instance of the need for co-operation of the hospital service with other authorities occurs in the case of children whose stay in hospital is likely to be prolonged.

It is a great misfortune for a child to have a serious illness, but it is doubly unfortunate if, as a result of a long stay in a hospital, he is further handicapped by loss of education. It is therefore most important that arrangements be made with the appropriate education authority for teachers to be provided for all children whose convalescence, or even treatment, is likely to be prolonged. A similar problem exists in the adolescent or young adult who is preparing for an examination. Correspondence courses can often be arranged. For others, diversional or occupational therapy is increasingly supplied and should be encouraged.

Pathology and Radiology

There is little to be said about pathological and radiological aids to diagnosis. It is, however, interesting to recall that these were the great lacks when the L.C.C. took over the municipal hospitals in 1930; and I understand that the same was noticed when hospitals throughout the country, and in the small voluntary as well as the municipal, were used during the war as part of the Emergency Hospital Service.

For the smaller hospitals it is probably better to cover their laboratory needs by including them in a group with a group pathologist in charge and having on his staff experts in the subgroups—morbid anatomy and histology, haematology, bacteriology, and biochemistry—rather than expecting one man to cope with all the requirements. But the importance of close association between the clinician and the pathologist cannot be overstressed. If staff and money were available there should be an all-rounder primarily responsible for each small hospital with experts from a group or reference laboratory available.

Radiodiagnosis is not yet so highly departmentalized as pathology now that radiotherapy has separated from radiodiagnosis. The question has arisen whether or not radiodiagnosis should be provided in health centres for group practice, and general agreement has been reached that, provided there is a hospital with good radiodiagnostic facilities reasonably near, there is no need to provide it actually in the health centre.

These two departments, laboratory and x-ray, concern intimately another branch of the National Health Service—namely, the general-practitioner service. They are essential to his work. An increasing number of hospitals now allow direct access of general practitioners to these departments without requiring their patients to attend the out-patient department and be examined by one of their consulting staff. The fears that the departments would be flooded out and unnecessary examinations called for have in most cases proved to be unfounded.

Special Units

In a national hospital service, as distinct from a number of independent hospitals, special units are needed. Examples are plastic surgery, neurosurgery, thoracic (including cardiac) surgery, and radiotherapy. Here, again, it is necessary to break down isolationism and induce the staffs of the hospitals in the "gathering ground" to send their patients. This is often a slow educative process and can be done best by demonstrations at the special units and by staff visits to the outlying hospitals.

A Hospital Service

And this, perhaps, is the place to emphasize what I regard as my main theme in these lectures, which is that we are now supposed to have a hospital service. It has collective responsibility for providing a casualty service, an out-patient service, and an in-patient service for all who need them. As a unit in that service each hospital has a responsibility to all who apply to it, provided that, apart from emergencies and casualties, they are sent by their general practitioners. It is not compatible with that responsibility to decline a patient and to take no further interest in him. If, for any good reason, a hospital is unable to provide for his particu-

lar needs, it should be regarded as a duty of the hospital to which he applies or more generally to which his doctor applies on his behalf, and which represents to the applicant the National Hospital Service as a whole, to take trouble to ensure that his needs are met within the hospital service of which they are a part, and not to leave it to "somebody else"—the general practitioner, the patient himself, the M.O.H., or the Emergency Bed Service—to find a place where his needs can be met. *Per contra*, local patriotism and the belief that one's own hospital is the best in the country are grand things, but they should not run, as they have been known to do, to the extent of declining to send a patient, however "interesting" and however much he would like to stay, to another hospital where there is a special unit for such cases. This is another aspect of the "service" conception.

Then there is the relationship of the hospital service as a whole and of its individual units to the other two branches of the Service. From what has been said before, I hope that it will be agreed that there would be many advantages if all three branches were under the same administration and if the areas and populations covered by all three were the same, but there is no immediate prospect of this. Moreover, it would involve two-tier administration and control: one covering the whole area for large-scale planning and probably for financial control, and the others with suitable readily accessible local headquarters for day-by-day administration. As the day for this is in my opinion far distant, it is a challenge to those working in the Service to try to overcome the weaknesses inherent in the present administrative structure.

The committee of the Central Health Services Council, already referred to, struggled for months with this problem of the proper integration of the three components of the Service, but had to be content with general advice about the formation at local level of committees representative of the three branches. A primary duty of any administration is to consider, like the doctor prescribing a new and potent drug, the side-effects of any action about to be taken. This Service is new and potent, and many of its side-effects were not realized at the time the dose was prescribed. There are, in fact, few hospital activities which do not affect at least one of the other two branches: often they repercuss on both. Obvious examples are the opening of maternity beds or the provision of a geriatric unit, of a convalescent home or a child-guidance clinic or more beds for the mentally defective. So the first essential is free trade in information and the giving of advance information to others likely to be concerned before definitive action is taken. And this applies not only to the hospital side but to the other two as well. Formal meetings are, however, not essential for this type of co-operation. It can be done quite well on the telephone, between the three or four people concerned, and they, in turn, can consult with those in their own administration who ought to be told and would have useful advice to give. In only a small proportion of the matters under consideration will a formal meeting and discussion be needed.

One handicap to this method of ensuring smooth working is the size of the areas covered by the regional boards and, in consequence, the large number of local authorities and executive councils covered, wholly or partly, by most of them. At hospital management committee level the difficulties are not so great except in the cases of hospitals and sanatoria taking patients from a large number of separate health authorities, but even there they could be overcome.

Research

Before I close there are three other matters I would like to mention. The first is research. When I had responsibility for a hospital service I attached great importance to this, and appointed two committees—one on the general hospital and the other on the mental hospital side but with cross-representation—to encourage research in every possible way, to give advice to those who sought it, and to provide

statistical help and equipment. The members were appointed by their colleagues, and among other things were able to collate the experience of different hospitals and compare the results of different methods of treatment of the same condition. It is to be hoped that, as time goes on, a similar type of organization will develop in the present hospital system. Now that the public purse has assumed responsibility for medical treatment, the State and everyone who contributes to its upkeep has an interest in reducing the size of the bill. This means that more and more attention must be given to the reasons why people need hospital treatment. This necessitates a real interest in the matter and the making of observations which can be pieced together.

Cholera was looked upon as an "act of God," and would probably have remained as such until the germ theory was enunciated but for the famous observations Dr. John Snow made a hundred years ago. His implication of the Golden Square pump and his deduction that cholera was spread by drinking contaminated water was the direct result of careful observation, and saved thousands of lives. The keeping and collation of adequate records is essential if isolated "observations" are to bear fruit. Also, it is important to know which diseases make the greatest calls on hospital services. It will be found in the case of many such diseases that we do not know, within present knowledge, how to reduce their incidence or even to catch the patients in the early stages of the disease, when, presumably, the prospect of shorter and more successful treatment is better.

Investigations of community health in different localities in the hope that the differences will point to the aetiological factors involved is possible in a national health service, and the opportunity should not be neglected. It involves close co-operation between clinicians, statisticians, and public health workers.

Rehabilitation and Convalescence

The two remaining points have much in common. They are the importance of rehabilitation and aftercare and of medico-social work.

The days are gone when a hospital ceased its interest in a patient when he was discharged and when the physician or surgeon who sought information about the health of his patients two or three years after discharge and published it was regarded as unusually enterprising. As mentioned earlier, the State is not concerned primarily with hospitals in their humanitarian aspects but because they are the machinery by which members of the State can be restored to working capacity and so reduce the cost to the State of supporting them in hospital or at home as non-working members of the community.

Rehabilitation or reablement schemes are therefore being developed, and training in new employments when this is needed. Here, also, is yet another illustration of the need for a hospital to co-ordinate its work with that of another body—in this case the Ministry of Labour.

The question of convalescent homes and of recuperative holidays needs to be re-examined. At present, convalescent homes, of which there are not enough, are the responsibility of the regional hospital boards and no charge is made to the patient. Recuperative holidays are provided by the local health authorities, who are required by law to make a charge. In practice, there is little difference in the clinical condition of those recommended. If the doctor, either hospital or general practitioner, thinks that a convalescent case will be admitted earlier through the local authority, he will be admitted earlier through the local authority, he recommends a "recuperative holiday" unless active medical supervision and nursing care are essential. This artificial distinction should be eliminated and either hospitals or local authorities be charged with the duty of providing for both categories. A definite link, preferably under the same management, should be forged between specific hospitals and specific convalescent homes so that there may be close contact between the two staffs. Further, it should be made easier for general practitioners to get their patients away for convalescence.

Medico-Social Work

Lastly, there is the important question of medico-social work. Hospital almoners, as already mentioned, do excellent work. There is also a wide range of medico-social work done by health visitors and almoners of the local health authorities. By statute, local authorities are responsible for the provision of "aftercare" and for home nursing, and have the power, which most authorities exercise, to provide a home-help service. Through their various powers and duties, particularly in the maternity and child welfare and school health services, the local authorities possess a great store of information about economic and domestic conditions which can be placed freely and gladly at the disposal of hospital almoners. When hospital staffs and general practitioners really know the nature of the assistance which can be given by health visitors they find it invaluable and use it increasingly. The almoning and health-visiting staffs are complementary to each other, and great good can result from their acting as a team.

Summary

It is impossible to divide medicine into two compartments, preventive and curative. The interlocking is far too great.

The hospital is an essential part of a national health service, not only for the diagnosis, cure, and relief of illness, but for the prevention of illness. But the hospital is not the centre of gravity of the service any more than the general-practitioner service or the public health service is the centre of gravity.

The other two branches are equally essential, and any of the three will make a more effective contribution to the health of the nation if they work together as closely as possible, centrally, regionally, and locally; avoid any tendency to competition, rivalry, or isolationism; and listen sympathetically to suggestions, requests, or even criticisms which come from workers in the other branches.

There is only one National Health Service, not three independent components of it. It should, as a service, be founded on the basic need of preventing ill-health and reducing the number of people for whom in-patient care is essential. The ideal would be to administer the Service through one, and only one, local body, nominated or elected or a mixture of both, but the difficulties appear to be insuperable without a change in the boundaries of local government.

The individual hospitals must remember that they are part of a national hospital service with a collective responsibility for the institutional care of the sick.

The acute general hospitals are only part of the hospital service. The various special hospitals, including the mental hospitals, far outnumber in beds the acute general hospitals. The special hospitals perform functions which are absolutely essential to the welfare of the community and must receive their due share of money, staff, and prestige. The provision of hospital beds where general practitioners can attend their own patients must not be neglected.

Hospitals are primarily for the diagnosis and treatment of the sick, and for many illnesses they only can provide the necessary service. Their rising costs are a matter of grave concern. It is more important than ever before to ensure that they are used to the best advantage, that they play their part in the preventive services, and supply the "needs" of the other two branches of the Service.

The out-patient consultative departments, or polyclinics as they may be called, will probably play an increasing part in the development of the Health Service.

The hospitals, particularly those with attached medical schools and research institutions, are the spearheads of research, but a plea is made for associating with certain types of research the local medical officer of health, who is anxious to know the amount and nature of the sickness among the community which he serves. By observing "associations," as did Dr. John Snow, the causes, now unknown to us, of many diseases may be revealed.

Hospitals are the training-grounds for doctors, nurses, and medical auxiliaries. Though the training of doctors is a responsibility of the universities, and not of the National Health Service, the training given in hospitals should emphasize, by the work going on there, the interdependence of the three branches of the Service and how they work together.

I am most grateful to the College for giving me this opportunity of expressing my views on a subject which I regard as of paramount importance to the future of the National Health Service, a service which, if it does what is expected of it, will make a substantial contribution to the happiness and prosperity of the nation. I am grateful, also, to my listeners for giving me so much of their time; and to the many, too numerous to mention individually, who have helped me with advice and suggestions. I must, however, specially thank Mr. C. C. Barnard, Librarian of the London School of Hygiene, for invaluable help in looking out references.

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RELATIONSHIP OF ALIMENTARY
LIPAEMIA TO BLOOD
COAGULABILITY

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It has been clearly shown that a factor of lipid nature is essential for the normal process of blood coagulation, although its precise character has not been finally determined (Macfarlane *et al.*, 1941). This finding led us to undertake experiments designed to discover whether the coagulability of blood is altered during the lipaemia which follows the ingestion of fat. The work is conveniently divided into two parts: (1) the influence of alimentary lipaemia on prothrombin times ("accelerated clotting times"); and (2) the effect of such lipaemia on the coagulability of blood estimated in silicone-coated tubes.

1. Influence on Accelerated Clotting Time

The technique adopted was the usual one-stage method of determining the prothrombin time (Fullerton, 1940). For a reason which is referred to later, Russell-viper venom ("stypven") was used as the thromboplastin in the test. The observations may be divided into three groups.

(a) In a group of eight patients taking the ordinary ward diet, blood was removed at intervals after meals and the accelerated clotting times were determined. The fat content of these meals varied from 12 to 30 g. The accelerated clotting times showed no significant variation throughout the day.

(b) A group of five patients were given a breakfast containing 65 g. of fat (bacon, eggs, bread, and butter). The results are shown in Table I. It is seen that in each case a significantly shorter time was found at the height of the lipaemia, with an average reduction of 4.9 seconds.

TABLE I.—Accelerated Clotting Times after Fat Intake of 65 g.

Case	Fasting* (Seconds)	Time† (Hours)	Shortest Reading‡ (Seconds)	Differences (Seconds)
1	22.5	3	15.4	7.1
2	23.7	3½	19.7	4.0
3	23.0	2½	19.8	3.2
4	25.1	3	20.2	4.9
5	25.8	3	20.6	5.2
Means	24.0		19.1	4.9

TABLE II.—Accelerated Clotting Times After Fat Intake of 85 g.

Case	Fasting* (Seconds)	Time† (Hours)	Shortest Reading‡ (Seconds)	Differences§ (Seconds)
1	24.5	5	10.9	13.6
2	22.3	4½	13.4	8.9
3	23.0	3	12.8	10.2
4	24.3	2½	17.5	6.8
5	22.3	3½	14.8	7.5
6	24.7	3½	13.1	11.6
Means	23.5		13.7	9.8

* Accelerated clotting times with the patients fasting.
† Time interval at which the shortest accelerated clotting time was reached during the lipaemia.
‡ Actual reading obtained.
§ Differences between the fasting and the shortest times.

(c) In a group of six patients similar observations were made following a meal containing 85 g. of fat (two eggs, 2½ oz. (70 g.) of bacon, 1 to 1½ oz. (28 to 42 g.) of butter, bread, tea with milk and sugar). The results are shown in Table II. Again in each case a marked reduction in the accelerated clotting time is evident during the lipaemia, and its degree is much greater than with a fat intake of 65 g. The effect is probably due to an increase in the essential lipid factor during lipaemia. The other forms of thromboplastin ordinarily used in the accelerated clotting test—for example, acetone-dried extracts of rabbit brain (Quick, 1938) and viper venom plus ovolecithin (Witts and Hobson, 1940)—do not reveal this reduction during alimentary lipaemia. Presumably this is because these thromboplastins contain large amounts of lipid, so that alterations in the plasma content of lipid are obscured (Fullerton and Anastasopoulos, 1949).

It was realized that the findings set out in Tables I and II could not be interpreted as indicating that a real increase in coagulability occurs during lipaemia. The inference that naturally occurring thromboplastin is influenced by lipaemia in a manner similar to viper venom is not justified. Accordingly, similar experiments were performed using the clotting time in silicone-treated tubes as a measure of the coagulability of blood.

2. Influence on Clotting Time Measured in Silicone-coated Tubes

Method

"Teddol," a silicone-like material, was used. It reacts vigorously with water, yielding hydrochloric acid with heat evolution and a solid silicone formed by the intercondensation of the resulting hydrolysis product. Tubes measuring 3 by ½ in. (7.5 by 1 cm.) were filled with "teddol," and after ten minutes the solution was poured off and the tubes were inverted and allowed to drain for two minutes. They were then washed thoroughly in five changes of distilled water and were dried at room temperature. In estimating the clotting time with these tubes a needle, without a syringe, was inserted into a vein at the elbow and the first few millilitres of blood was run into a tube containing oxalate solution. This sample was later centrifuged, and the degree of lipaemia was estimated macroscopically. The first sample presumably contained any thromboplastin resulting from the trauma of the venepuncture. Then approximately 2 ml. was run into each of two teddol-coated tubes, and immediately these tubes were placed in a water-bath at 37° C.

Each tube was examined by tilting every five minutes, and the end-point taken was the time at which the tube could be inverted without flow of the blood. The object of using two tubes was to assess possible variations due to different degrees of silicone coating. Occasionally, if clotting appeared to be almost but not quite complete at any reading, another examination was made before the next interval of five minutes had elapsed. It may be pointed out here that the difference in the readings given by the two tubes did not exceed five minutes in any case.

Results

(a) With this technique the changes in the clotting time of whole blood were observed during the phase of lipaemia following the ingestion of a meal rich in fat (80-85 g.) composed of bacon, eggs, bread, and butter. Table III shows the preliminary results in four normal subjects. It is seen

TABLE III

Case	Fasting	3 Hours	Difference
1	mins. 25, 25	mins. 15, 15	mins. 10
2	30, 30	15, 20	13
3	30, 30	10, 15	18
4	25, 25	15, 20	8

that in each case the clotting time three hours after the meal was considerably shorter than the fasting time. Macroscopic lipaemia was present at three hours in each case.

(b) The experiment was then expanded to include readings at 3, 3½, and 4 hours after the meal in 11 subjects. The results are presented in Table IV. It is seen that in Cases 1-9 much shorter clotting times occurred following the high-fat meal. The maximal reduction varies from five to fifteen minutes and averages ten minutes. In Cases 1-9 macroscopic lipaemia was present following the meal. In Cases 10 and 11 a significant reduction in clotting time did not occur; in neither of these cases was macroscopic lipaemia observed at 3, 3½, and 4 hours after the meal.

TABLE IV

Case	Fasting	3 Hours	3½ Hours	4 Hours	Difference
	mins.	mins.	mins.	mins.	mins.
1	25, 27	20, 20	20, 23	15, 20	9
2	25, 25	15, 15	15, 15	10, 10	15
3	20, 20	10, 15	10, 10	14, 10	10
4	20, 25	20, 13	20, 15	15, 20	5
5	20, 20	10, 10	10, 10	10, 15	10
6	20, 20	15, 18	15, 12	15, 12	7
7	20, 25	10, 10	15, 15		12
8	25, 20	15, 20	20, 20	5, 10	15
9	15, 20	15, 10	10, 15	15, 20	5
10	20, 20	20, 25	20, 20	25, 20	0
11	15, 15	15, 15	12, 10	10, 14	4

TABLE V

Case	Fasting	3 Hours	3½ Hours	4 Hours	Difference
	mins.	mins.	mins.	mins.	mins.
1	15, 15	15, 20	15, 15	15, 15	0
2	15, 15	15, 20	15, 15	15, 15	0
3	20, 20	23, 25	20, 20	25, 25	0
4	30, 33	25, 27	25, 27	25, 25	6
5	20, 20	20, 18	20, 20	20, 22	1
6	25, 25	22, 25	25, 20	25, 25	3
7	25, 25	25, 25	25, 25	25, 25	0
8	30, 27	25, 25	25, 25	25, 25	3
9	20, 20	10, 15	10, 10	10, 15	10

(c) As a control, observations were made in nine patients before and after the ordinary ward breakfast (fat content 12-30 g.). The results (Table V) show that, with the possible exception of Case 4, a significant reduction occurred in only one case (No. 9). In Cases 1-8 no macroscopic lipaemia was observed at 3, 3½, and 4 hours after the meal; in Case 9 macroscopic lipaemia was present at these times and was absent in the fasting sample.

Comment.—The results in Tables III, IV, and V show that the coagulability of blood as measured by this technique increases markedly after a high-fat intake if this produces macroscopic lipaemia. Conversely, meals low in fat have no influence on the clotting time unless macroscopic lipaemia develops. These results would seem to have greater significance than those given in section 1, since they demonstrate that clotting induced by naturally occurring thromboplastin is accelerated by lipaemia. Whether this effect is due to an increase of the essential lipid factor or to an alteration in the physical state of the plasma dependent upon its high content of chylomicrons during lipaemia has not been determined, and in any event the distinction does not influence the significance of the findings. We have discovered only one reference to observations similar to those described above. Duncan and Waldron (1949), using collodion-lined tubes, demonstrated a shortening of the clotting time in dogs and in humans, after the ingestion of cream. The implications of the results were not discussed.

Discussion

Lipaemia and Thrombosis

The results of these experiments seem striking enough to justify speculation regarding the pathogenesis of thrombosis, both arterial and venous.

Lipaemia is common in diabetes mellitus (Bloor, 1921; Joslin, 1927), pregnancy (Boyd, 1934), leukaemia (Pernokis

and Freeland, 1941), and after ether anaesthesia (Boyd, 1936) and acute blood loss (Boyd, 1934; Horiuchi, 1920). In all these circumstances thrombosis is frequent, although, of course, additional factors must be borne in mind; for example, the arterial degeneration in diabetes, venous stasis produced by the gravid uterus in pregnancy, the increased viscosity of blood in leukaemia, and immobilization after anaesthesia and blood loss. Nevertheless it seems possible, in view of the results described above, that the increased coagulability produced by lipaemia may be a factor responsible for the frequency of thrombosis in the conditions mentioned. It is known that coronary thrombosis not infrequently follows ingestion of a large meal (Master *et al.*, 1940; Smith *et al.*, 1942; Boas, 1942). It is impossible, however, on the evidence available, to determine whether this association is due to the decrease in coronary blood flow accompanying gastric distension (Gilbert *et al.*, 1940) or to the increased coagulability of blood which we have shown follows the ingestion of meals rich in fat.

Perhaps stronger evidence in favour of our thesis is given by the numerous observations which relate thrombosis to the dietary intake of fat. For example, Dock (1946) has noted that diets rich in eggs, cream, and butter are particularly common in men who are neither diabetic nor hypertensive, but who develop myocardial infarction. Malmros (1949) also considers that excessive consumption of eggs, butter, and other foods rich in fat may be the cause of the large numbers of cases of myocardial infarction now being observed. He points out that in Denmark the consumption of fat has been high for a long time and did not decrease in the second world war, whereas in Norway the consumption of fat and eggs was very low during the war. He thinks that this may explain why there was a fall in the incidence of myocardial infarction in Norway but not in Denmark during that period. Closs and Dedichen (1949) showed a similar fluctuation in the incidence of thrombo-embolic disease in general during the war in Norway.

Lipaemia and Atherosclerosis

Although the pathogenesis of atherosclerosis remains obscure despite intensive investigations for many years, some recent work has tended to discount the view of Virchow that the essential lesion is a primary degeneration in the arterial wall and has lent support to the earlier work of Rokitsky. This point of view has been emphasized in recent years by Duguid (1949, 1952), who holds that the lesion in atherosclerosis does not arise initially within the arterial wall but follows the incorporation into the vessel wall of fibrin deposits which are covered by vascular endothelium and later show hyaline and fatty change. If this conception be correct then it follows that any factor which leads to intravascular fibrin formation may be of importance in the pathogenesis of atherosclerosis. The results of our experimental work have led us to consider whether alimentary lipaemia may be a factor of importance in this process.

A large volume of work indicates that the level of the serum cholesterol probably bears some significant relationship to the development of atherosclerosis (Boas *et al.*, 1948; Gubner and Ungerleider, 1949; Duff and McMillan, 1951; Gould, 1951; Keys, 1951a, 1951b; and Katz, 1952). Numerous investigations on these lines have been carried out since Anitschkow (1933) showed that arterial lesions similar to atheroma followed cholesterol feeding in rabbits. As Keys *et al.* (1952) have pointed out, this finding cannot be applied directly to the problem of atherosclerosis in humans, since the amount of cholesterol needed to produce the lesions in rabbits is fantastically high in comparison with the cholesterol content of the diet in man. He concludes that "from the animal experiments alone the most reasonable conclusion would be that the cholesterol content of human diets is unimportant in human atherosclerosis." In any event, it is now clear that in man there is no relationship between the serum cholesterol level and the habitual dietary intake of cholesterol (Keys, 1949; Keys *et al.*, 1950;

and Gertler *et al.*, 1950) but marked changes in the cholesterol level occur when the intake of fat is altered (Keys *et al.*, 1950; Hildreth *et al.*, 1951; and Keys, 1952). It is thus apparent that the large amount of evidence which links high serum cholesterol levels with the development of atherosclerosis may simply mean that a high-fat intake is related to atherosclerosis, and it is our suggestion that the high-fat intake acts by inducing increased coagulability of blood during phases of lipaemia.

Any theory of the pathogenesis of thrombosis and atherosclerosis must account for the notable variation in the age of onset and also for the tendency for the lesions to increase with age. Therefore it would be necessary, if our theory is to withstand criticism, to adduce evidence that the degree of lipaemia following ingestion of fat shows considerable individual variation and that in general it tends to be greater in the elderly than in the young. It is not difficult to find experimental work which supports both these suggestions (Neches *et al.*, 1949; Morrison *et al.*, 1949; and Moreton, 1950). In our own studies we have noted great variation from case to case in the macroscopic degree of lipaemia following the standard high-fat breakfast, and Morrison and his co-workers (1949) devised a fat-tolerance test which showed that the rise in the serum lipid constituents following a high-fat meal varied within wide limits and was particularly high in 25 patients with recent coronary thrombosis. Neches *et al.* (1949), by a study of the chylomicron counts after the ingestion of fat, found that this measure of lipaemia was altered much more in elderly individuals than in the young.

We suggest, therefore, that the pathogenesis of atherosclerosis may not be so obscure as it has appeared in the past. The conception that lipaemia, by leading to increased coagulability, produces fibrin deposits which are incorporated into the arterial wall accords well with our experimental findings and with a large amount of circumstantial evidence relating atherosclerosis to fat intake and serum cholesterol levels. It does not of course explain the apparent increase of atherosclerosis in the coronary arterial tree, but it is important not to let this particular aspect overshadow the general problem. We know of no convincing evidence that the overall incidence of atherosclerosis is increasing to a greater extent than can be accounted for by the general increase in longevity; the cause of its frequent and early localization in the coronary arteries may well be a problem separate from that of atherosclerosis in general.

It should be pointed out that our findings suggest that it is the occasional high intake of fat that is likely to be important rather than the average daily intake, since we found that the normal ward breakfast was followed by an increase in coagulability in only one case. If further work supports the theory set out above, studies of fat tolerance will become of increasing importance. In this way it might be possible to use the information thus obtained to determine which individuals are likely to develop atherosclerosis if a high dietary intake of fat is continued.

Summary

Alimentary lipaemia increases the coagulability of blood as measured by the "accelerated clotting time" and the clotting time in silicone-coated tubes.

The possible relationship of this finding to the pathogenesis of thrombosis and atherosclerosis is discussed.

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ASSOCIATION BETWEEN PERIOD OF GESTATION AND LENGTH OF MENSTRUAL CYCLE

BY

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It has often been stated that the period of gestation may be a multiple of the length of the menstrual cycle. This possibility is suggested by evidence, in experimental animals and in man, of cyclic activity in the ovary during pregnancy, and by a supposed association between the length of the cycle and the duration of pregnancy. The association can by no means be said to be established in man, the lack of good data being due largely to the difficulty of establishing the length of the menstrual cycle. In the course of an inquiry in which pregnant women were investigated from the first antenatal attendance until two years after the birth of the

child, we have recorded both the period of amenorrhoea and the length of the cycle for 1,227 mothers of single births, and the data are here used in an examination of the association between the two variables.

(a) *Period of Gestation*.—Our only indication of the period of gestation is the duration of amenorrhoea. The date of onset of the last menstrual period was recorded at the first antenatal attendance,* and the date of birth was extracted from the records of notification of birth submitted to the public health department.

(b) *Length of Menstrual Cycle*.—Either on leaving hospital or at the first home visit of a health visitor, mothers were given a calendar on which they were asked to cross off each day of bleeding during the year after the birth of the child. This calendar was printed on a child's record card, on which were entered other items of more interest to the mother (such as the weight of the child). Mothers were subsequently interviewed at a welfare centre or at home within two weeks of each quarter during the year following birth, at which time the record card was inspected and the menstrual history copied on to another document. These documents provided the data used in the analysis which follows.

As a means of excluding some pregnancies of abnormal length, the examination is restricted to the 1,227 mothers of single births whose children survived to the end of the first year. (For example, this device excludes several pregnancies whose duration is influenced by the presence of a malformed foetus.) For 362 of the 1,227 mothers the data were considered incomplete, either because the period of amenorrhoea was not reliable or because fewer than three menstrual cycles were recorded in the year after birth.

Of the 865 cases in which the data were thought to be complete enough, 149 were excluded because the menstrual history was irregular. It is not possible to give any precise indication of what constituted an irregular history, except to say that two observers inspected the data independently, and with few exceptions decided upon exclusion of the same cases.

Table I shows the association between the length of the cycle and the period of amenorrhoea for the 716 women who had at least three regular cycles, and for whom the period of amenorrhoea was recorded unequivocally. The shortest mean length of cycle was 23 days (six women) and the longest 45 days (one woman).

The data suggest that the period of amenorrhoea increases slightly with the length of the cycle. The association is, however, somewhat irregular. This irregularity is attributable largely to the fact that the mean length of cycle for each woman has been calculated from all cycles during the year. Inspection of the records indicates that many women whose menstrual cycles are in general quite regular have one or two cycles which are grossly inconsistent with the others, and whose inclusion must make the mean less

TABLE I.—Period of Amenorrhoea Related to Length of Cycle. Length of Cycle is Given as a Crude Mean

Mean Length of Cycle (Days):	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Over 38	Total
Mean period of amenorrhoea (days)	271.5	271.0	280.0	277.5	278.9	278.1	280.8	281.7	285.4	280.7	279.3	285.2	286.0	283.0	281.8	290.1	—	280.9
No. of women	6	6	24	51	76	113	126	111	65	51	34	18	12	6	8	7	2	716

child, we have recorded both the period of amenorrhoea and the length of the cycle for 1,227 mothers of single births, and the data are here used in an examination of the association between the two variables.

Period of Amenorrhoea Related to Length of Cycle

We have attempted to collect fairly extensive data in respect of pregnancies of all mothers domiciled in the County Borough of Smethwick whose children were born

accurate. We have therefore recalculated the mean length of cycle for each of the 716 women, after excluding cycles whose lengths were judged to be inconsistent with the other observations. Table II gives the number of recorded cycles upon which the adjusted means are based: thus for 37 women the mean is based on three cycles, and for 34 on four.

*70% of the mothers were supervised during the antenatal period by one of us (T. D.).

TABLE II.—Number of Cycles upon which Adjusted Mean Length of Cycle is Based

No. of Cycles	No. of Women	No. of Cycles	No. of Women
3	37	8	105
4	34	9	137
5	56	10	129
6	70	11	60
7	88		716

In Table III the adjusted means are used to relate the period of amenorrhoea to the length of the cycle. The chart shows a straight line* fitted to the observations, and the means have also been plotted. The data indicate that the period of amenorrhoea increases by about a day for each additional day on the length of the cycle.

TABLE III.—Period of Amenorrhoea Related to Length of Cycle. Length of Cycle is Given as an Adjusted† Mean

Period of Amenorrhoea (Days)	Mean Length of Cycle (Days)																Total
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	
238-244	—	—	—	1	—	3	1	1	—	—	—	—	—	—	—	—	6
245-251	—	—	—	2	1	1	1	2	—	—	—	—	—	—	—	—	10
252-258	1	—	1	3	3	4	1	1	2	—	—	—	—	—	—	—	18
259-265	—	1	3	3	6	6	5	1	1	—	—	—	—	—	—	—	29
266-272	1	2	2	11	9	18	13	10	4	2	—	—	—	—	—	—	78
273-279	2	2	7	15	15	26	32	24	8	7	3	5	3	—	—	—	143
280-286	1	2	7	15	29	43	38	21	20	9	—	4	3	—	—	—	192
287-293	1	—	4	13	15	21	27	27	24	13	7	5	2	1	1	2	166
294-300	—	—	1	4	8	7	7	11	5	4	2	5	—	—	—	—	53
301-307	—	—	—	1	—	2	2	2	3	1	—	—	—	—	—	—	11
308-314	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	5
Total	6	7	27	62	86	132	127	100	71	42	16	20	13	1	2	4	716
Mean‡	274.8	274.0	276.0	278.0	279.9	279.1	280.7	282.2	286.1	281.8	281.7	285.8	285.1	—	—	—	280.9
Error of mean	4.49	2.72	2.32	1.68	1.21	1.04	0.88	1.13	1.33	1.87	3.09	1.94	2.33	—	—	—	0.43

† See text for method of adjustment. ‡ Means have been calculated from the ungrouped data.

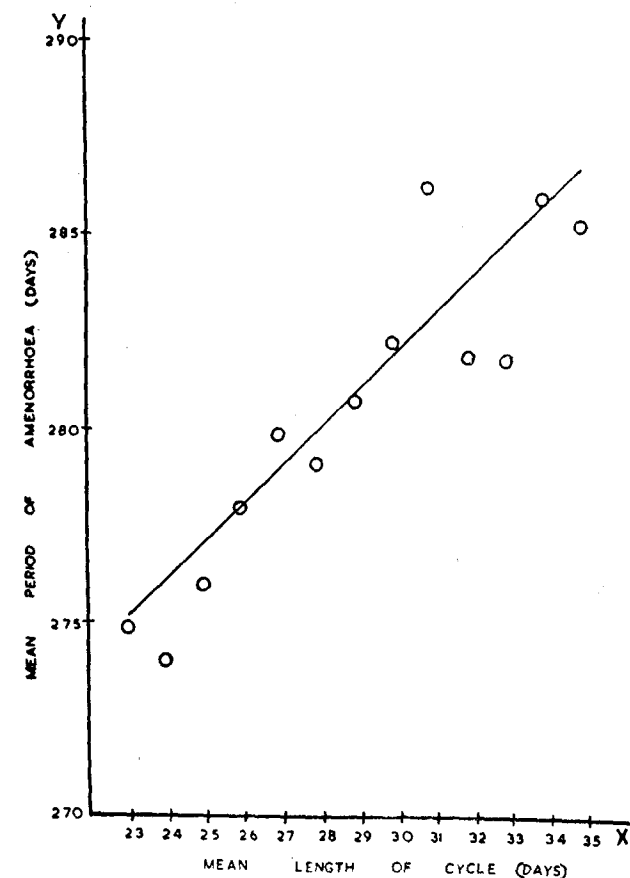


Chart showing mean period of amenorrhoea related to mean length of cycle.

*The regression of mean period of amenorrhoea on mean length of cycle was estimated by the method of least squares from the data given in Table III. The equation of the fitted line is $y = 253.39 + 0.95x$.

Before accepting these results we should consider the possible objection that a menstrual history recorded in the year after the birth of a child may not be typical. It is difficult to know what could be regarded as a typical menstrual history of parous women. We have, however, excluded grossly abnormal cycles, as indicated above, and we have satisfied ourselves that the results are not substantially affected by variation associated with birth order or maternal age.

Discussion

The possibility that the period of gestation may be a multiple of the length of the menstrual or oestrous cycle, and that the time of onset of labour coincides with an estimated time of reappearance of the cycle, is suggested by three kinds of evidence.

1. It is well established that all cyclic activity of the ovary does not cease during pregnancy. As a rule this activity consists in ripening of fresh follicles without ovulation, a phenomenon observed in several species by Loeb (1923) and Evans and Swezy (1931). But occasionally overt manifestations of cyclic activity have been noted; for example, by Nelson (1929) in the rat, and by Tinklepaugh (1933) and Elder and Yerkes (1936) in the chimpanzee. Hartman (1932) referred to two reports (by Saint Hilaire and Cuvier, and by Allesch and Fox) of menstrual bleeding throughout pregnancy in women, and Wintz (1925) described two interesting cases of periodic bleeding from the empty horn of a bicornuate uterus.

2. The fact that in a few species the mean duration of gestation is approximately a multiple of the mean length of cycle has been considered significant (Shaw, 1926; Snyder, 1938). In animals such as the rat and mouse the association is scarcely surprising, since the duration of pregnancy (20-21 days) would be a multiple of any cycle of less than six days. But in man the observation that the mean period of amenorrhoea (280 days) is ten times the mean length of the menstrual cycle (28 days) is more suggestive.

3. In man, the length of the cycle and the duration of gestation are said to be correlated. Jolly (1928) recorded histories of five women with regular 24-day cycles whose pregnancies were 265 days, when estimated from the middle day of the last menstruation to birth, and corresponded roughly to 11 cycles. Results on women with longer cycles were inconsistent. More extensive data published by Wahl (1936, 1937) undoubtedly suggest that the duration of gestation increases with the length of the cycle, although the increments are too small to be consistent with the view that the one is a multiple of the other.

In the present communication it is shown that among women with regular cycles the mean duration of amenorrhoea (from onset of menstruation to birth) increases by about a day for each additional day in the mean length of the menstrual cycle. This also suggests that the period of gestation is not a multiple of the length of the cycle. A more plausible explanation of the association between the two variables is as follows.

There is good reason to believe that the length of the post-ovulatory phase is fairly constant, being about 14 days, and that variation in the length of the cycle is due mainly to variation in the pre-ovulatory phase (Zuckerman, 1937; Latz and Reiner, 1942; Corner, Hartman, and Bartelmez, 1945; Rock and Hertig, 1948; and Krohn, 1949). The period of amenorrhoea might therefore be expected to increase by one day for each additional day in the length of the cycle, even if the time between ovulation and birth were constant. In Table IV the period between ovulation and birth has been estimated by subtracting the interval between

TABLE IV.—Period Between Ovulation and Birth Related to Length of Cycle

Mean Length of Cycle (Days)	Period of Amenorrhoea (Days)	Assumed Interval between Onset of Menstruation and Ovulation (Days)	Estimated Period between Ovulation and Birth (Days)
23	274.8	9	265.8
24	274.0	10	264.0
25	276.0	11	265.0
26	278.0	12	266.0
27	279.9	13	266.9
28	279.1	14	265.1
29	280.7	15	265.7
30	282.2	16	266.2
31	286.1	17	269.1
32	281.8	18	263.8
33	281.7	19	262.7
34	285.8	20	265.8
35	285.1	21	264.1

the onset of menstruation and ovulation (assumed to be 14 days for women with 28-day cycles, and adjusted according to length of cycle) from the periods of amenorrhoea recorded in Table III. The estimated periods between ovulation and birth obtained in this way are all reasonably close to the mean of 266 days, based on 716 births.

It is concluded that variation in the period of amenorrhoea according to the length of the menstrual cycle is probably determined by variation in the interval between the onset of menstruation and ovulation. If this is so, the period between ovulation and birth seems to be independent of the length of the cycle.

It is perhaps necessary to stress that the observation that the period of amenorrhoea increases by about a day for each additional day in the length of the cycle is based on mean values derived from a large number of cases. The mean duration of gestation is of course associated with many other variables, and it seems unlikely that its association with the mean length of cycle can be used in individual cases to give an estimate of the expected date of delivery more accurate than the conventional one.

Summary

The association between the period of gestation and the length of the menstrual cycle has been investigated in 1,227 women whose menstrual history was recorded for one year after the birth of a child. The data were considered adequate for 716 women with regular cycles.

It is shown that the period of amenorrhoea (from the onset of menstruation to birth) increases by about a day for each additional day in the length of the cycle.

It is suggested that variation in the period of amenorrhoea according to the length of the menstrual cycle is determined by variation in the interval between the onset of menstruation and ovulation. If this is so, the period between ovulation and birth seems to be independent of the length of the cycle.

We are indebted to Dr. Hugh Paul and to the midwives and health visitors of the Public Health Department, Smethwick, for their assistance in this inquiry. The nursing staff of St. Chad's Hospital assisted in the completion of the antenatal and birth records.

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THE ACUTE HYPOXIC EPISODE*

BY

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"Anoxia not only stops the machine, but wrecks the machinery."—HALDANE.

A good deal has been written on the subject of hypoxia, and great stress has been laid upon its deleterious effects on certain systems and organs, and on the organism as a whole. All authors stress the importance of avoiding hypoxia and of promptly terminating it should it occur.

Courville (1939) has examined the pathological findings associated with acute hypoxia in nitrous oxide anaesthesia. Although it is more than 10 years old his classification of the pathological findings, based on the severity of the hypoxic episode and the length of survival time, retains as much of its value to-day as it did when it was first published.

Many conditions, both medical and surgical, may be accompanied by hypoxia, but the surgeon encounters it in its most dramatic form—that is, as acute cardiac failure, arrest, or standstill. It is generally recognized that in these cases the immediate concern is to re-establish efficient pulmonary ventilation by artificial respiration combined with oxygen, and to restore the circulation to the vital centres by manual systole. Efficient manual systole must be accomplished within four minutes from the time that heart action has ceased, and more quickly if possible. If chronic hypoxia has preceded the acute episode, then the period within which circulation to the vital centres must be restored may be very much shorter than four minutes. There are many cases on record in which recovery has followed cardiac arrest lasting longer than four minutes, but as the minutes pass the chances of full, and later of partial,

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recovery become progressively less. Once the circulation has been restored, the various manœuvres designed to induce spontaneous resumption of cardiac activity may be carried out in a deliberate and somewhat more leisurely way; or else they may not be needed at all, as not infrequently the heart will resume beating under the stimulus of manual systole alone.

Although literature on hypoxia is extensive, there are only scattered and inadequate references to the treatment of the post-hypoxic state. It is generally assumed that irreversible damage to the vital structures, and particularly to the brain and brain stem, occurs at the instant of the hypoxic episode and that treatment is futile on account of the irreversibility of the damage. We believe, and we hope to show in the following discussion, that the passive "wait-and-see" attitude which has hitherto prevailed is not justified, and that active treatment is not only possible but is vitally necessary if we are to save a number of those who in the past would have succumbed. We agree that any destruction of nervous elements at the time of the hypoxic incident is irreversible, but suggest that in many cases such total destruction is only of minor extent and that there are large areas of reversibly damaged tissue which is capable of recovery under suitable management. We believe that much of the fatal hypoxia and extensive cerebral damage occurs in the post-hypoxic period, and can thus be prevented.

The Role of Cerebral Oedema

One of the sequelae of acute hypoxia is the appearance of cerebral oedema. This is only to be expected, as oedema will appear anywhere in the body where oxygen want has interfered with the integrity of the capillary membrane. This oedema interposes a physical barrier between the oxygen-supplying blood capillaries and the cells. In the brain the oedema, affecting as it does a structure enclosed in a rigid bony case, has the further damaging effect of raising intracranial pressure and of thus interfering mechanically with cerebral circulation. Thus the initial hypoxia becomes potentiated, and with it the hypoxic damage mounts, completing a vicious circle of great detriment to the chances of the subject's recovery. It is of little avail at this stage that the original hypoxic episode has been controlled. The vicious cycle will continue even after, say, the heart has been restarted after cardiac arrest and efficient circulation has been re-established. It is necessary to break the vicious cycle—that is, to treat the existing or developing cerebral oedema. We believe that even the pre-terminal hyperpyrexia which is often seen in these cases may in at least some of them be explained on the basis of oedema involving the heat-regulating area. Therefore this sign need not be taken as necessarily pre-terminal, although it often precedes death. We take it to mean only that extensive damage is present which is extending into the hypothalamus.

Dehydration Therapy

With these considerations in mind, we have of late subjected patients who have had an acute hypoxic episode to a regimen of vigorous dehydration. The following case history is presented as an example of the method of treatment, and also because of the extreme severity of the hypoxia, which yet was followed by a quite unexpected return to apparent clinical normality.

A well-nourished man of 43 was to undergo thoracotomy for carcinoma of the left lung. His general condition before operation was good, and apart from his present illness there was no other major disorder. Bronchial obstruction due to the growth made it impossible to collapse the affected lung during operation, and after some manipulations cyanosis began to appear, and continued to increase in intensity. The cyanosis was not relieved by repeated tracheo-bronchial toilet, and only momentary improvement followed whenever a moderate amount of blood and

secretions was aspirated from the dependent lung. The lesion was found to be inoperable and the chest was closed; this was completed two hours and thirty-five minutes after induction. After closure the patient reacted, opened his eyes, but still his colour remained dusky as before. Bronchoscopy was done and much material was aspirated; while this procedure was still in progress cardiac arrest occurred.

The chest was immediately reopened and an asystolic flabby heart was found. Manual systole restored circulation to the extent that a carotid pulse could be felt; soon the heart resumed spontaneous action. An estimated four minutes had elapsed from the time the diagnosis of cardiac arrest had been made to the establishment of manual systole. Oxygen administration through an endotracheal tube had been carried out from the instant the heart had been known to have stopped. After efficient heart action had been observed for some 10 minutes, the chest was closed. The patient was breathing spontaneously and oxygen administration was continued, but he remained in deep coma with widely dilated pupils and all reflexes absent. The colour was improved but by no means satisfactory.

At this stage, half an hour after successful restoration of circulation, 50 ml. of 50% glucose was injected intravenously, and within one minute signs of lightening of the coma were observed, such as roving eyeballs and involuntary incoordinated movements of the extremities. This improvement persisted for a little over half an hour, when coma again deepened without, however, reaching the depth that had obtained prior to the glucose medication. Some four hours later the temperature began to rise rapidly, and the injection of glucose was repeated. This time the patient made attempts at sitting up and even of getting out of bed, but he was still unconscious. Later the coma again deepened, but the level did not reach to where it had been before the second injection. The temperature began to fall and during the night a slow intravenous drip of 1,000 ml. of 25% glucose was given. He remained in light coma during the following day, but regained consciousness on the third post-operative day, and thereafter made an uneventful although slow recovery. He had no residual neurological symptoms and presented no evidence of kidney damage from the hypertonic solution when he was discharged from hospital 10 days later.

This was a case in which total hypoxia of at least four minutes, superimposed as it was upon prolonged severe hypoxia, made it likely that the patient would succumb; yet after vigorous dehydration therapy he recovered with no apparent residual damage. This would indicate that the nervous elements destroyed beyond recovery by the original hypoxia must have been relatively few. It was striking how after each administration of hypertonic glucose the coma markedly lightened and never quite returned to its previous depth, and how by the same measure it was possible to check hyperpyrexia. That the result was not permanent after each administration is not surprising, as we know that oedema recurs after the drug has ceased its dehydrating action. This has been sometimes called "rebound oedema." The improvement observed was not due to the glucose itself, as it has been shown that glucose is ineffective in increasing cortical survival time, at least in rabbits exposed to hypoxia (Noell and Chinn, 1950); nor does it increase resistance to hypoxia in dogs (Snapp, Adler, and Kramer, 1948). The same has incidentally been shown also in rabbits for glutamate, pyruvate, succinate, and fumarate (Noell and Chinn, 1950).

It would appear that concentrated human serum albumin, which has been recommended as a substitute for hypertonic glucose in the control of oedema (Cole, 1951), is also useful in these cases, and it has been employed by one of us in a recent case. Another substance which is worth trying, especially because of its universal availability, is double or quadruple concentrated plasma. This may be obtained by reconstituting dried plasma with half or one-quarter the quantity of water usually employed. On theoretical grounds plasma expanders, such as dextran and polyvinylpyrrolidone would also seem to be indicated, but there is as yet not enough information to allow of their evaluation as dehydration agents. Serum or plasma has proved as effective as hypertonic glucose and may actually be preferable, as the latter, if administered for any length of time, may lead to renal damage. However, this should not be a deterrent to its use in the absence of a more suitable agent, for the con-

dition of the patient is desperate. It may be advantageous to give a diuretic agent at the same time as the hypertonic solutions, in order to maintain kidney function during this critical period. Efficient kidney function is probably a very important factor in the control of the oedema. Recurrence of oedema will be prevented largely by a rigid control of fluid and electrolyte administration, but the effectiveness of such control depends much upon adequate renal function.

Adequate Oxygenation

Oxygen is administered continuously throughout the post-hypoxic period, and a mask or nasopharyngeal catheter is preferred to a tent on account of its greater efficiency. A scrupulously clear air-way is maintained at all times and secretions are often aspirated through an endotracheal tube. A slight head-down tilt of the bed at approximately 7 degrees assists the drainage of secretions without interfering unduly with cardio-respiratory function or causing congestion of the head. There should be no hesitation to perform a tracheotomy in order to ensure an unobstructed air-way or to facilitate the removal of secretions. Tracheotomy is also advisable if coma is prolonged, as it is unwise to keep an endotracheal tube in position for longer than 24 to 36 hours.

While a clear air-way is of the first importance, the adequacy of tidal exchange must not be overlooked. These patients may remain in a state of chronic hypoxia if adequate ventilation is not ensured. If necessary they can be placed in a Drinker respirator or a similar device. We recently observed a case in which post-operative hypoxia occurred when the patient was returned to her bed. Ten hours later she was still unconscious with only leg reflexes remaining; under a regimen of endotracheal tube, Drinker respirator, and concentrated albumin, she revived sufficiently in three hours to respond to instructions. Anaesthetic drugs have no place in the treatment of the post-hypoxic respiratory depression, having been shown in rabbits to be actually harmful (Noell, 1948).

Other Measures

Another problem in these cases which requires mention is that of gastric dilatation. This condition is combated by early passage of a stomach tube; the tube may be left *in situ* to ensure against recurrence of dilatation, and may later be used for feeding purposes if coma is prolonged.

Meanwhile general supportive measures are carried out vigorously. Nutrition of the patient must be ensured, and may be carried out via a stomach tube, as described; intravenous protein hydrolysates are administered if necessary. Vitamins of the B complex and vitamin C are of advantage. Blood is transfused, and in this one must be guided by the actual amount lost. Overtransfusion is very harmful in these cases, but so is any deficiency of the oxygen-carrying elements of the blood. The blood pressure must be maintained, and for this vasopressors are preferred to intravenous fluids over and above the minimum requirements, so as not to interfere with the dehydration regimen. For the same reason electrolytes, particularly sodium, are omitted from such solutions as must be given. It must always be borne in mind, however, that along with the brain the whole body is being dehydrated; this necessitates a careful watch on the patient's electrolyte balance during the period of this therapy. If the blood pressure proves difficult to maintain, vasopressors are administered. Schmidt (1950) has shown that intracranial vessels are relatively insensitive to all drugs that constrict blood vessels elsewhere, and hence any of the innumerable vasopressors available may be employed. We personally prefer noradrenaline in a continuous drip for a period of time, or, failing this, phenylephrine hydrochloride ("neosynephrine").

Antibiotics are administered, and the stir-up regimen is followed—this consisting in turning the patient frequently from one side to the other; and carbon dioxide inhalations for short periods may also be indicated. This not only

improves pulmonary ventilation but also has a potent cerebrovascular dilating effect. The important point to remember is that under no circumstances must these patients be left flat on their back for any length of time. As the coma lightens, they may become very restless. If this occurs the temptation to over-sedate must be resisted, else the central depression and consequently reduced tidal volume will precipitate further hypoxia.

In an attempt to increase cerebral circulation, stellate ganglion block has been recommended and is widely employed, but it is still controversial whether the smaller cerebral vessels possess muscular constricting elements, and no final agreement has been reached on their extrinsic innervation (Schmidt, 1950). However, we are not too much concerned with these small blood vessels, but rather with the larger stems and the named vessels. It may be argued that these too should already be in a state of maximum dilatation; but that they are capable of further dilatation when the stellate ganglion is blocked can be inferred by use of the flicker photometer, and that they actually do dilate under conditions of hypoxia after a stellate block can be observed directly on retinoscopy. In the absence of localizing signs, the ganglion to be blocked is the one opposite to the side of the patient's usual preponderance. If, however, no result is obtained we would not hesitate to carry out a bilateral block despite dangers which have been ascribed to this procedure. We have seen no ill effects from it. Various drugs have also been recommended and tried in order to improve cerebral circulation, but they appear to be of little value.

Conclusion

Our therapeutic resources against the effects of acute hypoxia are few. They must ensure adequate oxygenation of the vital tissues of the body and suppress cerebral oedema with its potentiating effect on the hypoxic damage to the central nervous system. We believe that a dehydration regimen combined with the administration of oxygen, maintenance of an adequate tidal exchange, and general supportive measures afford the best means of achieving these ends. However, even when this line of treatment is adopted, it is still quite impossible to prognosticate on the outcome in individual cases. We have seen patients who immediately after the acute hypoxic episode looked fairly well deteriorate rapidly within a matter of hours, probably owing to rapidly developing and poorly controlled cerebral oedema, while others even after many days of coma regain consciousness without showing residual damage. Hence, we must not abandon hope in even those cases which seem hopeless at the onset; once an acute hypoxic episode has taken place, the patient's chances of recovery depend largely on our acting quickly, thoroughly, and completely.

Summary

A line of treatment is presented to combat the sequelae of acute hypoxia. This is based on the assumption that much of the damage is due to cerebral oedema which supervenes after the acute hypoxia has been relieved. Vigorous dehydration, combined with the administration of oxygen, maintenance of adequate tidal exchange, and general supportive measures are the mainstay of treatment.

We wish to acknowledge with thanks the helpful and constructive suggestions received from Dr. Paul Bucy, professor of neurology and neurological surgery at the University of Illinois.

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PYRIMETHAMINE ("DARAPRIM") IN THE TREATMENT OF VIVAX MALARIA

BY

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At a meeting of the Royal Society of Tropical Medicine and Hygiene in July, 1952, it was suggested that pyrimethamine might prove of value in effecting a radical cure of vivax malaria by destroying the late exoerythrocytic forms of the parasite which are presumed to be responsible for relapse. The investigations here recorded were undertaken with the object of testing this theory.

The parasite used was the Madagascar strain of *Plasmodium vivax* which has been maintained at Horton for the routine treatment of neurosyphilis for the past 28 years. A peculiar characteristic of this strain of *P. vivax* is its tendency to give rise to attacks of fever with parasitaemia between the 30th and 40th weeks after mosquito infection. In most cases these attacks represent relapses following a primary attack which has begun 9 to 15 days after infection. In some instances the incidence of the primary attack itself may be delayed until this period.

The subjects of the trial were 12 patients, none of whom had a previous history of malaria. Each of them was subjected to the bites of 10 to 12 mosquitoes from an infected batch of *Anopheles atroparvus* on September 6, 1952. An overt malarial attack developed in each case after an incubation period of 9 to 11 days.

Each patient underwent a course of 50 mg. of pyrimethamine given as a single daily dose over a period of five days (total 250 mg.). Treatment was begun in all cases on the day when parasites were first found in the

peripheral blood. In two cases this was on the day before the first rise of temperature, but in the remainder it was on the first or second day of fever.

Result

In three of the subjects relapses (pyrexia with parasitaemia) occurred 55, 74, and 88 days after the last day of treatment (see Chart). Each relapse was treated, as in the primary attack, with a five-day course of 50 mg. of pyrimethamine daily. The patient who relapsed on the 74th day experienced a second relapse on the 14th day after completing his second five-day course. He was treated for this with a single dose of 50 mg. of pyrimethamine, but relapsed again 22 days later. A fourth subject relapsed on the 99th day. It was thus already clear that treatment of the primary attack with pyrimethamine in full dosage was not an effective method of preventing relapse of this strain of *P. vivax*.

It was now decided to test the effect of a weekly dose of 25 mg. of pyrimethamine given over a period of two months on the incidence of late relapses, which, as noted above, may be expected to occur with this strain of *P. vivax* between the 30th and 40th week after infection. Accordingly, on the 99th day after completion of the first course (the day on which the fourth patient (D) relapsed), the whole group, with the exception of the individual (A) who had already relapsed twice, received a single dose of 25 mg. of pyrimethamine, which was repeated at weekly intervals for the next seven weeks (eight doses in all).

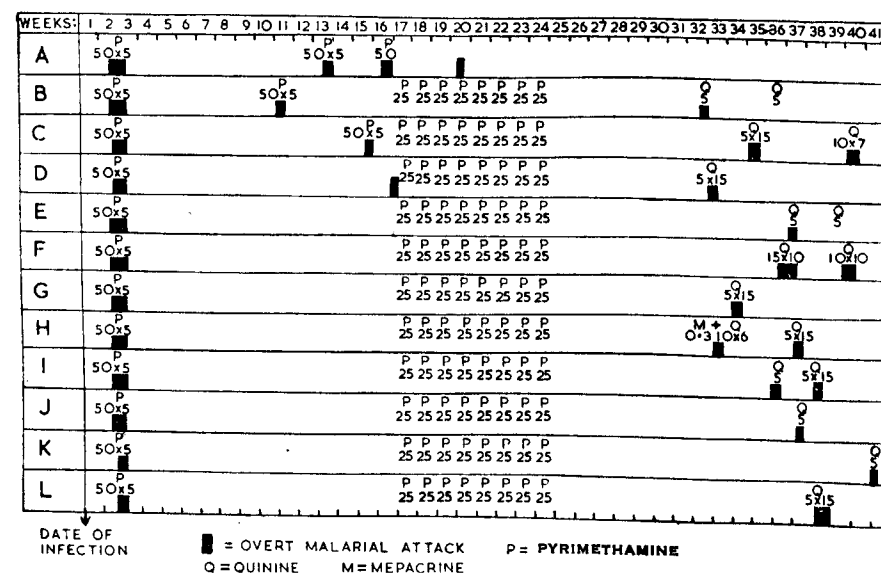
Fifty-nine days after the last weekly dose (32 weeks after the infecting feed) the patient (B) who had relapsed on the 55th day experienced a second relapse. Every other member of the group, without exception, relapsed on one or more occasions between the 32nd and 41st weeks after the infecting feed (see Chart). There was thus no indication that the eight-weeks course of pyrimethamine given from the 17th to the 24th weeks after infection had had any effect on the subsequent relapse rate.

The results afford a striking example of the very high rate of relapse which occurs with this strain of *P. vivax* following early treatment of the primary attack. In patients who are allowed to have a dozen or more peaks of fever with this strain of parasite before the primary attack is terminated (as in the routine treatment of neurosyphilis with malaria therapy) the relapse rate is in the region of 50% only.

Effect of Pyrimethamine on Clinical Attack.—As was to be expected from the experience of other observers, the clinical response to pyrimethamine in the primary attack was slow. Fever persisted for seven days in one case, for six days in three, for five days in five, for four days in two, and for three days in the remaining one. It is clear that pyrimethamine unaided is not a satisfactory drug for the treatment of vivax malaria in a non-immune subject.

Toxicity

One of the patients (F) developed pyrexia on the eighth day after completing the five-day course of 50 mg. of pyrimethamine given for treatment of the primary attack. Fever continued in an irregular fashion for eight days, but no parasites were found at any time in the peripheral blood despite repeated and intensive search of both thick and thin smears. Two days after the onset of fever there was epistaxis over a period of 12 hours. On the following day the red blood cell count was 4,000,000 per c.mm.



LEPROSY: REPORT ON FOUR CASES

BY

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Although a temporary increase in the incidence of leprosy in Great Britain was expected following the second world war (Ryrie, 1947), the disease remains relatively uncommon. Compulsory notification was introduced in September, 1951. In England and Wales 48 cases were notified in 1951 and 65 in 1952, but at least 100 of these were existing known cases. In Scotland seven cases had been reported up to the end of 1952.

During the past four years the four cases reported below were encountered in routine hospital practice in one city. It will be seen, however, that not all were due to the aftermath of global war, at least two being attributable to factors peculiar to a jute-manufacturing seaport. Even in this small series the diverse symptomatology and varying clinical types of the disease are well illustrated.

Case 1

The Goanese wife, aged 23, of a British Service man was first seen in May, 1948, with a circinate lesion of the right lower leg of 18 months' duration (Fig. 1). The margin of the lesion was raised and infiltrated, while the central flat area showed marked loss of sensation to light touch and pin-prick. No other skin lesion was present, nor could any thickened nerves be found. Biopsy of the active edge showed a tuberculoid histology; no acid-fast bacilli were demonstrated either here or in a nasal scrape. The lepromin test was positive.

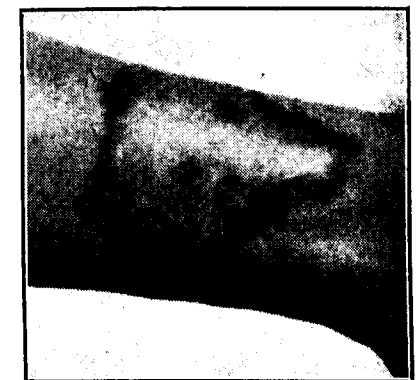


FIG. 1.—Case 1. Circinate lesion of leg before treatment with solapsone.

Twelve patients suffering from primary attacks of mosquito-induced vivax malaria (Madagascar strain) were treated with 50 mg. of pyrimethamine daily for five days. The clinical response to the action of the drug was slow, and for this reason alone we regard it as unsuitable for treatment of the clinical attack in non-immune subjects.

Four of the patients relapsed between the 55th and 99th days after completing the course, one of them on two occasions.

On the 99th day 11 of the group were given a single dose of 25 mg. of pyrimethamine, which was repeated at weekly intervals for the following seven weeks. All of them relapsed on one or more occasions between the 8th and 18th weeks after completing this eight-weeks course.

There is no indication that either of the two courses of pyrimethamine administered in this trial (50 mg. daily for five days during the primary attack and 25 mg. weekly for eight weeks, starting three and a half months later) were of any value in preventing the incidence of relapse, though it is possible that the attacks might have occurred somewhat earlier had the drug not been given.

We wish to express our thanks to Dr. J. H. Watkin, physician-superintendent, and to the staff of Horton Hospital for their co-operation in carrying out this investigation.

The British Standards Institution has issued a sectional list of British standards for hospital equipment. It catalogues standards for medical and surgical apparatus; laboratory glassware and scientific apparatus; furniture and fittings; textiles and clothing; photography and radiography; methods of testing; symbols, tables, and definitions; and electrical equipment. The list also includes a note on what new standards for hospital equipment are now being prepared. The list (P.D. 1644, dated June, 1953) is obtainable from the British Standards Institution (Sales Branch), 24, Victoria Street, London, S.W.1.

Treatment with weekly intradermal injections of "moo-grol" for two months produced no improvement. In December, 1948, solapsone by mouth was started. The maximum tolerated dose of three 0.5-g. tablets was taken intermittently over a long period. When last seen in May, 1951, the leg lesion had almost disappeared and sensation in the area showed considerable improvement.

Case 2

A British man aged 30, who had served in Cyprus, Syria, and India during the second world war, attended in August, 1948, with a generalized non-itchy eruption of brownish-red slightly infiltrated patches over the whole body surface. The Wassermann reaction was negative. A tentative diagnosis of sarcoidosis was not confirmed by biopsy, which showed an infiltrate of mononuclear cells and lymphocytes surrounding sweat ducts and follicles. In view of the possibility of a pre-mycotic eruption x rays and thorium X were applied to selected areas, without clinical benefit.

More lesions appeared, and in April, 1950, the face had become "leonine" (Fig. 2). The following neurological signs were then elicited: impairment of all forms of sensation over the larger plaques on the trunk, with palpable thickening of ulnar and lateral popliteal nerves on both sides. A thick palpable nerve was present on the medial

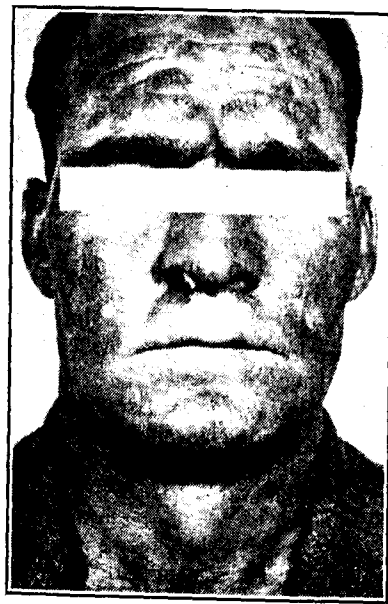


FIG. 2.—Case 2. Before treatment with thiosemicarbazone.

side of the right knee-joint. Biopsy of a nodule under the chin revealed numerous acid-fast bacilli in "globi" and scattered throughout the dermis. Bacilli were also found in a nasal scrape. The lepromin test was negative.

Treatment with thiosemicarbazone, 150 mg. daily, was started in May. Frequent blood examinations and liver-function tests revealed no deviation from normal and the patient had noted no side-effects. The skin lesions flattened gradually, and the leonine facies disappeared within one year. A nasal scrape was negative in March, 1952, and biopsy at that time revealed scanty and degenerated acid-fast bacilli in the skin. Treatment was continued with a dose of 100 mg. of thiosemicarbazone daily.

Case 3

A British man aged 65, who had retired after 30 years' service in India, was first seen in February, 1950, complaining of numbness and wasting of the right hand for four years, followed a year later by numbness of the left forefinger and of both feet.

Examination revealed scattered areas of depigmentation of the skin on the arms and legs. Weakness of both grips, the right more than the left, was present. There was wasting of the small muscles of the right hand, particularly the three ulnar interossei and the hypothenar muscles, and slight wasting of the left hypothenar muscles. Trophic sores and healed blisters were present on both hands, particularly on the right. The deep reflexes were normal in the arms; the right knee-jerk was diminished, the left normal; both ankle-jerks were absent. The plantar responses were flexor; the abdominal reflexes were present. Scattered areas of sensory loss to light touch, pin-prick, and temperature were present on the arms and legs. Position, vibration, and pain senses were normal. Some thickening of the ulnar nerves behind the medial condyles of the humeri was noted.

Biopsy of the edge of a depigmented area on the leg showed histological changes compatible with a diagnosis of leprosy, but no acid-fast bacilli could be demonstrated. The diagnosis of leprosy was confirmed by Dr. Ryrie. On his recommendation diaminodiphenyl sulphone (D.D.S.) was started in February with an initial dose of 100 mg. daily, later increased to 300 mg. daily. Only slight improvement was noted during treatment with this drug. The grips became stronger but the sensory loss was not appreciably lessened. After six weeks' treatment the drug had to be stopped for 10 days on account of malaise accompanied by slight cyanosis and an increase in urinary urobilinogen. In March, 1951, after 12 months' treatment, the condition had become static. Thiosemicarbazone was then substituted after a rest period of two weeks. The initial dose of

100 mg. daily was quickly increased to 150 mg. daily and this latter dose was maintained for 12 months without toxic effects. The disease seemed to be arrested, though no dramatic change in the condition had occurred.

Case 4

An Indian aged 30, temporarily resident in the city, was first seen in January, 1953, complaining of numbness and tingling of both feet. There was a history of treatment for leprosy in India until August, 1952.

Examination revealed no skin lesion, but a thickened nerve was palpable on the dorsum of the right foot and a similar thickened nerve was found below the right knee. The ulnar nerves also appeared thicker than normal. Areas of partial anaesthesia were found above both wrists; while in the feet hyperaesthesia of the proximal two-thirds was associated with diminished sensation over the distal thirds. A nasal scrape revealed numerous acid-fast bacilli, mainly packed in macrophage cells. Treatment with oral solapsone was started.

Comment

All four patients had contracted the disease in areas where leprosy is endemic. Cases 1 and 2 are connected with the movement of Service men during the war, but Cases 3 and 4 stem from the interchange of personnel between a jute-manufacturing Scottish town and the jute-producing areas of India and Pakistan.

Case 1 illustrates the tuberculoid type of the disease, while Cases 2 and 4 are undoubtedly lepromatous. Case 3 apparently belongs to the uncharacteristic type which cannot be placed in either polar group (Muir, 1948).

Little inference can be drawn from the results of treatment. It is doubtful if the intermittent and inadequate treatment with solapsone by mouth had any influence on the tuberculoid case. In the uncharacteristic case, in which irreversible tissue changes have occurred, therapy could not be expected to show any positive response but the symptoms and signs have certainly not progressed. The response of Case 2 to thiosemicarbazone has been good, and the gratifying absence of toxic side-effects supports Ryrie's (1950) views on the use of this drug. Nevertheless, many years must elapse before the question of "cure" by this or any other chemotherapeutic method can be assessed (Cochrane, 1952).

Summary

Four cases of leprosy occurring in hospital practice in one British city during the past four years are reported. The relatively high incidence is explained by local factors in addition to the expected post-war increase. Results of treatment to date are recorded.

We are indebted to Dr. John Kinnear and to Professor I. G. W. Hill for permission to publish these cases. We gratefully acknowledge the expert assistance of the late Dr. G. A. Ryrie and of Dr. R. G. Cochrane, of the British Empire Leprosy Relief Association.

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The Foot Health Educational Bureau has been incorporated in the Central Council for Health Education. The Bureau was founded in 1941 to stimulate public interest in the care of the feet, to effect liaison between the leather and shoe trade on the one hand and the medical profession on the other, to advocate good standards of shoe manufacture and fittings, and to influence the public towards the purchase of the right shoe for the job. It has run conferences and "Foot Health Weeks," and published many booklets and pamphlets. Its advisory services are used by local authorities, hospitals, schools, and the trade.

CASE OF LEPROSY SEEN IN A VENEREAL DISEASE CLINIC IN BRITAIN

BY

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Cases of leprosy are infrequently seen in venereal disease clinics in Great Britain. In view of this the following case is interesting enough to merit publication.

Case Report

A married British metal-worker aged 36 attended the medical out-patients department on May 12, 1951, with a history that he had been perfectly well until a month previously, when swelling of the ankles, arms, and hands developed. This was accompanied by a nodular rash on the face, back of the hands, forearms, and dorsal aspects of the feet. He was feeling perfectly well. He was admitted for investigation, and a tentative diagnosis of sarcoidosis was made.

A biopsy report on one of the nodules on the dorsal aspect of the left forearm was very suggestive of sarcoid, but a second biopsy was asked for. Unfortunately at this time he had discharged himself from hospital as he felt so very well. An x-ray film of the chest and finger-joints did not confirm the diagnosis.

In September, 1951, he developed a profuse nasal discharge which was occasionally blood-stained, especially first thing in the morning. This was treated by his own doctor with little success. In April, 1952, he was referred to the oto-rhino-laryngologist, Mr. Petty, who suggested that a Wassermann test be taken; this was found to be positive. The patient was then referred to the Infirmary.

On examination on May 2 a discrete symptomless nodular eruption was present on the face, back of the hands, extensor surface of the forearms, and dorsal aspects of the feet. The nodules measured about $\frac{1}{4}$ by $\frac{1}{4}$ in. (0.3 by 0.3 cm.). A non-irritating squamous erythematous rash was present over the anterior surface of both tibiae. The lesions had remained unchanged during the past twelve months.

The information was elicited that from 1938 to 1943 the patient had served abroad whilst in the armed Forces and had returned to England in the latter year. He had not been out of England since. Whilst abroad he served in India, Iraq, Palestine, Abyssinia, South Africa, and the Libyan Desert, and some of the regiments in which he served had coloured personnel. There was no history of venereal infection or any convincing clinical evidence of venereal disease. Nothing abnormal physically was elicited in the cardiovascular or central nervous system. Blood Wassermann and Kahn tests at this time were negative. Cerebrospinal fluid examination was within normal limits. His wife's Wassermann and Kahn reactions were negative.

A specimen of the patient's blood was forwarded to the Venereal Disease Reference Laboratory, St. Peter's Hospital, Whitechapel, on May 9. The routine Wassermann test was positive, serum diluted 1 in 128; cardiolipin Wassermann reaction positive; routine Kahn test positive; and Price's precipitation reaction negative. Dr. Orpwood Price reported: "In the absence of any history of syphilis, I should like to test another specimen from this patient before expressing an opinion."

On May 23 a routine Wassermann test was positive, serum diluted 1 in 32; a routine Kahn test negative, and Price's precipitation reaction negative. Dr. Orpwood Price reported: "The general pattern of this patient's serology and the history appears to favour the opinion that the positive reactions are non-syphilitic in nature. I therefore suggest that

he be tested at monthly intervals in order to find out the general pattern of his serological reactions." At this stage a tropical non-venereal disease was regarded as a likely cause of the serological reactions.

Further specimens of blood were tested on June 27 and July 17; the reactions of the former were anti-complementary, and the latter sample was reported on as follows: "Routine Wassermann reaction positive, serum diluted 1 in 64; cardiolipin Wassermann reaction positive; routine Kahn reaction negative; Price's precipitation reaction negative."

On July 4 a biopsy of one of the nodules on the right cheek showed a histological picture closely resembling sarcoid. On July 31 a biopsy of one of the nodules on the forehead showed a similar histological picture to the previous sections.

Cutaneous leishmaniasis and sporotrichosis were ruled out.

Sections were then forwarded to Professor R. A. Willis, of Leeds University. He expressed the opinion that the sections showed nothing histologically very distinctive, suggesting leprosy as a remote possibility. Ziehl-Neelsen-stained sections revealed a profusion of intrahistiocytic acid-alcohol-fast bacilli. A nasal swab and ear clippings showed moderate numbers of *Mycobacterium leprae*.



Photograph showing squamous erythematous rash on anterior surface of tibia.

When Dr. Orpwood Price was told that the patient was proved to be suffering from leprosy he suggested that he should perform Nelson's treponemal immobilization test on the patient's serum as a matter of interest; this test gave a clear-cut negative result.

Discussion

When a patient with a positive Wassermann reaction gives no history of venereal disease and no convincing clinical evidence of venereal disease, specimens of blood should be examined at monthly intervals to determine the general pattern of the serology. If it is then concluded that the positive reactions are non-syphilitic in nature and are probably in the nature of biological false-positive reactions, steps must be taken to determine the cause of those reactions. Confirmed (to exclude technical error) positive standard serological reactions occurring in the absence of treponemal infection are biological false-positive reactions. Stokes and James (1949) consider that the biological false-positive may be part of a general-infection reaction mechanism shared by many diseases and forms of injury and more highly developed in some persons than in others.

Moore and Mohr (1952) state that the chronic biological false-positive reaction is not innocuous and not to be discussed lightly, but is often, perhaps usually, a manifestation of serious underlying disease. The chief conditions in which such a reaction may occur are leprosy, the allergic diseases such as disseminated lupus erythematosus, periarthritis nodosa, rheumatoid arthritis, rheumatic fever, and sarcoid. Stokes, Beerman, and Ingraham (1944) state that a biological false-positive Wassermann reaction is found in 60-80% of cases of leprosy.

It is of interest that in the present case Nelson's treponemal immobilization test was negative, as this test is claimed to differentiate between true and biological false-positive Wassermann reactions. Nelson *et al.* (1950) state that the treponemal immobilizing antibody does not occur in the serum of normal persons or of those suffering from non-treponemal diseases. They have shown that of 57 lepers seropositive by standard tests (76% of those tested), 47 were negative with the treponemal immobilizing test. The incidence of positive reactions with the latter test was approximately the expected incidence of syphilis in the social and socio-economic groups from which the lepers were drawn.

It is feasible that our patient contracted leprosy as a result of prolonged contact with coloured troops.

Summary

A case of lepromatous leprosy exhibiting a chronic biologically false-positive Wassermann reaction is presented. The importance of considering the possibility of a biological false-positive Wassermann reaction in the absence of convincing clinical evidence of syphilis is stressed. Steps must be taken to determine the cause of the false-positive reaction. Histologically the lesions somewhat resembled sarcoid.

I am indebted to Dr. Douglas J. Campbell for help and advice in the preparation of this paper; to Dr. I. N. Orpwood Price for his interpretation of the serological reactions; to Professor R. A. Willis for his histological report; to Dr. H. Lederer, pathologist, Doncaster Royal Infirmary, for criticism and advice; and to the Department of Medical Photography, Sheffield Royal Hospital, for the photograph.

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Medical Memorandum

Two Cases of Polyarteritis Nodosa with Uraemia

Polyarteritis nodosa is now being diagnosed during life with increasing frequency (Klein, 1949). The following cases manifested general symptoms, particularly kidney involvement with uraemia. The first patient died in a uraemic state, whilst the second apparently recovered.

CASE 1

A house-painter aged 62, the father of three healthy children, was admitted to the surgical department on March 29, with complaints of severe pain and superficial ulcerations in the lower extremities of two months' duration. The family history was irrelevant. He had suffered from bronchial asthma for the past 17 years, and had been using ephedrine to relieve his attacks. Physical examination revealed limited chest excursions with musical rales in both lungs; the heart sounds were muffled, but no murmurs were heard. The blood pressure was 120/70 mm. Hg, and the pulse rate 74. The lower extremities were warm, with small petechiae and small areas of superficial necrosis over the toes and the medial and lateral areas of both legs. The right dorsalis pedis artery was not palpable. The E.S.R. and full blood count were normal, the blood urea was 42 mg. per 100 ml., W.R. and Kahn were negative; a chest radiograph showed increased lung and hilar markings, and the aorta enlarged and elongated.

A tentative diagnosis of thromboangiitis obliterans was made, and periarterial sympathectomy was performed on both femoral arteries (Leriche). At operation the arteries were found to be constricted. The patient made an un-

eventful recovery, the ulceration of both legs improving and after leaving hospital healing completely and never reappearing. He continued to have occasional asthmatic attacks. The pain in the legs recurred three months after operation, but was less severe, and appeared on exposure to cold; he continued thus for about a year and a half, until readmission. Four weeks before this he began to suffer from very severe frontal and occipital headache, accompanied by dizziness, but without vomiting. The headache was severer at night than during the day; analgesics gave relief for a few hours only. He noticed that his legs had become swollen, and two weeks later his face also became swollen, especially around the eyes. On several occasions his urine was red. There was no lumbar pain and no frequency or dysuria. His urine contained albumin, many red cells, and a few white cells and casts. The blood urea was 56 mg. per 100 ml. He looked pale, with slight oedema of the face, especially around the orbits, and of the legs. Physical examination was normal throughout, but there was tenderness on fist percussion over the loins. His blood pressure was 200/120. *Fundi*: Disk boundaries blurred, blood vessels enlarged, arterial reflexes increased, many haemorrhages and cotton-wool exudates.

A few days after admission the patient developed a severe generalized epileptiform seizure, with loss of consciousness and white foam at the mouth. His blood pressure was 250/150. He was given aminophylline intravenously, and the attack subsided. On the sixth day after admission his temperature rose to 102° F. (38.9° C.). He complained of slight pain in the pharynx, but examination revealed no apparent reason for the fever. The white cells numbered 10,800, a few days later increasing to 19,200 per c.mm. The differential count showed a shift to the left, the eosinophils remaining between 2 and 3%. The urine showed no change. Sulphadiazine and penicillin were given with no effect on the temperature. The headaches increased. The blood urea rose to 77-98 mg. per 100 ml. Plasma euglobulin was increased. Cold fraction strongly positive—irreversible at room temperature. On the fourteenth day after admission he developed a slight cough. On physical examination there was slight dullness at the base of the right lung, with many crepitations. An x-ray film of the lungs showed density of the right base. Eye-ground findings showed improvement. The haemorrhages and exudates were absorbed. On the twentieth day the patient complained of abdominal pain; the abdomen was soft and there was no localized tenderness. The white cell count was 20,000 per c.mm., and the urine showed no change.

The protean nature of the complaints—headache, fever, cough, abdominal pain, pain in the extremities, the fluctuating nature of the eye-ground changes, as well as the anaemia, leucocytosis, the increased E.S.R., the blood-protein changes, and the renal insufficiency—suggested polyarteritis nodosa.

During the following week the patient's condition deteriorated. The urinary findings became more pronounced, especially the haematuria. The blood urea increased in a few days from 98 to 262 mg. per 100 ml., and he died on the twenty-sixth day after admission, in a uraemic state.

Typical changes of polyarteritis nodosa in the kidneys, myocardium, liver, spleen, pancreas, and mediastinal fat tissue were seen at necropsy.

CASE 2

A married woman aged 25, with two healthy children, emigrated to Israel from Yemen in 1948. Three years before admission, when she arrived from Yemen at an immigrant transit camp in Aden, she had suffered for a few months from a febrile disease of unknown nature, and apparently recovered. Eighteen months later, a few weeks after arriving in Israel, she started to run a mild fever, fluctuating during the day, accompanied by severe headaches, pain in the neck, shoulders, and abdomen. She vomited three or four times daily. The attending physician suspected pregnancy, since menstruation stopped with the onset of the illness. This condition lasted for a fortnight, after which she felt better, and during the following month

she was able to work in the fields. Every now and then she felt feverish and weak, and suffered from headache and pain in the shoulders and upper abdomen. Albuminuria was found and she was sent to a hospital in town, where she stayed seven months, during which time she had recurrent periods of chilliness, severe headache, abdominal pain, dizziness, nausea, and vomiting. At that time no abnormal findings were detected on physical examination except for an enlarged and tender liver.

During her seven months' stay in the hospital the urine albumin fluctuated between 2 and 4.5%, and the blood urea between 18 and 180 mg. per 100 ml. The sedimentation rate fluctuated, but was always increased. Blood cultures were repeatedly negative, as well as blood examinations for typhoid and brucellosis. Sputum examination for tubercle bacilli was negative. Radiographs of the lungs, spinal column, gastro-intestinal tract, kidneys, and urinary tract did not show any abnormalities. Sternal puncture did not show a deviation from normal. The patient was given penicillin, streptomycin, and aureomycin with no effect on the course of the fever. The general condition continued to deteriorate, the anaemia became severe, and the differential count at one time showed 7% eosinophils. Finally, she was given three blood transfusions, which apparently had a good effect: her temperature became normal and she left the hospital slightly improved and without fever. Erythrocytes numbered 3,000,000 per c.mm.; urine showed albumin ++; blood urea, 40 mg. per 100 ml.

She returned home and felt well for two days, after which she had a new relapse of fever, severe headache, shoulder pain, chills, ringing in the ears, abdominal pain, and vomiting. In addition for the first time she had blurred vision, and also swelling of different parts of the body with itching which lasted for a few hours. A few days later she was readmitted. She was very weak and the state of nutrition was very poor; her skin was pale grey. Physical examination was normal throughout, with blood pressure 130/80, no oedema, and the urine containing albumin 4%; and many red and white cells but no casts. *Blood*: R.B.C., 3,500,000 per c.mm.; Hb 10.5 g.%; W.B.C., 9,700 per c.mm., differential count normal except for 7% eosinophils; reticulocytes 0.9%; thrombocytes, 150,000; bleeding-time, 4 minutes; clotting-time, 3 minutes; sugar, 72 mg. per 100 ml.; urea 52 mg. per 100 ml.; cholesterol, 256 mg. per 100 ml.; Weltmann, 10; total proteins, 7.4 g. (albumin 4 g., globulin 3.4 g.); euglobulin, increased; cold fraction standard urea clearance, 68%. *Sputum*: negative for tubercle bacilli. *Stools*: negative for ova (including schistosomes) and amoebae. *Rectoscopy*: Atrophied mucosa, no ulcers or granulation tissue seen. *Fundi*: Arterial constriction, increased reflexes of the arteries, haemorrhages in all layers of the retina, deep spotted and superficial flame-shaped, some of them being in a stage of reabsorption; multiple cotton-wool exudates. X-ray film of lungs and kidneys showed nothing abnormal. X-ray film of heart: slight left ventricular hypertrophy. E.C.G. normal.

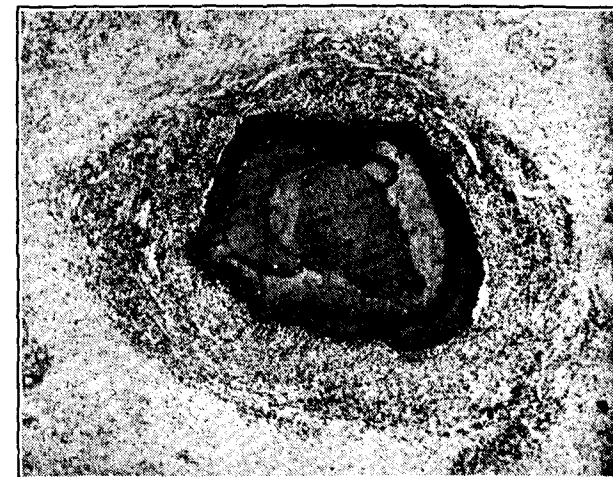
The patient stayed for six weeks in the ward afebrile, while the urine albumin fluctuated between 1.5 and 4%, and the blood urea between 40 and 100 mg. per 100 ml. The eosinophils in the blood increased to 18%; blood cultures were negative several times. Repeated examinations of the fundi showed reabsorption of the haemorrhages and exudates.

A biopsy of the right pectoral muscle was made which, however, was negative for polyarteritis nodosa. Upon further inquiry the pathologist, who had received a biopsy specimen taken before the patient's admission to our hospital, informed us that the specimen showed the typical histological picture of acute periarteritis nodosa—fibrinoid degeneration of the intima and inflammatory changes in and around the arterial wall (see illustration). Decisive proof of the diagnosis was thus obtained.

The patient was in hospital for six weeks, her general condition gradually improving. She gained in weight; the

albuminuria dropped to 0.5%. Blood urea dropped to 39 mg. per 100 ml.; the fundi showed great improvement; and she was discharged in an improved condition. Three and twelve months later she was found to be in good health. The blood count and blood pressure were normal, and the urine contained only traces of albumin. She gained in weight, looked well nourished, had no pain, and was able to perform her household duties and help her husband in the fields.

We were dealing with a disease running for over 10 months with febrile and afebrile periods, severe headache, abdominal and joint pains, normocytic anaemia, slight leukocytosis, and eosinophilia, hyperglobulinaemia with severe and constant involvement of the kidneys, marked rise of blood urea, massive albuminuria, haematuria, severe and



Polyarteritis nodosa. Section through artery of subcutaneous tissue.

rapidly changing eye-ground fundi findings with no hypertension. The fluctuating nature of the kidney manifestations, the febrile episodes, the abdominal pain, as well as the marked leucocytosis with eosinophilia, indicated the presence of a systemic disease leading to severe involvement of the kidney. The absence of skin eruptions and of pathological findings in the heart, and the presence of leucocytosis and eosinophilia, made the diagnosis of Libman-Sachs disease improbable. Subacute bacterial endocarditis was ruled out because of the absence of cardiac involvement, splenomegaly, clubbing of the fingers, and petechiae. The diagnosis of polyarteritis nodosa fitted the clinical picture best.

COMMENT

Prognosis of polyarteritis nodosa has had a better outlook during the past few years. Since the clinical manifestations of the disease are now better known, cases are diagnosed that previously would not have been recognized until necropsy. Our second case, the diagnosis of which was proved by biopsy, manifested clinically severe kidney involvement up to renal insufficiency. This patient made a remarkable recovery, and is now, at least 30 months after the onset of the disease, apparently in good health. The clinical course of this case indicates that prognosis, even when major organs, such as the kidney, are severely involved, need not be fatal.

Acknowledgment is due to Dr. H. Ungar, of the Institute of Pathology of the Hebrew University, Hadassah Medical School, Jerusalem, for the pathological data supplied.

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Reviews

CYTOCHEMISTRY

Cytochemistry: A Critical Approach. By Professor J. F. Danielli. Biological Research Series. (Pp. 139; illustrated. £1 12s.) New York: Wiley and Sons, Inc. London: Chapman and Hall, 1953.

Cytochemistry is a very recent offshoot from the main tree of biological research. As the author of this monograph points out, it has little in common with the essentially morphological approaches of cytology and histology, since the aim of the cytochemist is not to exhibit structure but rather to demonstrate the loci of specific chemical reactions normally taking place within the cell, and, furthermore, to measure their reactions in as quantitative a manner as possible. In this brilliant little book Professor Danielli begins with a general analysis of the possibilities of artifacts arising at various stages in the techniques used; he then proceeds to a description of recent work, a great deal of which is his own, on the localization of phosphatase activity, a form of activity which, to judge by the work cited, would appear to be at the basis of all secretory processes. The Feulgen reaction, which demonstrates the presence of deoxyribose nucleic acid, thereby permitting the staining of chromosomes during mitosis, relies on the conversion of the deoxyribose to an aldehyde; again, aldehyde would appear to be concerned in fat metabolism. Consequently the whole subject of the cytochemistry of aldehydes is of great practical importance, and the author devotes a chapter to this problem.

The relationship between synthesis of protein and nucleic acids is a theme running through most recent cytochemical studies. In the present monograph there is a valuable assessment of the recent work of Brachet and Caspersson among others. According to the author the claim that nucleic acids are concerned in protein synthesis is well grounded, and he puts forward the suggestion that the nucleic acids can influence or determine the folding of the newly synthesized protein chains, thereby imparting their specific characteristics. In a final chapter the future outlook in cytochemistry is briefly reviewed. The author points out that biochemistry, concerned as it is with homogenates, pulped tissues, and tissue extracts, is very indiscriminating in that all cells of an organ are usually treated as equal, whereas the cytochemist is well aware of the wide differences in chemical composition that often exist among cells of apparently the same histological type. He expresses the hope that the combination of the present indiscriminating approach of biochemists, and the more perceptive but undeveloped techniques of the cytologist, will be richly rewarding.

Written by a brilliant investigator, whose original contributions to the science of living matter have carried him into the very front rank of modern biologists, this monograph, by virtue of its critical yet imaginative approach, may justly be regarded as a masterpiece that will guide for years to come present and future investigators in this new branch of biology.

HUGH DAVSON.

INTRODUCTION TO RADIATION BIOLOGY

Radiations and Living Cells. By F. G. Spear, M.D., M.A., D.M.R.E. (Pp. 222; 60 figures. 18s.) London: Chapman and Hall, 1953.

This small volume is a most useful addition to the textbook literature on radiation biology as an introduction to the subject for medical and postgraduate students and for those workers such as physicists in allied branches of biological science. At the end of the book a bibliography suggests future reading of a mixed type to follow this initiation into the subject.

The author has throughout made clear the nature of the tissues and cells to which his descriptions of radiation effects apply, and this to the tyro is of tremendous value. He discusses the effects of radiation on cells generally and

on the various tissues—adult, embryonic, or malignant—and refers to much experimental work and to theories of how radiation acts on cells. The book is well printed on good paper, in a form handy for the pocket. The illustrations are particularly clear and apposite.

Criticism of defects is always distasteful, but there seems to be an error in the labelling of Fig. 6, and it seems an error to refer to any cell divisions taking place in normal meiosis as "highly abnormal" (p. 24). The note about Sr⁹⁰ retention (p. 149) leaves one ignorant of the method of administration. The importance of oxygen tension in connexion with cell sensitivity could profitably be discussed in view of its importance in clinical and experimental work, and it seems wrong to suggest that dose rate dependence is not compatible with the larger hypothesis of radiation (p. 195). The balance of language could be adjusted a little: "to equate the immaturity of normal cells with the anaplasia of malignancy" is on the same page as "what is called the atomic number."

These criticisms should not deter anyone from reading and keeping the book. It will be a great help to all starting an interest in radiobiology, while among radiotherapists and hospital physicists, who all know of Dr. Spear, it will enhance his already excellent reputation.

FRANK ELLIS.

CANCER IN CLINICAL PRACTICE

Basic Principles of Cancer Practice. By Anderson Nettleship, M.D., F.A.C.P. (Pp. 398. £2 14s.) London: Baillière, Tindall and Cox, Ltd. 1952.

In this book a professor of pathology tries "to tell something of what is known about cancers as clinical entities." The book is written primarily for the general practitioner and medical student. He gives a brief general description of the pathology, methods of diagnosis, and main lines of treatment of the various forms of cancer, and follows this with short accounts of cancer as it affects the various organs and regions of the body. There is also a chapter on cancer research and another chiefly on the medico-legal aspects of cancer. The facts are clearly stated and the author speaks with authority on pathological questions, but the clinical part is rather brief and scarcely sufficient for the medical student, who will need to supplement his clinical knowledge of the various cancers from textbooks on surgery.

We were interested to learn that "the improvement of cancer diagnosis by indoctrination of lay audiences has steadily lost its effectiveness," and felt some comfort in the words of a pathologist to the effect that "cancer research is too complex to be well understood even by its disciples." We hope the author is correct in his surmise that "there will probably never be the need for a large group of cancer specialists from whom the patient will first seek treatment," and can endorse his opinion that "it seems wise, therefore, that general practitioners become general oncologists, with a sound approach to the fundamental problems in each field" (the word oncology means the science or the study of tumours). This is an interesting book and there are over a hundred illustrations, but we wish the index were fuller.

ZACHARY COPE.

MENTAL DEFICIENCY

Notes on Mental Deficiency. By J. F. Lyons, L.R.C.P.&S.I., D.P.H., D.P.M., and W. A. Heaton-Ward, M.B., Ch.B., D.P.M. (Pp. 48. 3s. 6d.) Bristol: John Wright and Sons, Ltd. 1953.

The object of this booklet is to provide the newcomer with a practical guide to the administrative aspects of mental deficiency practice and to give a sufficient treatment of clinical and aetiological factors, and of the objects and methods of care and training. In that it gives a simple outline of the subject and is written mainly from the hospital point of view, it will be helpful to nurses training in mental deficiency, and it may also be useful to social workers and duly authorized officers concerned with the community care of the mentally handicapped. The necessary pruning of essentials has, on the whole, been well done, although some

of the space devoted to outworn aetiological theories might better have been devoted to the recent important work on intrauterine and genetic factors. Although it is not easy to explain hereditary influences to the layman in such small compass, an attempt to do so might well have replaced the description of the causes of "vitiation of the germ plasm." On the clinical side, too, the sections devoted to a few arbitrarily chosen rarities such as gargoyism and lenticular degeneration seems to be quite unnecessary and the system of headings in this section is rather confusing.

The need for a handbook of just this size and readability is great, and its appearance will therefore be welcome to lay workers in this field. But it must be said that the interpretation of the working of the Mental Deficiency Acts, and indeed the administrative sections generally, are much clearer and more up to date than the clinical sections.

ALEXANDER KENNEDY.

THORACOSCOPY

Operative Thorakoskopie. By Dr. Stanko Dujmušić. German translation by Dr. Rudolf Herz. (Pp. 222; 204 figures. M. 48.) Vienna-Düsseldorf: Wilhelm Maudrich, 1953.

This volume is a monograph on thoracoscopy and on its use in overcoming the difficulties which may arise in the production of a satisfactory pneumothorax for the treatment of pulmonary tuberculosis. The method was first developed by Jacobaeus, the distinguished Croatian surgeon, whose pupil and successor the author was. Although the subject is a limited field it is one in which experience and fine technique are essential to success, and these it is obvious that the author possesses in an exceptional degree.

The anatomy of the thoracic cavity as seen through the thoracoscope is fully described and illustrated by admirable coloured plates and diagrams, and there follows a discussion of the mode of formation of pleural adhesions and of their physical characters. The division of these adhesions is the chief problem of thoracoscopy, and the whole technique of this procedure is described in great detail, beautifully illustrated in colour. The various difficulties which may arise and their avoidance are discussed, as well as the possible risks. It would be difficult to imagine a more complete and precise treatise on a limited but important subject, and thoracic surgeons will find its perusal well worth while, even if their knowledge of German is limited. It is indeed a mine of accurate information admirably presented.

HENRY SOUTTAR.

LUNG ZONES

Pathologie et Structure Pulmonaires. By Professors H. Warembourg and P. Graux. (Pp. 221; 94 figures and 64 plates. 2,500 francs.) Paris: Masson et Cie. 1953.

The natural division of the lungs into lobes has served well for many purposes, but a new conception of lung structure has been taking shape, and the future specialist in lung diseases may have as much regional anatomy to learn as the neurologist. The modern view is that the lung is a segmented or zoned organ, each zone being self-contained and separated from its neighbours by connective tissue, with or without a fissure as well. This independence of the zones is not only anatomical but also clinical and pathological, and so we may have "zonitis" in many different sites. The final map of the zones has still to be drawn, and the nomenclature has yet to be standardized, but enough progress has been made to warrant the comprehensive survey here provided.

This could well be described as the book of the zone, for its scope is wider than that of the authors' *Pathologie des Zones Pulmonaires*, published in 1947. It opens with a historical introduction describing the evolution of the zone concept, from Ewart's adumbration of it in 1889 to the present day. The first part of the book gives the general anatomy of the bronchial tree, arterial tree, pulmonary veins, bronchial arteries, lymphatic system, and nerves of the lung. The second part deals with the anatomical, clinical, and radiological aspects of the individual zones in

the three lobes of the lung, and ends with sections on the fissures and on the bronchi and bronchoscopy. The third part is devoted to pathology, and covers the main diseases of the lungs and bronchi, including malignancy, the final sections being on angiopneumography and zonectomy. The authors add a substantial and up-to-date bibliography of works in the chief European languages. The illustrations—many of them chest radiographs—are excellent.

The appeal of the book is unusually wide for a specialist work, since the subject is treated from the different viewpoints of the anatomist, radiologist, pathologist, physician, and surgeon. All these could read the whole work with pleasure as well as profit, for the authors' French is concise and easy.

RAYMOND WHITEHEAD.

CONTACT DERMATITIS

Contact Dermatitis. By George L. Waldbott, M.D., F.A.A.A., F.A.C.A., F.I.A.A., F.A.C.P. (Pp. 218; 131 figures. £3 3s.) Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

To play the detective has a great fascination for the physician, and the dermatologist is in a favoured position for this game. The characters and distribution of an eruption may enable him to show a knowledge of the patient's habits and pursuits or of his possessions which suggest the touch of magic. The industrial medical officer may be able to carry these observations to such a point as to know with certainty the exact phase in a particular process which has been responsible for a pattern of skin reaction in a workman. Some years ago under the title of *Occupational Marks* Dr. Ronchese¹ published a book on such industrial stigmata.

Dr. Waldbott, an allergist, has been impressed by the diagnostic significance of the patterns of reaction from external agents and has now written this monograph on the subject. He does not define his title. Some dermatologists include under it all forms of eczematous dermatitis produced by external agents, while others limit its use to those forms dependent on an allergic sensitization to an external contact, excluding primary irritants. It is in the latter sense that Dr. Waldbott uses the term "contact dermatitis." The work is well produced, on excellent paper, with 131 illustrations, most of which are clear and instructive. The author suggests that the work may be studied by the patient with contact dermatitis, to assist him in doing his own detection. This accounts, no doubt, for a semi-popular presentation and a rather unnecessary number of illustrations. It is a novel way of obtaining the patient's co-operation, but it seems to have been attended by some success. The work is interesting and amusing, as well as being instructive, and it will form a useful book of reference for the dermatologist and for the general practitioner who is sure of his diagnosis.

With the increasing complexity of the chemical character of our external contacts, there is a great increase in sensitization dermatitis from such sources. Dermatitis of this type may masquerade as constitutional eczema for years when recognition and removal of the cause would be immediately curative. Yet diagnosis is often fraught with difficulty, and it is dangerous and unwise to depart from fundamental principles and to accept the diagnosis of contact dermatitis without adequate proof. The neglect of history-taking and of necessary investigative procedures is not to be encouraged.

The author illustrates many interesting patterns of contact dermatitis on fingers and hands, some of which seem a little too good to be true and are certainly not as often encountered in practice as could be desired. It is difficult to go all the way with the allergist in his approach to the problem of pruritus ani and pruritus vulvae. The book as a whole is stimulating and concerns a field that is constantly expanding, but it is rather extravagant in size and in price.

J. T. INGRAM.

¹*Occupational Marks and Other Physical Signs*, 1948. Grune and Stratton, New York.

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ANTIMALARIAL DRUGS

Because of strategic necessity research on antimalarial substances was vigorously pursued during the last war, and there has since been little slackening of the tempo. This is as it should be, for malaria is still probably the greatest killing disease in the world. The important work of Fairley and his colleagues put on a sound basis the therapy of malaria with the drugs in use during the war, but since 1946 experiments as comprehensive as his have not been possible. Thus pyrimethamine was at first thought to be very useful for the treatment of acute attacks of malaria, but this conclusion was reached after therapeutic trials in Africans who were partially immune. It is now known that in non-immune patients the drug acts slowly, and its unaided use in fulminating attacks may be dangerous and ought to be discontinued. Goodwin,¹ however, reported that it is an effective suppressant, and Coatney and his colleagues² showed that when individuals taking suppressive pyrimethamine are bitten by mosquitoes conveying *Plasmodium vivax* the onset of malarial symptoms may be indefinitely delayed. This implies that the drug has an effect on either the pre-erythrocytic or exo-erythrocytic forms of *P. vivax*, and the observation led to the hope that in overt malaria treatment with pyrimethamine would destroy exo-erythrocytic forms in the liver and late relapses would thereby be inhibited. On another page in this issue Sir Gordon Covell and his co-workers have now shown that these relapses are not inhibited, and it is thus clear that the exo-erythrocytic forms of the parasite survive the doses administered. But the possibility remains that the pre-erythrocytic forms may be susceptible to the drug. If this is so the drug still constitutes an important advance in malarial therapy, for when taken in suppressive doses the development of these overt attacks (and all later phases of the parasite) and late relapses would be inhibited.

In a letter at page 285 Lieutenant-Colonel Taylor draws attention to the fact that *P. falciparum* infections may occur among those taking pyrimethamine.

His observations dovetail to some extent with those of Dr. B. M. Nicol reported in last week's *Journal* (page 177). The latter found that attacks of malaria occur, though not with equal frequency, among people taking proguanil, mepacrine, or quinine. When given in correct dosage the complete effectiveness of mepacrine as a suppressant has been proved beyond doubt. In fact during the last war members of the Forces who developed malaria in areas in which mepacrine suppression was in force could be charged with indiscipline for failure to take the drug. In Nicol's series, out of 21 persons who stated that they were taking mepacrine regularly 14 said that while doing so they had had malaria. If the malaria in these 14 patients was correctly diagnosed their statements that they had taken the drug regularly must be considered unreliable. In view of this, the claims of those taking other drugs must be suspect. Nevertheless such studies are useful, for they show how much the drug can accomplish in spite of what is almost certainly irregular dosage.

The absolute capacity of a drug to suppress an infection can be assessed only under strictly controlled conditions. Nicol appreciated this and emphasized that his information was dependent upon such doubtful factors as the patient's memory and knowledge of the method of diagnosis in his or her case. It is, however, clear from his study that in spite of human inconsistency individual prophylaxis with proguanil is highly effective, only 6 out of 203 individuals taking 100 mg. of the drug daily having had proved attacks of malaria. Suppression was much less satisfactory in those taking mepacrine or quinine.

In investigations of the therapeutic efficacy of antimalarial drugs the most important point to determine is the effect of the drug in non-immune persons who, preferably, have not been to the Tropics. If the results of drug treatment are satisfactory in them, then they must also be satisfactory in those in whom its action is assisted by immunity. In asserting that two of his patients required intramuscular quinine Lieutenant-Colonel Taylor raises a matter which was discussed in the correspondence columns of this *Journal* during the latter part of 1951 and early in 1952. The position was summarized at the time in an annotation.³ Sir Philip Manson-Bahr also discusses the use of quinine in his letter at page 284 and inquires why it has of recent years been relegated to obscurity. To this surely the answer is clear. If speed of action is required quinine must give pride of place to chloroquine, while for prophylaxis it is known to be incompletely effective against *P. falciparum* and to engender blackwater fever. It seems that Sir Samuel Gee's utterance needs modifying to "Go on using your

drugs as long as they cure, but don't cling to those that sometimes kill when you have found others to work safely."

For the treatment of acute attacks of malaria chloroquine appears to be the most rapidly acting drug⁴ and for fulminating or cerebral *P. falciparum* infections is best given intravenously in a saline drip. Intramuscular or intravenous mepacrine is probably the most satisfactory alternative to chloroquine, but the use of quinine in these cases is inadvisable in view of the risk of blackwater fever, and pyrimethamine and proguanil should also not be given unaided for such infections, as Sir Gordon Covell has recently emphasized in a letter to this *Journal* (July 4, page 41). For malarial suppression proguanil is the drug of choice, for it combines effectiveness with absence of toxicity, while it is the only drug known to be a true causal prophylactic in *P. falciparum* infections. It may be found that pyrimethamine also has such an effect against this parasite and *P. vivax*. If this is so, it will mean that a drug has at last been found which when taken prophylactically prevents late relapses of benign tertian malaria. Finally, it cannot be too firmly stressed that quinine should not be used for suppression. In maximally tolerated doses it has been found to be ineffective and to lead to latent or to recrudescing infections in the presence of which blackwater fever is liable to develop.⁴ An important result of the introduction of the modern antimalarials is that in communities in which they are used in proper dosages blackwater fever is abolished. This in itself has led to great saving of life.

THE PLACE OF THE HOSPITAL

The administrative structure of the National Health Service has been the subject of much comment and criticism since the Acts creating it were passed, and five years' experience of its working has shown that much of the criticism is justified. In his Croonian lectures published in this and last week's issues of the *Journal* Sir Allen Daley sets out his reflections on some of the problems confronting us in the light of these first five years of the N.H.S., and he maintains, "It is recognized generally that a weakness of the new Service is the division of its administration into three separate compartments." There will be much support for this point of view, but far less support for the solution which he propounds—namely, to go back to the Willink proposals for a number of joint area authorities for hospital services.

Sir Allen surveys the scene as a former medical administrator with a special interest in preventive medicine, and sees "no clear or logical line of

demarcation in the present distribution of function between the three branches of the Service." He considers the tripartite separation of functions between hospitals, general practitioners, and local health authorities as artificial and illogical, and shows how efficiency is impaired by such separation when close integration is so essential—in the prevention and control of infectious disease, in tuberculosis, in the care of the chronic sick, in mental health, and in the maternity services, where the "interlocking of function is most pronounced." Another difficulty he points out is in deciding whether a person is aged and infirm or can be regarded as one of the chronic sick, and he says, "However broad the dividing line, one must be fixed somewhere, as a hospital authority cannot be expected to provide accommodation for the aged and infirm, though when local authorities were responsible for both hospitals and welfare institutions the exact definition was not of great importance." And now there is the further complication that if the hospital authority accepts the patient no charge is made, whereas if the local health or welfare authority does so the patient is assessed for payment. He also sees "a change which is not an improvement and which follows the thesis that hospitals are responsible only for patients for whom treatment is likely to be beneficial, and if no further benefit is likely they become the responsibility of the local health authority."

In view of these difficulties, and the tendency to isolate the general practitioner from the hospital, everyone will agree with Sir Allen's observation that "all who work in it should realize that there is only one National Health Service, and that all proposals for development and change should be discussed with representatives of the other services whose own work in some way or another is likely to be affected." At this point Sir Allen says, "Some may feel that the only logical solution of all these administrative difficulties is to have for each area one, and only one, body responsible for the administration of all three branches." He recognizes, however, that the practical difficulties at this stage are insuperable, but feels that it is not unrealistic to go back to the Willink proposals, which would ensure a much closer association of the hospitals with the other two branches of the Service. This is related to the thorny problem of the reorganization of local government boundaries, which would in itself greatly help co-operation between the hospital services and those of local government. Sir Allen's observations on unifying the administrative structure should be studied very carefully. It is a problem that will sooner or later have to be faced, with the associated problem of whether the unified administrative body should be elected or nominated.

¹ Goodwin, L. G., *British Medical Journal*, 1952, 1, 732.

² Coatney, G. R., et al., *Trans. R. Soc. trop. Med. Hyg.*, 1952, 46, 496.

³ *British Medical Journal*, 1952, 1, 590.

⁴ Fairley, N. H., *ibid.*, 1949, 2, 891.

Meanwhile what is to be done to encourage a greater sense of unity in the Service, and how in particular can the hospitals help? This is a challenge to those working in the Service to try to overcome the weaknesses in the present administrative structure. Any interim solution which multiplies the amount of time spent on paper work and increases the existing plethora of committees is rightly condemned. Formal meetings are not essential for this type of co-operation, and much can be done by personal consultation even on the telephone. The hospitals have an important part to play in this integration, but the "hospital is not the centre of gravity of the Service any more than the general-practitioner service or the public health service is the centre of gravity." The tripartite partnership is one of equality of status.

Observing that hospitals should take a more active part in preventive work—a theme discussed in these columns recently¹—Sir Allen points out that "there can be no clear-cut line of demarcation between the work of hospital and health authorities so far as preventive and curative medicine are concerned." The special hospitals, of which there are many, have a role quite as important as that of the acute hospitals, and, in the planning of hospital facilities for the chronic sick, chest cases, mental defectives, and so on, he pleads for a closer association between the hospital board, general practitioners, and public health officers. By associating at the planning stage, all the partners in the Service will gain in understanding each other's needs. He agrees too with those many critics who have contended that general practitioners should have hospital beds in their charge, that they should have prompt reports, access to pathological and radiological facilities, and be welcomed in the hospitals. Not only is the patient thus benefited, the doctor is helped to keep up to date. Hospitals should also make full use of the services of the medical officer of health in the prevention and control of infectious disease, and should join with him in research into the amount and nature of the sickness in the community. In these and many other ways Sir Allen feels that hospitals should play their part in the preventive services and "supply the needs of the other two branches of the Service."

These lectures should be closely studied by everyone concerned with the running of the Service, for apart from Sir Allen's main thesis, outlined here, he makes many pungent and timely comments obviously intended to be controversial on a variety of topics. As to regional boards, for example, he avers that "many think there are too few, that the original conception of between thirty and forty would have been

better." Discussing the functions of the Ministry of Health, he states that it "undertakes to an increasing extent executive responsibility and issues directives about the management and staffing of hospitals." And he poses, but avoids answering, the question whether this is a more tolerable method of control than the former executive control of local authority hospitals by the local authorities and their officers.

CHRONIC BRONCHITIS

Now that rickets has ceased to be a major problem its characterization as the English disease might well be transferred to chronic bronchitis, which alike appears to be a typical product of the English weather and murky towns. As a cause of death, sickness, and chronic disability it is of primary importance, and it is anomalous that as a subject for research it has until recently been accorded scant attention. The report in our opening pages this week by N. Goodman, R. E. Lane, and S. B. Rampling, from the Nuffield Department of Occupational Health, Manchester, draws attention to those outstanding epidemiological features of the disease which are likely to prove the most fruitful starting-points of a search for methods of prevention.

That the disease is commoner in Britain than in some other parts of the world is shown by comparison, for instance, with Scandinavia. For men aged 50 to 60 the death rate from bronchitis in 1948 was 50 times as high in England and Wales as it was in Norway and Sweden. But the incidence is not equally high in all parts of Britain, nor in all sections of the population. It is two to three times higher in towns than in the countryside, and twice as high in the north and west as in the drier south and east. According to the Registrar-General's occupational mortality statistics the disease is five times as common among both men and married women of the poorest economic class as among members of the professions. The explanation of this may lie in the overcrowding and consequent greater ease of infection associated with poverty. The origins of the disease may perhaps be found in the conditions under which infancy is passed—when, for example, respiratory infections are so common among the children of the poorer-paid citizens. It is striking that, in Britain, the chronic disease appears principally in men, even though morbidity data all agree that the acute condition occurs equally in both sexes, if indeed not more often in women. The difference may, perhaps, be due to constitutional factors, but it is certainly worth inquiring whether alternatively it may not be due to the different work habits of men—the greater physical effort undertaken by some whilst still suffering an acute infection—or to their different smoking habits.

With the experience of last winter's fogs fresh in the memory it cannot be doubted that atmospheric pollution is responsible for aggravating the disease and for hasten-

ing the death of a large number of sufferers. But whether it is responsible for starting the disease is a question on which there is at present no evidence. Until proved otherwise (if it ever is), pollution of the air must be regarded as a likely cause of the first importance. Similarly fresh—often virus—infections are clearly responsible for a high proportion of acute exacerbations, although, to quote Stuart-Harris and his collaborators,¹ "No one has ever found an infective agent which could with confidence be described as an actuating cause." They found that pneumococci were frequent inhabitants of the sputum in all phases of the disease, but that the types came from the whole range of the species, and the distribution resembled that found in the healthy nasopharynx more closely than that in the sputum in cases of pneumonia. In the past it has been suggested that *Haemophilus influenzae* might be of particular importance, and May² has recently confirmed this possibility. He realized that the apparent variation in the predominant organisms in the sputum might be due to irregular distribution, so that the appearance of any particular one might be determined largely by chance in the selection of the portion of sputum for culture. By a system of random sampling of the sputum he found that both those organisms which have seemed to be responsible for the infective element of the disease—*Haemophilus influenzae* and *Pneumococcus*—are those which are distributed most irregularly and so most likely to be missed on occasions. Chemotherapy designed to eliminate them can give much temporary relief of symptoms. But no method has yet been found which will prevent reinfection as soon as the patient returns home and is exposed to the family cold.

DIAGNOSIS OF POLIOMYELITIS

The rising incidence of poliomyelitis, illustrated at present by a graph every week in our Vital Statistics section, means that many family doctors will have the anxiety in the next two months or so of considering whether one of their patients has the disease. The earlier the diagnosis, the more effective can be the measures taken to mitigate the consequences of the infection. The patient's life, indeed, can depend on early treatment.

Two phases of the disease may be distinguished. The first of these is called the minor illness. It represents the body's response to infection and concludes the incubation period of about seven to ten days (or occasionally longer). The symptoms are similar to those of many other acute infections, and commonly include headache, malaise, and shivering. There may also be sore throat and perhaps gastro-intestinal disturbances. Pyrexia may be slight, and together with malaise may be the only manifestation of infection. The inference that the infection is poliomyelitis may sometimes be drawn when a patient is known to have been in contact with a recognized case. The family doctor faced

with such an early case may wonder whether the patient should be isolated at home or sent into hospital, and whether or not the case should be notified. The medical officer of health may be asked to take the responsibility to decide. Many cases end with this phase, the attack then being termed abortive. A few go on to the so-called major illness, when paralysis may or may not occur.

The principal disturbances in the major illness are meningeal. Headache is almost invariably present and is usually supra-orbital and persistent. Vomiting, often repeatedly, is very common. Alertness, apprehensiveness, and sleeplessness are notable rather than drowsiness. Certain signs may be elicited, of which the most important is stiffness of the posterior cervical and back muscles. The neck and back may be poker stiff, but the head is not retracted. Kernig's sign is often present. Neck or back stiffness may be so slight as to be detected only by the patient's inability to kiss his bent knees. Differential diagnosis at this stage is from pyogenic meningitis and, if the cerebrospinal fluid is lymphocytic, tuberculous meningitis; but the possibility of other virus infections of the meninges should also be borne in mind. Epidemic myalgia (Bornholm disease)¹ may be of increasing importance in the differential diagnosis. Meningismus can be misleading; there the C.S.F. is normal, but so it may be occasionally in poliomyelitis. Other common causes of error are local inflammation in glands or tissues of the neck giving rise to an impression of meningeal rigidity. Some patients are found on further observation to have rheumatic conditions.

When paresis or paralysis occurs, it is rarely seen earlier than 48 hours after the first symptoms of the major illness. When gross and asymmetrical, with weak or absent reflexes, there is rarely difficulty in diagnosis. Slight pareses are very easily missed. Paralysis may spread for several days after its first appearance. When paralysis is quite symmetrical and associated with some sensory impairment, a toxic cause should be suspected. Brachial radiculitis is not uncommonly confused with poliomyelitis. In hysterical paralysis the tendon reflexes remain active. Many cases of pseudo-paralysis are also seen—in the immobilization, for example, caused by osteomyelitis or rheumatism.

Apart from the diagnosis of the disease, the early recognition of serious complications may be life-saving. In the bulbar type death often occurs from the patient's inability to keep his airway free from secretions. Speech difficulty and weak cough may indicate the necessity for prompt postural drainage. Weakness of the shoulder girdle may point to respiratory muscle paralysis. This should be carefully investigated, for it may be insidious in onset and later rapidly progressive. An increasing tendency to sleeplessness and apprehension may suggest this complication, and a simple test, such as the patient's incapacity to count far in one breath, may demonstrate it, as also will a feeble cough. Finally, urinary retention due to temporary bladder paralysis is common, especially when the lower extremities are involved, and is apt to be overlooked.

¹ *Quart. J. Med.*, 1953, n.s. 22, 121.
² *Lancet*, 1952, 2, 1206.

¹ *British Medical Journal*, June 20, p. 1379.

THE KING'S FUND

Apart from its "rich uncle" role, the King Edward's Hospital Fund for London has had a co-ordinating influence on hospital affairs in London and has helped hospitals to find practical solutions to their problems. If the Fund had not been in existence when the hospitals were nationalized some other body would have had to be created, probably on not nearly so good a pattern nor so rich in resources, to stand for the partnership between the State and voluntary service in hospital administration. Although it has made large grants and appropriations—£271,000 under these headings in 1952—the Fund has never been a mere distributor of largesse. Nor has it, since its earliest years, ever entered the field in competition with individual hospitals for subscriptions. Subscriptions are certainly welcomed, but the income from subscriptions and donations last year was only £11,500. From legacies—and there are indications that testators who would formerly have left their money to individual hospitals are now making the Fund their beneficiary—it received £65,000. But its income from investments and properties was more than one-third of a million. The Annual Report for 1952 sets out the various purposes for which grants have been made—purposes which are often designed to make life in hospital more agreeable for the patients. For instance, many hospitals have been helped to improve their gardens, often with the co-operation of the Royal Horticultural Society. The Fund also maintains important services for the benefit of hospitals collectively, such as the Emergency Bed Service, the Hospital Administrative Staff College, and the School of Hospital Catering. New ground was broken last year in the organization of courses in administration for trained nurses. Another new enterprise of the Fund is the setting up under the wing of the hospital service of convalescent homes for the aged sick. A sum of £350,000 has been set aside for this purpose. The plan is for twelve homes, all in the environs of London. Seven are open and three others are being built. All four Metropolitan Regional Hospital Boards have agreed to meet the maintenance costs. Each home is linked with a hospital where the medical staff is actively interested in the care of the elderly. All are managed by voluntary organizations, the lion's share being borne by the British Red Cross Society. The idea is to facilitate the patient's discharge from hospital, rather than to provide beds for the chronic sick. The first of the homes, with 30 beds, admitted 222 old people during the first 22 months of its existence. The capital cost for the first seven homes was £870 for each bed.

The control of hospital expenditure is a subject which has been discussed recently, and the report points out the three alternatives—curtailment of services, reduction of standards of service, reduction of expenditure. No hospital would wish to adopt the first or the second. Whether the third is possible remains to be seen, but the author of this report evidently thinks something can be done to reduce duplication and overlapping, which have wasted capital and greatly increased maintenance costs. The report continues: "Has not the time arrived for a backward swing of the pendulum; the

time to resolve the balance of functions; the time for hospitals to ask not, 'How much more can we get to spend?' but, 'How much can we reduce our demands?'"

EATING BEHAVIOUR

Provision for feeding industrial workers in canteens has made immense strides in recent years, and this has brought with it many problems, of which the most obvious are dietetic and economic. It is surprising that until recently these problems have not been studied in their social context. The significance of the meal as a social occasion as well as a means of refuelling the human machine should have been plain enough to the business man, who could have obtained useful advice on the subject from any group of housewives. But by and large the "industrial caterer" has been content to go his own way and to try to develop an efficient service by studying such relatively simple questions as refrigeration, protein content of various foods, and so on, rather than problems of how to feed A and B, regarded as human beings rather than experimental subjects.

This is simply not good enough, because different kinds of workers take advantage of canteen services in different ways. For instance, Cook and Wyndham,¹ in a report of a recent study of the subject carried out in Australia, point out that administrative staff tended to use canteen services much more often than production staff. As this preference could not be satisfactorily explained in terms of economics, an investigation was made into the circumstances in which the worker feels "at home" in the more intimate moments of feeding, and it was found that they varied greatly from one group of workers to another. The point is an important one, and investigations carried out to discover what domestic arrangements should be made in works canteens may lead us a long way to understanding social phenomena about which we now know much too little. The task thus set may prove to be unexpectedly difficult—and unexpectedly rewarding—for no elaborate psychiatry is needed to show that complaints about canteen food or seating arrangements may be symptoms of much more profound tensions in industrial relationships. The maxims that restful surroundings promote good digestion and that good feeding promotes good work are simple, but their practical application may be intensely complicated.

The Australian report discloses that upholstered seats were reserved in the canteens for administrative workers—a somewhat surprising fact that hardly tallies with the popular conception of Australian social behaviour. We are left in doubt whether this had anything to do with the unpopularity of the service to the industrial workers. The final conclusion appears to be the unsatisfactory one that "it all depends." Even so, grumbling about quite good food is frequent enough in British factories. It is usually taken to be a symptom of bad morale, but the problem is rarely probed at all deeply.

We record with regret the death on July 26 of Dr. Mervyn Gordon, consulting bacteriologist to St. Bartholomew's Hospital. He was 81 years of age.

¹ Cook, P. H., and Wyndham, A. J., *Hum. Relat.*, 1953, 2, 141.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

CORTISONE AND A.C.T.H.—I

BY

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The administration of A.C.T.H. or cortisone raises the concentration of adrenal cortical hormone in the circulating blood and presumably also in other body fluids. This may be of very great benefit at certain stages in a variety of disease states, but why this should be so is still by no means clear.

There is abundant evidence that animals and indeed humans without adrenal glands resist the stresses of trauma, infection, toxic substances, and adverse environmental conditions much less well than do those with healthy adrenal tissue. There is also plenty of evidence that the adrenal cortex is very readily stimulated by such stresses to liberate increased amounts of adrenal cortical hormone into the blood stream. Even psychological stress will produce this result: screwing up one's courage, for instance, involves such adrenal cortical stimulation. It would seem that the increased concentration of hormone in the blood helps the cells of the body to resist adverse trends in the internal environment, though how this is achieved is unknown. It may be that the adrenal hormones strengthen the cell membrane or lower its permeability. It has been suggested that the adrenal cortical hormones provide the cells "with an asbestos suit protecting them from the fires of infection." Although such a statement explains nothing, it nevertheless provides a useful working concept of what it is hoped to achieve by therapy with A.C.T.H. or cortisone. Such a concept takes no account of specific diseases; it merely considers disease in general as a damage to the tissues of the body. But this is the proper way to regard the use of cortisone. The results of therapy are quite empirical and little is to be gained from pushing theory further than this simple generalization.

A substance with so fundamental an action brings its own responsibilities: it must not be given indiscriminately. By protecting against disease, it may reduce or eliminate some of the traditional signs or symptoms of disease. Thus the temperature associated with infection may be reduced to normal, even though the infection itself persists or even extends; the malaise of a toxæmia may be eliminated, even though the disease causing it is unaffected; the sedimentation rate, an important clinical sign of disease, may be reduced to normal. With all these improvements in the state of the patient a false sense of security may be produced in those in whom the disease process is not actually under control. Perforation of gastric ulcers and extensive peritonitis have occurred in patients on cortisone, and have remained undiagnosed because the traditional indications of the catastrophe were masked. Because of such dangers, it is of great importance that a complete diagnosis should be made before cortisone or A.C.T.H. therapy is attempted. These drugs should never be given as a last resort to patients with undiagnosed disease who appear to be resistant to the more usual forms of treatment. They must not be regarded as the last refuge of the therapeutically destitute. Cortisone and A.C.T.H. are not known to cure any disease: they only alleviate some of the manifestations;

other aspects of the disease process may remain unaffected, and to these the patient may still succumb, in spite of full cortisone therapy.

As already stated, the essential process in A.C.T.H. or cortisone therapy is to raise the concentration of adrenal cortical hormone in the circulating blood. The hormone concerned is very probably a steroid called compound F (17-hydroxycorticosterone). Its chemical formula is known and it can be manufactured. It can be detected in small amounts in blood or body fluids and occurs in higher concentration in the blood of the adrenal vein. Although cortisone itself, which is a mildly oxidized relative of compound F, is probably absent from circulating blood, it has very much the same physiological actions as the natural hormone. It is likely that cortisone acts by being converted into compound F within the body. When compound F becomes available commercially it will probably prove even more effective than cortisone.

Principles of Therapy

Cortisone is usually supplied either as tablets of acetate to be taken by mouth, or in the form of a suspension of finely divided crystals of cortisone acetate in a saline medium, suitable for intramuscular but not for intravenous injection. It is stored at room temperature.

When cortisone acetate is taken by mouth it is quickly absorbed and the therapeutic effect is rapid, but the amount in the blood falls back in a few hours to its original level. It is therefore best given twice a day or oftener. Cortisone acetate injected intramuscularly behaves differently. It is relatively slowly absorbed and much will often persist at the injection site after 12 or 24 hours. If daily injections are given, more and more will collect at the injection sites, producing a depot of cortisone which is only slowly absorbed. Blood levels will thus rise more slowly than with oral cortisone, and the maximum effect may not be attained until injections have been given for several days. When injections cease, absorption will often continue from these depots for a week or more. Therapeutic effect will thus diminish gradually. The cortisone acetate suspension can be given orally if desired. It is readily taken mixed with a little milk, and is then rapidly absorbed.

When cortisone is administered by either method the patient's own adrenal glands tend to be inhibited and gradually pass into a state of disuse atrophy. This is not a serious matter if cortisone continues to be administered, but if therapy is suddenly stopped the patient may find himself without either administered or self-produced hormones and may pass temporarily into a state like Addison's disease. To avoid this risk the dose should be tailed off gradually so as to give the patient's own adrenals an opportunity to resume normal function. Tailing off is probably the more necessary when cortisone is given orally, because with injected cortisone the depot effect provides for this to some degree.

Adult dosage of cortisone varies according to circumstances from 25 mg. to 200 mg. per day.

A.C.T.H., or adrenocorticotrophic hormone, is a highly purified protein fraction of the anterior pituitary lobe of cattle or other animals which has the unique power of stimulating the adrenal cortex to greatly increased activity, to hypertrophy, and to much augmented production of its

own hormones. It is stable in the dried state and is readily soluble in normal saline or water. Like most protein-type therapeutic substances, it is destroyed by the digestive juices of the stomach and small intestine, and so is inactive when taken by mouth. It must therefore be administered by parenteral injection, either intramuscularly or intravenously.

When A.C.T.H. enters muscle some of it is probably destroyed locally and some enters the blood stream to pass ultimately to the adrenal gland. Circulating A.C.T.H. is unstable and is fairly rapidly destroyed, probably within 15 minutes. It follows that when A.C.T.H. is injected intramuscularly only a small part becomes available for adrenal cortical stimulation: perhaps two-thirds or more of the total is destroyed either locally or in the blood stream. Not only this, but an injected dose is available for only a relatively short time, and adrenal stimulation probably starts to subside an hour or two after the injection. There are several methods for overcoming this difficulty. Injections may be repeated at frequent intervals; for this purpose, four times in the 24 hours is usually recommended. A given daily dose of A.C.T.H. produces considerably greater stimulation when given in divided doses over the day than when given as a single daily injection. A second method of producing more continuous stimulation is by a process analogous to that with zinc protamine insulin. A.C.T.H. can be incorporated in a gelatin base, and the resultant gel, which becomes fluid on gentle warming, is protected from rapid destruction after injection and is liberated slowly from the injection site over a number of hours. With this gel a single daily injection can provide continuous gentle stimulation of the adrenal over the greater part of the 24 hours. The third method is to administer the A.C.T.H., dissolved in saline, as a slow intravenous drip over a period of six to eight hours a day. A prompt response is obtained and the efficacy of a given dose is increased by 5 to 15 times, an important point where supplies are restricted. Though this is a very economical method of administration it clearly has several disadvantages. It is unsuitable except for patients confined to bed and in hospital; it needs constant supervision, is an encumbrance to the patient, and may occasionally lead to venous thrombosis. Although all three methods are still in use, the daily injection of A.C.T.H. gel is generally the method of choice.

Obviously A.C.T.H. will have no clinical effect if the adrenal cortex is diseased, as in Addison's disease, or if for any other reason it is unable to respond. Although in the great majority of patients the adrenal cortex is responsive, yet it is desirable to have some indication that this is so. It is most readily done by carrying out eosinophil counts; if a sufficient output of adrenal hormones has been achieved the eosinophil count will fall practically to zero. A check such as this is of considerable value during A.C.T.H. therapy, since in addition to adrenal unresponsiveness it occasionally happens that the sample of A.C.T.H. is either inactive or of low activity. In suitably equipped hospitals, observation of a rise in output of 17-ketosteroids or of so-called 11-oxysteroids is an additional check on the activity of the A.C.T.H.

When, after a course of injections to which the patient has responded, the A.C.T.H. is stopped abruptly, the hypertrophied and over-acting adrenal cortex is suddenly deprived of its stimulus. It is liable then to become inactive for a few days, and in this period, as with cortisone, adverse withdrawal phenomena may occur. The dose of A.C.T.H. should therefore be tailed off gradually to a low level before finally stopping treatment.

Contraindications to Therapy

Perhaps the most important single contraindication is ambiguity of diagnosis. Great harm may be done by giving these drugs to unsuitable patients. An improvement in well-being and indeed a euphoria, with fall in temperature and sedimentation rate and possibly some gain in weight, may easily give an entirely erroneous impression that the drug is doing good, thus diverting attention from the need

for treatment by more traditional and orthodox methods. Undiagnosed fevers and abdominal disorders of uncertain nature are examples where the drug should in general be avoided.

The second major contraindication is ignorance on the part of the physician of the physiological effects of the drugs. There are certain overdosage effects which should always be watched for, and these are considered below. They are all very real, and more harm than good may be done if any of them are allowed to develop too far unchecked.

In certain clinical states A.C.T.H. or cortisone should be given with special caution, and preferably only by those already experienced in its use and in the dangers of overdosage. Important among such relative contraindications are congestive heart failure with oedema, diabetes mellitus, and hypertension if it is already producing symptoms. Special caution is also necessary in any person who shows or has shown evidence of a psychopathic personality, as this can easily be made worse or a latent abnormality may become manifest.

Since A.C.T.H. is effective only by virtue of its stimulation of the adrenal cortex, it should not be expected to succeed in patients with seriously diseased adrenal glands, as in Addison's disease. Conversely, in states of adrenal hyperactivity, such as Cushing's syndrome, further stimulation with A.C.T.H. will only aggravate the disorder.

Particular caution is necessary in giving the drug to any person with active or latent tuberculosis, as there is considered to be danger of lighting up the activity.

Metabolic and Overdosage Effects

The same general metabolic effects are produced by both cortisone and A.C.T.H., but overdosage phenomena are rather commoner with A.C.T.H. because the response to a given dose of A.C.T.H. varies considerably from person to person. There is a mild but appreciable tendency to sodium and water retention during the first few days. Occasionally this may be sufficient to produce manifest oedema; in persons who are in any way sensitive to sodium retention, such as those with early congestive failure, signs of aggravation such as weight increase or rise in jugular venous pressure must be carefully watched for. If any adverse tendency is detected or even suspected, it will usually be wise to restrict the sodium intake, at least during the period of early therapy.

The drugs also cause a tendency to increased renal loss of potassium. In prolonged intensive therapy this may become sufficient to be of clinical importance. Muscular weakness and electrocardiographic changes may suggest an excessive potassium loss. Since potassium deficiency may be insidious in onset and difficult to detect, it is wise to ensure an adequate intake by supplementing the ordinary diet with 2 or 3 g. of potassium chloride. There may be also an increased calcium excretion in the urine. This is seldom of any clinical significance, but in patients with disturbed calcium metabolism, such as those with the steatorrhoea of non-tropical sprue, attacks of tetany have occasionally been provoked.

Carbohydrate metabolism is profoundly altered by these drugs. Sensitivity to insulin is decreased so that the blood sugar tends to rise, and in the established diabetic insulin requirements may be temporarily but very considerably increased. For this reason it is wise to be very cautious in administering the drugs to known diabetics. Their effect on blood sugar may be sufficiently great in non-diabetics to produce glycosuria. Such glycosuria is not, by itself, adequate reason for lowering or stopping dosage.

Adrenal cortical stimulation also usually involves the increased production of adrenal androgens. This may lead to mild evidence of masculinization in females, with a tendency to acne, amenorrhoea, or even hirsutism. These androgenic effects are usually negligible unless therapy with A.C.T.H. is intensive and prolonged. They are promptly reversed when treatment is stopped, and are not usually reasons for curtailing it.

SUPPLEMENTARY LIST OF APPROVED NAMES

The General Medical Council has authorized the following "approved names" selected by the British Pharmacopoeia Commission. The list supplements the consolidated list of names published in January and the supplementary list printed in the *Journal* of April 18 (p. 882).

Approved Name	Other Names
Bromazine	2 - (4 - Bromodiphenylmethoxy) - ethyldimethylamine. "Ambo-dryl."
Carbimazole	2 - Carbethoxythio - 1 - methylimidazole. "Neo-mercazole."
Cetomacrogol 1,000	Polyethylene glycol 1,000 monocetyl ether.
Chloropromazine	3 - Chloro - 10-(3-dimethylamino-propyl)-phenothiazine. "Larg-actil" is the hydrochloride.
Dextromethorphan	(+) - 3-Methoxy-N-methylmorphinan.
Dextrorphan	(+) - 3-Hydroxy-N-methylmorphinan.
Dihydrallazine	1 : 4 - Dihydrazinophthalazine. "Nepresol."
Dimenhydrinate	8-Chlorotheophylline salt of (2-diphenyl - methoxyethyl)dimethylamine. "Dramamine."
Hydrocortisone	17-Hydroxycorticosterone. "Hydrocortone."
Insulin zinc suspension	Insulin lente.
Insulin zinc suspension (amorphous)	Insulin semilente.
Insulin zinc suspension (crystalline)	Insulin ultralente.
Iproniazid	N - isoNicotinoyl - N' - isopropylhydrazine.
Isophane insulin	NPH insulin.
Levomethorphan	(-) - 3-Methoxy-N-methylmorphinan.
Levorphan	(-) - 3-Hydroxy-N-methylmorphinan. "Dromoran" is the tartrate.
Macrogol 4,000	Polyethylene glycol 4,000.
Macrogol 400	Polyethylene glycol 400.
Methoxamine	β - Hydroxy - 2 : 5-dimethoxy- α -methylphenethylamine. "Vasylax" is the hydrochloride.
Neomycin	An antibiotic produced by a strain of <i>Streptomyces fradiae</i> .
Noradrenaline	(-) - 2-Amino-1-(3:4-dihydroxyphenyl)ethanol. (-)-Noradrenaline. "Levophed."
Oxytetracycline	An antibiotic produced by <i>Streptomyces rimosus</i> . "Terramycin."
Phenylindanedione	2-Phenylindane-1:3-dione. "Dindevan."
Pholcodine	2'-Morpholinoethyl ether of morphine. "Ethnine."
Primidone	5-Ethylhexahydro-5-phenylpyrimidine-4:6-dione. "Mysoline."
Propantheline	2'-Diisopropylaminoethyl xanthen-9-carboxylate. "Pro-banthine" is the methobromide.
Racemethorphan	(±) - 3-Methoxy-N-methylmorphinan.
Racemorphan	(±) - 3-Hydroxy-N-methylmorphinan.
Salicylamide	<i>o</i> -Hydroxybenzamide.
Sodium antimonogluconate	Sodium salt of a trivalent antimony derivative of gluconic acid. "Triostam."
Stibamine glucoside	N-Glucosyl derivative of sodium <i>p</i> -aminophenylstibonate.
Thurfyl nicotine	Tetrahydrofurfuryl nicotine. "Trafuril."
Sodium Stibogluconate	Amendments Sodium salt of a quinquevalent antimony derivative of gluconic acid. "Pentostam."
Ethyl methimazole	This Approved Name is now replaced by Carbimazole (see above).

Less clearly related to the known effects on metabolism are the psychological changes. The improvement produced by the drugs in a susceptible disease such as rheumatoid arthritis is so marked that a dramatic increase in well-being and optimism is to be expected. Yet the mental stimulation and optimism, amounting to frank euphoria, often occur to a degree far in excess of what can be accounted for by such physical improvement. They appear largely to be direct effects of the drugs themselves and may occur even when the disease process has in no way been affected. Thus one scientist patient with advanced myeloid leukaemia was stimulated to plan many new scientific activities although no alleviation of his leukaemia occurred and he was dead within a week. In people of different make-up there may be depression rather than euphoria. This depression, together with insomnia, may become progressively more severe until frank psychotic tendencies become apparent. Though these mental changes are usually reversible, they should call for a careful review of therapy, and in general the dosage should be reduced.

[Part II will appear in our next issue.]

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

3-D AT CARDIFF

A three-dimensional surgical film in colour was shown at the Annual Meeting in Cardiff, presented by Ethicon Suture Laboratories. Entitled *Mediastinal Tumours*, it was made in Washington and was projected by special equipment lent from America. Each member of the audience was equipped with light polaroid spectacles, and there seemed to be few, if any, complaints of headache or visual discomfort. The film showed the surgical technique for the removal of such tumours in considerable detail, two operations being demonstrated, one for a thymoma by a left approach, the other for a cyst above the right diaphragm. The three-dimensional effect greatly enhanced the film's usefulness, especially as its subject lay within a body cavity. The relations of the various structures were immediately seen, and the highlights reflected from the moist organs were no longer the source of confusion they often were in two-dimensional films.

The film included a good spoken commentary, mostly descriptive of the steps being performed but interspersed with some general observations on the subject, such as the acceptable advice that all patients with mediastinal tumours should be subjected to exploratory thoracotomy, and that aneurysm can most reliably be excluded by angiocardio-graphy.

Advantages of Stereoscopic Effect

The film lasts about 40 minutes, and thus for most purposes is unnecessarily long. The experienced surgeon will learn little from it, for the operations are among the simplest performed within the thorax, and the ordinary doctor would probably have preferred more clinical or pathological facts and less technique. These are minor criticisms, applicable to a great many medical films. No doubt the film is directed especially at the trainee surgeon—a small group for whom it is ideal. Other audiences will probably be more interested in the film itself than in its subject. The stereoscopic effect is a definite advance, making the surgical technique notably easier to understand and visualize. This film, indeed, gives a clearer view than that obtained by most visitors to a crowded operating theatre, and others by the same process, perhaps showing more complex operations, or new ones, will be warmly welcomed—especially if condensed versions, omitting all but essential details, are available for showing to practising surgeons.

MEDICAL LIBRARIANSHIP

FIRST INTERNATIONAL CONGRESS

The first International Congress on Medical Librarianship was held in London from July 21 to 25, and was attended by delegates from over thirty countries as well as by representatives of international organizations. After an inaugural session there were symposia on the role of the medical librarian in the world, on education and training for medical librarianship, on the centralization of medical library resources, and on international co-operation in this field. Other events of the Congress included visits to the medical libraries of London and various exhibitions.

Sir CECIL WAKELEY, in a brief presidential address in the Beveridge Hall of the University, said that in his capacity as President of the Royal College of Surgeons he was closely concerned with one of the largest and most frequented medical libraries in London; as a medical editor he was vitally interested in medical bibliography and documentation; and as a practising surgeon he had long known that "some of the finest consultants available are to be found in medical libraries"—not only in the shape of the volumes on the shelves but of the librarians at the desks. Medical librarianship, he said, was a highly specialized subject and one admirably suited for an international congress. The medical librarian, who was not merely a librarian with some knowledge of medicine or a physician who was fond of books, was now taking his proper place in the world of scientific medicine and research. It was the ever-increasing complexity of modern medicine and the constantly growing bulk and variety of its literature which had given the medical librarian his place. The exhibition of medical periodicals of the world at the headquarters of the British Medical Association (*Journal*, July 25, p. 233) comprised some 2,500 journals, and he was told that there were 1,500 current medical periodicals which it had not been possible to include. For his own part he found this unique array of journals, in all languages and covering every department of medical knowledge, not only impressive but a little frightening.

Some thread by means of which they could find their way in and out of this labyrinth, Sir Cecil Wakeley continued, was provided by the Armed Forces Medical Library at Washington in its *Current List of Medical Literature*; but no single body could be expected to bear such an exclusive responsibility for long, and it was one of the objects of that Congress to hammer out ways of inter-library and international co-operation so as to spread the load. Perhaps a means might be found by which each country would be able to produce rapidly a current index to its own medical literature, and all the national indexes might then be assembled and reissued by one of the great international agencies such as the World Health Organization or Unesco.

In the Congress attention would be paid to the fundamental problem of the recruitment and training of the medical librarian. The curriculum which the librarian now had to pursue and the examinations which he must pass before he was entrusted with a medical library of any importance ensured that his specialty took a fitting place among the other specialties of medicine. The Congress, he said in conclusion, afforded a unique opportunity of serving the medical libraries of the world by planning for co-operation of the libraries on an international scale. The matters to be discussed demanded initiative and enthusiasm; this was no place for the academic formalities of a dead subject.

The vice-presidents of the Congress, who numbered 22 and represented 10 countries, were then presented to the president by Mr. W. R. LeFanu, the chairman of the Congress Committee, and each of them made a brief

response. The British vice-presidents included Sir Zachary Cope (who drew attention to a valuable library not mentioned in the programme, that of the Medical Society of London); Professor E. C. Dodds, Harveian Librarian, Royal College of Physicians; Sir Francis Fraser, Director of the British Postgraduate Medical Federation; Mr. Geoffrey Keynes, Honorary Librarian of the Royal College of Surgeons; Mr. H. J. Seddon, Honorary Librarian of the Royal Society of Medicine; Dr. J. W. Trevan, of the Wellcome Research Institution; Dr. A. L. Goodall, Honorary Librarian of the Royal Faculty in Glasgow, and Mrs. Lilian Lindsay, Honorary Librarian of the British Dental Association.



Medical periodicals from 68 countries on display in the Old Library, B.M.A. House.

The Armed Forces Medical Library

An exhibition to illustrate the services of the Armed Forces Medical Library at Washington was opened later on the same day at the Wellcome Research Institution. The American Ambassador in London was expected to perform the ceremony, but in his unavoidable absence this was done by Colonel EISSLER, of the Embassy, who said that in America they were very proud of the Armed Forces Medical Library. The Library was founded in 1836 and was now the largest collection in the Western Hemisphere and among the five or six largest medical libraries in the world. It was in 1868 that John Shaw Billings became the librarian, and he raised it from a collection of 5,000 volumes until, in 1895 when he left it, the volumes numbered over 100,000, and the great *Index-Catalogue*, which Dr. William Welch, of Johns Hopkins, once called the most important contribution Americans had made to medicine, was begun. Colonel Eissler said that the Americans felt that the Library was held in trust for the advance of medical science and for the use of all men in every country at work on the problems of disease. He was told that the catalogue was valued in Great Britain. Fifty-seven volumes had been published since its inception in 1880, and copies were deposited in many libraries and research institutions throughout the world. The services and resources of the Library, subject only to limitations of time, money, and personnel, were available internationally.

The exhibition was in the form of large panels illustrating the achievements and services of the library, the latter including photo-duplication, reference, translation, and research.

The final session of the congress was held on July 25, with Mr. R. Eriksson (Karolinska Institutet, Sweden) in the chair. Papers on international co-operation were read by Mr. E. Carter (Unesco) and by Mrs. Eileen Cunningham (Vanderbilt University, Nashville, Tennessee). These were followed by general discussion on the possibility of establishing an international medical library association. The following committee was appointed to ensure continuity of international co-operation among medical librarians and to prepare for

second congress after a suitable interval: Dr. J. Anker (Denmark), Mr. W. J. Bishop (U.K.), Dr. S. A. Chitale (India), Mrs. E. R. Cunningham (U.S.A.), Mr. R. Eriksson (Sweden), Dr. A. Hahn (France), Professor K. J. Hartmann (Germany), Dr. A. H. M. C. Kessen (Netherlands), and Mr. W. R. LeFanu (U.K.). Lieutenant-Colonel F. B. Rogers (Armed Forces Medical Library, Washington) expressed the appreciation of the delegates for the excellent organization of the congress and the hospitality accorded them while in London. It was announced that 315 delegates had registered from 32 countries and three international organizations.

SOCIAL MEDICINE CONGRESS IN VIENNA

[FROM A SPECIAL CORRESPONDENT]

An international congress of social medicine* was held in Vienna from May 23 to 25 under the presidency of Professor P. VERGA, director of the Institutes of Pathology and Cancer Research, University of Naples. The congress was attended by about 200 doctors. The three main themes were "Health and Living Conditions," "Effects of War on Physical and Mental Health," and "Medical Measures in the Face of these Problems."

On the first theme, Professor J. GILLMAN (Physiology Department, Witwatersrand University) said that complexes of nutritional and endocrine variations, rather than single factors, might influence the incidence of certain diseases and account for some of the differences between populations. As the diet of a population changed from inadequate to adequate, some diseases, such as pellagra, tuberculosis, and certain liver diseases, might be expected to decrease, and others, including diabetes, cardiovascular disease, and some forms of cancer, to increase. In addition to climate and geography, man determined to some extent his own and economic environment in which he lived. Dr. R. GIRARD (Guadeloupe) presented health statistics from the less developed parts of the French Union, and analysed the achievements and needs of their health services: for the ratio of doctors to inhabitants was 1:30,000 in Afrique Noire; 1:10,000 in Madagascar; 1:5,000 in Algeria; 1:4,000 in Guadeloupe; and 1:1,100 in Metropolitan France.

In the general discussion Dr. ALICE STEWART, Reader in Social Medicine, University of Oxford, summarized the work of her team upon the spread of tuberculosis in factories: this suggested that the risk to a given population was housed in large groups in spacious workrooms might be greater than when divided into small though overcrowded groups. Dr. P. D'ARCY HART, director of the Medical Research Council's Tuberculosis Research Unit, London, spoke on priorities in tuberculosis control and research. In countries with underdeveloped tuberculosis services, present chemotherapy had a much more limited use than in those with advanced technical resources and communications; prevention, particularly by improvements in living conditions, must continue to be the main weapon in control. Even in the more technically advanced countries the continued importance of social conditions in affecting tuberculosis levels should not be forgotten. Dr. Hart gave some examples of this continued relevance in Britain: in spite of sharp declines in tuberculosis rates, differences between better-off and poorer areas were still striking. Professor L. S. BOGOLEPOVA (Central Research Institute for Health Education, U.S.S.R. Ministry of Health) outlined current methods in her field. Much stress was laid on lectures to the public. Lecturers ranged from well-known physicians and medical scientists to final-year students, and the subjects from diet and practical hygiene to the history of medical discoveries and the lives of famous scientists. Similar lectures were given to convalescents and out-patients in hospitals. In addition to articles in the general press, a large volume of popular literature was produced. Organiza-

*Congrès Mondial des Médecins pour l'Etude des Conditions Actuelles de Vie.

tional responsibility lay with local "houses of health education," headed by the Ministry of Health's health education department; the Central Research Institute was responsible for improving educational techniques and for providing training for lecturers.

Effects of War

The opening paper on the second theme of the Congress was by Professor G. FRONTALI, director of the paediatric clinic, University of Rome, on "The Nutritional State of Children in Italy in the Post-war Period," as ascertained by a survey under the National Research Council. Social classes showed great differences in the quality and quantity of nutritional intake. In the higher classes the intake was close to the recommended figures, and was only slightly less in the peasant class. It was considerably lower in adequacy among the children of urban workers. There were also geographical differences, and it was remarkable that owing to poverty vitamin-C consumption was particularly deficient in the south (sufficient to produce haemorrhagic syndromes), even though this region contained the most important centres of production of citrus fruit.

The secretary of the Chinese Medical Association, Peking, Dr. SU CHING-KWAN, described national efforts to institute public health and education methods in China after a period of high rates of infectious diseases, high infant mortality, and malnutrition, exacerbated by long years of war. He described the "Patriotic Health Movement," which aimed at making the whole population actively interested in practical hygiene and living conditions, thus assisting the still very limited qualified personnel. Campaigns for the proper handling of food, for destruction of flies, mosquitoes, and vermin, and for raising the general standard of cleanliness had been highly encouraging. Drs. M. SHIOTSUKI, N. KUSANO, and S. YAMAMOTO (University of Tokyo) gave first-hand experience of the lesions caused by the atomic bomb explosions.

The main report on the third theme was given by Dr. B. WEILL-HALLÉ (Paris), who discussed the Hippocratic Oath and medical ethics in the world as it is. Apart from the meeting in 1949, which revised the 1929 Geneva Convention, a number of conferences had been held on this subject since the war. Among these was the meeting of l'Office International de Documentation de Médecine Militaire at Vichy in 1951, where the doctor's position in the face of the threat of bacteriological warfare was discussed. In 1950 the Medico-Judicial Commission of Monaco, discussing the relationship between the doctor and his country, attempted to differentiate the loyal duty which the citizen owes to his country from the obligations which his specific social function imposes on him. This Commission proposed an international convention for medical practice which, confirming the bans of the Geneva Convention, condemns the use of medicine for destructive purposes, and according to which the doctor retains the right to refuse his collaboration to acts contrary to his conscience. The speaker made a plea for doctors to examine their consciences when asked to undertake work other than the preservation of health and life.

Sir S. S. SOKHEY, of India, late deputy director of World Health Organization, urged that voluntary groups and associations should be set up to further the study of living conditions and health, particularly in countries whose public health services were not yet mature. This suggestion, as well as some of Dr. Weill-Hallé's proposals, was included in recommendations submitted to the closing plenary session of the Congress by its president. It was agreed that the improvements in health which could undoubtedly result from various improvements in living conditions were still inaccurately defined in all countries; that the second world war had brought to the fore new aspects of the consequences of war upon the health of populations; that doctors should again be reminded of their ethical obligations not only to their individual patients but to the community at large; and that to fulfil these obligations and promote health on a world basis, unimpeded exchange of ideas and therapeutic measures was required.

British Medical Association ANNUAL MEETING, CARDIFF, 1953 SUMMARY OF PROCEEDINGS

THE SECTIONS

SECTION OF PREVENTIVE MEDICINE

Wednesday, July 15

The Health Visitor and the Family Doctor

With the president, Dr. J. GREENWOOD WILSON (Cardiff), in the chair, Dr. LLYWELYN ROBERTS (Sheffield) opened a discussion on the health visitor and the family doctor. After giving a short historical review, Dr. Roberts stressed the importance of social as well as medical therapeutics. He felt that the health visitor was the key worker who should co-ordinate all the social agencies. It was still not yet fully appreciated by all doctors that health visitors were highly qualified nurses who, in addition to State registration, had taken at least the first part of the C.M.B. and had also obtained the health visitor's certificate. Health visitors could possibly assist the family doctor with the care of the mother and child, with problem families, with some psychological problems, with domestic emergencies due to ill-health, with the care of the aged in their own homes, with the care of the disabled, and with the care of the mentally deficient and the mentally sick. In many of these situations the health visitor could act as liaison officer between the doctor and whichever statutory or voluntary agency might best be able to give assistance. Dr. Roberts thought that there were far too many home visitors, and that the health visitor, by reason of her specialized training and experience together with her confidential position in the family, might well act as the channel for the economic employment of all the social agencies in any particular case. In order to achieve these aims there must be the closest relationship between family doctors and health visitors in exactly the same way as between general practitioners and district nurses and midwives.

Dr. STANLEY THOMAS (London) spoke as a family doctor of thirty years' experience. Among the important advances in medicine he had seen in his time he now counted the rapidly increasing liaison between general practitioners and the preventive medicine services. He referred to the paramount importance of the assistance of nurses in modern practice and instanced particularly the help received from the district nurse and midwife. He felt that there was similarly an essential need for the assistance of health visitors in unravelling the social problems of patients, particularly in connexion with young mothers and infant feeding, tuberculosis, mental illness, convalescence, problems of the aged, and juvenile delinquency. Doctors must first be convinced of the status and value of health visitors, and it was most important they should realize that she was first and foremost a hospital-trained nurse. In his opinion the health visitor was the key to liaison between the family doctor and the preventive medicine services.

The Cardiff Scheme

Dr. D. A. WILLIAMS (Cardiff) gave the point of view of a consultant physician with close personal experience of working with specialist health visitors. The scheme had started in Cardiff by the allocation of a health visitor to help in the aftercare of diabetic patients who had been admitted to Llandough Hospital. Owing to its success the scheme was extended by the attachment of other health visitors for patients with gastric disorders and with asthma. The health visitor was the ideal type of social worker—being a nurse of the status of ward sister who was also a social worker and an ideal liaison officer. She had a particular part to play in providing sound health education in the

home, where it was most needed and most likely to be heeded. The three diseases of diabetes, peptic ulceration, and asthma all provided home problems which were closely concerned with causation and treatment.

In the subsequent discussion Dr. H. D. CHALKE (London) described a modest scheme in his own area which had been successful in introducing individual health visitors to a number of general practitioners. He agreed that the health visitor should co-ordinate the work of other social workers, and he was particularly impressed by the part which the health visitor could play in the domiciliary care of old people.

Dr. M. L. H. EVANS (Lewisham) expressed the opinion that much antagonism could be broken down by regular meetings between general practitioner and health visitor. If the health visitor could come to such a meeting primed with details of problems presented by some of the doctor's cases, then her value would be likely to be more apparent. Dr. W. E. THOMAS (Glamorgan) spoke of the problems of county councils with large distances to cover. He thought liaison between doctors and health visitors had improved considerably. There was a national shortage of health visitors and it was difficult to make additions to the staff. Dr. MARY ESSLEMONT (Aberdeen), as a general practitioner with previous local authority experience, made a strong plea for direct contact between doctor and health visitor, preferably by telephone. Dr. W. B. QUISENBERRY (Hawaii) also spoke from a background of experience of both general practice and public health. He thought that health nurses were so versatile that doctors might be inclined to expect too much from them. They played an important part in the care of the chronic sick, and the speaker had found them of great value in his scheme for cancer control. In incipient mental illness they could do much good.

Dr. S. S. B. GILDER (World Health Organization, Geneva) thought that health education was the particular sphere of the public health nurse. More and more the importance of sociology in medicine was being recognized, and in certain circumstances, such as in a very backward area, a public health nurse might be able to achieve as much success as a medical officer.

Dr. A. TALBOT ROGERS (Bromley) said that a number of recent inquiries had all revealed a lack of understanding between general practitioners and health visitors. They must get together and realize their common problems. He was critical of too much specializing among health visitors. The all-purpose health visitor was the best person to assist the family doctor. The health visitor should work with the family doctor rather than for him, and he deprecated the argument often put forward that general practitioners were too busy to cope with social problems.

Dr. W. M. FORD-ROBERTSON (Beirut) wondered whether either the family doctor or the health nurse was adequately trained in the psychosomatic aspects of general practice.

CANCER AND THE COMMUNITY

The meeting of the Section continued in the afternoon with a discussion on cancer and the community. Dr. PERCY STOCKS (Rhos-on-Sea) was unable to be present, and his opening paper was read by the president, Dr. J. GREENWOOD WILSON (Cardiff). Dr. Stocks felt that the attitude of the general public to the cancer problem differed from that of the medical profession. The former looked towards prevention while doctors were at the moment more concerned with improvements in treatment. It was time to bring the cancer problem fairly and squarely into the field of preventive medicine. As measured by the estimated loss of working life, cancer deaths were now of greater economic importance than fatalities from respiratory tuberculosis or accidents. The finding of statistical relationships between cancer incidence and environmental factors ought to lead to action now, and not be shelved to await a full understanding of cancer aetiology—which may be long delayed. Researches arising out of such statistical evidence were already proving fruitful in cancer of the lung and stomach.

Medical officers of health could give effective assistance in environmental field studies on these and other forms of cancer. For instance, why was cancer of the stomach commoner in certain large cities and in some rural areas of North Wales? The public should be informed of the statistical evidence implicating environmental factors such as smoking, so that each individual could decide for himself what it amounts to. The responsibility of the medical officer of health for health education should include cancer education.

A Programme for the Control of Cancer

Mr. RONALD W. RAVEN (London), in his opening remarks, pointed out the world-wide challenge of cancer. He gave details of recent national variations in growths of different sites, and dealt briefly with the family and individual problems that can arise as a result of cancer.

Mr. Raven then outlined a five-point programme for the control of cancer. (1) *Research into causation.* Clinicians and laboratory workers must co-operate, and more field research might yield important results. (2) *Prevention.* Cigarette-smoking and atmospheric pollution possibly had something to do with lung cancer, and here there was a place for preventive work, as there was in industry in connexion with carcinogenic mineral oils and tar. Surgery also had a place in the removal of pre-cancerous conditions. (3) *Early diagnosis and treatment.* Cancer is at first always a local disease, and the aim should be to diagnose it before spread has taken place. Progress has been made in treatment by surgery, radiotherapy, and chemotherapy. (4) *Rehabilitation and after-treatment.* There was a need for special convalescent homes for patients who had been treated for cancer. (5) *Care of patients with advanced disease.* This was a big problem at present. Much could be done to relieve pain, and above all else despondency must be averted.

Mr. Raven emphasized that the community had certain responsibilities in such a programme, chiefly in the direction of prevention and early diagnosis. The public must be advised how they can play their full part, and cancer education was therefore necessary. There should be an education plan on a national basis with the object of substituting intelligence and optimism in the place of ignorance and fear. To achieve this the speaker looked to medical officers of health, acting through local cancer education committees. The medical officer of health would be greatly assisted by his field workers, such as the district nurses, health visitors, and midwives. Medical students and student nurses should receive full education in early symptomatology. The methods of teaching would include leaflets, articles in the press, lectures, films, and the use of wireless and television. A very useful series of 12 leaflets had been produced by the Marie Curie Memorial Foundation which gave simple facts about cancer in general and essential information about cancer of certain special sites.

Dr. E. K. MACDONALD (Leicester) said that the size of the cancer problem could be stated in graphic terms by equating the number of sufferers in England and Wales at any one time to the total population of a town the size of Blackpool or Southend-on-Sea. The total number of new cases each year was equivalent to the population of a city like Oxford, while the total cancer deaths each year were equivalent to the complete wiping out of a town the size of Doncaster or Southport. Although some cases were asymptomatic until too far advanced for remedial treatment, and in others the rate of growth was too rapid, nevertheless it was true that many patients had symptoms present for a considerable time before medical advice was sought. It was to such patients that cancer education should be directed. It has been calculated that if all the cases were diagnosed and treated by the best known methods the chances of survival would be more than doubled.

It was the duty of the local health authorities under Section 28 of the National Health Service Act to carry out any type of health education that might better the health of the people. Something was being done towards

cancer education in some areas, but this was not enough. In order to achieve success co-operation was necessary between the medical profession, the health department, and the public. Dr. Macdonald hoped that all those attending the meeting would return to their own areas and see if something more could not be done in the way of cancer education. The Central Council for Health Education would be delighted to help if asked.

Cancer Prevention in Hawaii

In the discussion, Dr. W. B. QUISENBERRY (Hawaii) gave an account of the cancer problem in his own country and how it was being tackled. He showed some interesting slides to emphasize the points he made. The problem in Hawaii had increased as the population had aged, and cancer was now the second commonest cause of death. The stomach was the commonest site of cancer, and there were interesting differences in incidence between the Japanese and Caucasian population. The policy of making every private physician a cancer-detection officer had been adopted. Their cancer education programme had been directed towards getting every citizen to have regular physical examinations, preferably every six months, as well as to report to his doctor any signs which might mean cancer. Pathological material could be sent in to a central laboratory without charge, and material from 11,647 patients had given 112 positive results, including 24 specimens taken from patients with uterine cancer who had been asymptomatic but who had been to a cancer-detection clinic. Dr. Quisenberry concluded that cancer prevention was a field which needed far more attention than it had yet received.

The PRESIDENT, in drawing the discussion to a close, said that at the moment there was a divided medical profession in this country on this point, and it was not easy for the medical officer of health to achieve any success with a cancer education programme unless he had the backing of the local doctors.

SECTION OF DISEASES OF THE CHEST

Friday, July 17

Artificial Pneumothorax in Pulmonary Tuberculosis

With the president, Sir CLEMENT PRICE THOMAS (London), in the chair, Dr. HOWARD NICHOLSON (London) opened the discussion. The continual changes in methods of treatment had made it difficult to assess the value of artificial pneumothorax in pulmonary tuberculosis. Nowadays it was necessary to gauge the effects of pneumothorax in conjunction with chemotherapy and to contrast the results with those of pulmonary resection. It was too early to reach definite conclusions. Nevertheless, the conditions in which it was safe to start pneumothorax were well known. It should not be considered in cases with acute spread or pneumonic consolidation, or when there was active bronchial tuberculosis of the lobar or segmental bronchi. Pneumothorax therapy was still indicated when cavities persisted after streptomycin treatment, when there were scattered foci of infection, and when the disease was progressive in spite of adequate conservative treatment. Pneumothorax had no place in treating disease of the nodular type or tuberculomata.

Dr. C. H. C. TOUSSAINT (London) considered that it was now time to review the value of artificial pneumothorax in the light of the widespread use of antibiotics. It was salutary to recall the time-honoured view that artificial pneumothorax should always be an adjunct to general treatment. Since the advent of antibiotics he had remodelled his opinions on the manner in which artificial pneumothorax should be used. It was best to secure cavity closure before inducing a pneumothorax, which could then be safely used as a method of treatment during the patient's rehabilitation. When used in this way it was not necessary to maintain artificial pneumothorax for prolonged periods.

Mr. R. S. BARCLAY (Newton Mearns, Renfrewshire) thought that pneumothorax would be less used in the future as a method of treatment. Serious complications had always been a drawback to pneumothorax therapy, but results of treatment were often so good that its efficacy should not be underrated. Most complications could be avoided by simultaneous antibiotic treatment. The aims of pneumothorax treatment were relaxation of the lung and cavity closure. Endobronchial disease was a contraindication and should diligently be sought by bronchoscopy and bronchography. Preliminary rest and antibiotics should always be used so that progress could be assessed and future treatment planned. There should be no hesitation in abandoning an ineffective pneumothorax. The alternative treatment by combining antibiotics and surgical resection should always be considered as the best method of getting the patient back to health as quickly as possible.

Dr. C. S. DARKE (Sheffield) said that pneumothorax treatment should aim at restoring full health while incurring least risk of impairing respiratory function. The optimal period for maintaining a pneumothorax was not known. Some physicians had thought that three years was sufficient, whereas others had maintained treatment almost indefinitely. There was always a risk of disabling and dangerous complications developing while a pneumothorax was present. The policy should be to terminate the pneumothorax deliberately as soon as the disease was arrested. The length of time could be greatly reduced by using chemotherapy and postural retension. A pneumothorax which had given adequate pulmonary relaxation could often be abandoned safely after eighteen months or two years.

Dr. PETER W. EDWARDS (Cheshire Joint Sanatorium) thought that one drawback to prolonged early treatment was that it might prejudice the subsequent induction of a pneumothorax. In one series of patients it had been impossible to induce a pneumothorax in one-quarter of the cases after a period of bed rest. Although rest was essential it should be combined with an early pneumothorax when this was indicated. There was also a danger in embarking too hastily on a course of antibiotic treatment. During the initial rest period pneumothorax could safely be started as soon as the temperature and sedimentation rate began to fall. The correct period for maintaining a pneumothorax was about three years. In cases observed for a period of ten years it had been shown that phrenic crush treatment was of great value when combined with pneumothorax, or used alone when pneumothorax induction had proved impossible.

In the discussion which followed, Dr. V. COTTON-CORNWALL (Liverpool) thought that it was too early to decide whether a shortened period of pneumothorax treatment was of lasting benefit to the patient. In reply to Dr. W. S. HAINES (Mombasa), Dr. TOUSSAINT said it was not always necessary to do thoracoscopy in all pneumothorax patients, but Dr. EDWARDS preferred to do routine thoracoscopy.

Constrictive Pericarditis

Professor FREDERICK R. G. HEAF (Cardiff) took the chair when three short papers were read. Mr. O. S. TUBBS (London) gave an account of constrictive pericarditis. In this disease the heart became encased in a thick inelastic fibrous coat which prevented it from expanding and contracting properly. Calcification of the pericardium commonly occurred, but was not an essential feature. Almost all cases had a tuberculous origin. The clinical picture was that of congestive heart failure in the absence of any readily demonstrable cause. Although peripheral venous congestion predominated, breathlessness from pulmonary congestion was often present. The heart remained small, the apex beat did not shift on changing posture, and cardiac irregularities were common. Radiography showed diminished cardiac pulsation and sometimes pericardial calcification. Excision of the pericardium was required when symptoms persisted after simple treatment. A coloured film was shown to demonstrate the appearances of the heart at operation.

Congenital Atresia of the Oesophagus

Mr. R. H. FRANKLIN (London) said that atresia of the oesophagus, although a rare congenital abnormality, was about as common as hare-lip. Five anatomical varieties had been described, but only two were common. Early diagnosis was not difficult if the possibility of the disease was remembered. Affected babies went blue soon after birth and the blueness returned after pharyngeal suction. Diagnosis could be confirmed by passing a soft rubber catheter to the point of obstruction. Radiographical confirmation could be obtained by introducing 0.5 ml. of iodized oil through the catheter. This should only be done under direct observation when the possibility of surgical treatment had been considered. Radical surgical repair gave most satisfactory results.

Radiological Diagnosis of Pneumoconiosis

Dr. ARCHIBALD L. COCHRANE (Cardiff) described a method of analysing the radiological changes in pneumoconiosis. This system had formed the basis of an international classification. Pneumoconiosis was described as "simple" when the radiological shadows were diffuse and as "complicated" when massive fibrosis was seen. Both forms were divided into four grades according to severity. The figures 1 to 4 denoted the severity in the simple form, and the letters A to D in the complicated form. Standard films representing the minimal changes in each category were available. The respiratory disability and the prognosis could be accurately predicted from the radiological appearances alone.

Mr. E. F. CHIN (Southampton), Mr. J. H. PIERRE (Trinidad), and Dr. A. CAPLAN (Penarth, Glam) took part in the discussion which followed these papers.

SECTION OF NEUROLOGY

Friday, July 17

Diagnosis and Treatment of Meningitis

With the president, Dr. W. RITCHIE RUSSELL (Oxford), in the chair, four papers were read. Dr. HONOR M. V. SMITH (Oxford) pointed out that since modern therapy had provided potent remedies, often specific for certain organisms, the need for early and accurate differential diagnosis in meningitis had become urgent. She emphasized that the early institution of appropriate chemotherapy, with access of the remedy in adequate concentration to all sites of infection, was essential. Recognition of the causal organism was necessary, and it was largely early recognition and treatment that had reduced mortality, which remained high despite specific remedies whenever the start of treatment was delayed. The sulphonamides were effective in meningococcal infection, but pneumococcal meningitis, a most fulminating disease, required penicillin by intramuscular and intrathecal injections: the latter route was safe in a dosage of 10,000 to 20,000 units for adults. Streptomycin gave good results with influenzal and coliform organisms and was essential, with or without isoniazid, for tuberculous meningitis. The onset of this disease was insidious, and the family doctor should consider this diagnosis whenever unexplained malaise, irritability, headache, and fever persisted for five to six days in a child or young adult. Dr. Smith outlined a scheme for reducing delay in the start of treatment—urgent admission to hospital of any patient with suspected meningitis, with a preliminary covering dose of sulphonamides and penicillin, and intramuscular injection of barbiturates to guard against epilepsy (a common hazard in purulent meningitis, especially in children, when it had a very adverse effect on prognosis).

Dr. W. HENDERSON (York) raised the problem of recurrent pneumococcal meningitis. Dr. C. PALLIS (Cardiff) asked if preliminary penicillin might not obscure the results of examining the C.S.F. for organisms. Dr. MARGARET EGAN (Manchester) suggested that isoniazid might also have a

special place in tuberculous meningitis. Mr. MURRAY A. FALCONER (London) asked for the incidence of deafness with streptomycin treatment, which Dr. SMITH said was 10%.

Dangers of Bulbar Poliomyelitis

Dr. A. B. KINNIER WILSON (Oxford) said that this form of poliomyelitis was responsible for the great majority of deaths. Severe involvement of respiratory or vasomotor centres was a rare direct cause of death. More commonly defects in swallowing caused inhalation of saliva or food; or respiratory failure came from concomitant involvement of bulbar centres and respiratory muscles. A clear airway was an urgent need, and simple tilting of the patient in the prone position would usually secure this, though additional suction was at times required. Defects of swallowing were often gradual, and vomiting was not usually thought of as due to bulbar irritation. Nevertheless early recognition was important, because with slow seepage of secretions into the lungs and consequent reduced aeration—not of themselves dramatic—a sudden choking attack might be fatal. A stethoscope over the larynx might detect early swallowing difficulty, and a throat microphone which could be left in position and recorded sounds into a loudspeaker allowed respiratory or swallowing defects to be heard at once throughout the ward. The speaker criticized the widespread use of tracheotomy with controlled respiration via an anaesthetic bag, as used in the recent Copenhagen epidemic. It was unnecessary unless respiratory muscles were also involved. It deprived a very ill patient of the comfort of speech, and later closure of the tracheotomy might be difficult. Dr. Kinrier Wilson concluded by demonstrating on himself the sound of normal breathing and swallowing with a throat microphone.

Dr. W. W. MAPLESON, a physicist from the anaesthetic department at Cardiff, described a two-way valve for use with the Oxford inflator, electrically driven, in place of manual inflation. Dr. A. FULLERTON (Batley) was told in reply to a question that recent tonsillectomy seemed to increase the incidence of the bulbar form of poliomyelitis, but it was not clear that the overall incidence of the disease was thus increased.

Surgical Treatment of Intracranial Haemorrhage

Mr. RICHARD T. JOHNSON (Manchester) said that cerebral haemorrhage in generalized arterial disease had as yet no surgical treatment. This had a growing place, however, in leakage from an aneurysm or angioma, which might present as a space-occupying lesion from slow bleeding with clot formation, or more commonly as frank subarachnoid haemorrhage. In investigating the latter, he thought angiography was always desirable, but might be dangerous in unskilled hands. When to transfer an ill patient to a special centre was a problem. Soon after the haemorrhage angiography might worsen the condition and arterial spasm obscure an aneurysm. Patients seen later were better surgical risks because they were selected. However, Mr. Johnson said that when he did see the patients early he used angiography in the hope of defining the problem for later surgery. Treatment of a clot by evacuation was often very successful, though gradual evacuation might be needed if intracranial tension was high in order to avoid reactionary bleeding at the edges of the cavity. For an angioma full excision was best, if possible; clipping of vessels feeding it had been disappointing. Aneurysms could sometimes be approached directly, and hypotensive drugs had been a definite help. Clear angiographic demonstration was essential, and temporary occlusion of the opposite carotid allowed better concentration of the contrast medium. If direct approach was not practicable there was no doubt of the value of carotid ligation. Steady progress was being made in this field of surgery, and figures from the Manchester department of neurosurgery for the last 18 months supported this.

Dr. T. ROWLAND HILL (London) pleaded for a more experimental approach in the apparently hopeless case,

and asked what the exact cause of death was. He felt carotid ligation as an emergency measure even without neurosurgical help was justified at times.

New Trends in the Diagnosis of Spastic Paraplegia

Mr. MURRAY A. FALCONER (London) mentioned the frequency with which intervertebral disk degeneration caused pressure on nerve roots or cord. The mechanism could be by herniation of the disk backwards, by rupture of the annulus fibrosus with extrusion of a part of the nucleus, or by atrophy of the whole disk with secondary changes in vertebrae such as the formation of osteophytes or spurs. The second mechanism produced a picture of spinal block, with manometric changes and raised C.S.F. protein. Myelograms aided the diagnosis, and surgical removal of the soft-tissue protrusion was best. The third mechanism caused a very slowly progressive paraplegia, and straight radiographs as well as myelograms were helpful in diagnosis. Treatment was first by immobilization, but if operation was needed it was best to do a laminectomy and cut the dentate ligament to free the cord from pressure against the bony ridges present. Attempts at removing these had caused further cord damage. This syndrome was common in the cervical region, though it could occur also in the dorsal spine, and the picture of "cervical spondylosis" was becoming more frequently recognized. The neurological signs were patchy, rather than giving a picture of a transverse cord lesion, and the detailed pathology of the condition was still a matter of argument. However, intermittent trauma, in which traction played a part, was certain, and the speaker thought that compression of the anterior spinal artery might also be concerned in the aetiology.

Dr. J. D. SPILLANE (Cardiff) suggested that correlation of the x-ray changes with the presence or absence of signs and symptoms was required. Both he and Professor P. C. P. CLOAKE (Birmingham), who emphasized the value of immobilization in a collar, suggested that pressure arising in the way described was the commonest cause of insidious paraplegia in the elderly—a view with which the chairman agreed.

SECTION OF OCCUPATIONAL HEALTH

Friday, July 17

Symposium on Work and Age

With the president, Dr. J. A. L. VAUGHAN JONES (Leeds), in the chair, Dr. W. P. D. LOGAN (London) introduced a symposium on work and age. He described how over the past 80 years or so birth rates and death rates had been falling in this country, thereby materially changing the age distribution of the population. At present there were two people of working age (15 to 64 years) for every one person outside this age range, whether younger or older. This ratio was now higher than it had ever been, but it would decline still further during the next few decades. This meant that a relatively greater number of children and old people would become dependent on a decreasing population of people of working age. At the same time the proportion of old people in the population would continue to increase and by 1991 would be almost as great as the proportion of children.

Age of Retirement

The 1% sample results of the 1951 census had provided some up-to-date information about the numbers of elderly people who were retired or still working. At ages 60 to 64 years 10% of men were retired, but by the age of 70 years this figure had increased to 70%. Employers, managers, and men working on their own account carried on working to a higher age than the largest group—namely, those classified as operatives. The nature of the occupation also had an influence on the time of retirement. Whereas among agricultural workers aged 70 years and over only 59% were retired, the corresponding figures for

rail transport workers and fishermen were 96 and 94% respectively. The figure for miners and quarrymen was 92%, and for all men aged 70 years and over 77%.

The survey of sickness carried out by the Central Office of Information had shown that in an average month of 1950 days of incapacity for work per month averaged 0.69 per man aged 16 to 34 years, and increased steadily to 1.61 at ages 55 to 64 years, after which no further increase was recorded. The significant inference is that time lost on account of sickness does not suddenly rise steeply at a certain age (for example, the present arbitrary age of retirement, 65 years), but probably increases gradually throughout at least the latter half of adult life. Dr. Logan said that in his opinion there was no justification for retiring people at a specified age. Elderly people, however, must be relieved of work load, and efforts to this end should often be applied under the age of 60 years and not deferred until evidence of breakdown occurred.

Sickness in Post Office Workers

Dr. D. D. REID (London) amplified this aspect of the problem. He based his remarks on an intensive epidemiological survey of sickness, retirement on account of invalidity, and premature deaths which had been carried out over a period of four years among the staff of the General Post Office—one of the largest employers of labour in Great Britain. Sickness absence rates among young women were as a rule worse than those of the equivalent group of male workers. However, the rates among women in their fifties compared favourably with those of men of the same age. While older men were less often absent than young male staff, the average duration of absence and the total number of days lost per person were greater. To some extent these differences were attributable to differing patterns of sickness in the separate age groups. Whereas the common cold—a disease of short duration—was frequent in the younger age groups, chronic bronchitis—a cause of prolonged and recurring sickness absence—chiefly affected men over the age of 45 years. Premature "invaliding out" was mainly occasioned by chronic bronchitis, degenerative heart disease and atherosclerosis, and arthritis and rheumatism—all disorders which adversely affect physical rather than mental capacity for work. Outdoor staff were more often and more seriously affected than indoor staff. Dr. Reid concluded that the urgent need was for job modification to lighten the physical load on the older workers.

The Elderly Skilled Worker

Against this background the Rev. A. T. WELFORD (Cambridge), speaking as a research psychologist, summarized the work which he and his colleagues at Cambridge had been conducting into some fundamental problems in this field. The aim of research into this problem in industry should be to find ways of avoiding the drift of older people into light unskilled jobs. So far as possible they should be assisted to continue in the work in which they were skilled, without according them any special consideration. Towards this end the most promising approach seemed to lie in the modification of the demands made by the sort of work which had been shown to be unfavourable to older people. This could be done by improving machines and work design. Recent investigations, both in the laboratory and in industry, had suggested a number of ways in which such adjustments might be made. It had been established that with increase of age the average level of performance or activity tended to fall and the scatter round that average tended to increase.

However successful the policy of adapting work to the capacity of older people might be, there would nevertheless always be some who would have to change their jobs in middle age. This involved the training of older people, a problem about which adequate knowledge and experience are yet lacking. Current research seemed to show that difficulty in acquiring a new skill might often lie in the actual training rather than in the learning process. Finally he advocated an aggressive attitude by industrial medical

officers to influence the design of machine tools and in securing better and more timely training of ageing workmen.

In the final paper Dr. I. M. RICHARDSON (Aberdeen) gave an account of an investigation which he had made into the effects of ageing on working capacity among foundry workers and coal-miners. If the problems of age and work were to be solved it was necessary first to study individuals, then from those studies to formulate the appropriate average policy, and, thirdly, to go back to the individual and decide how best to apply that policy to him. In his experience the average age at which demands for relief from heavy work occurred was somewhere in the middle fifties. He acknowledged that the term light work had been adversely criticized, but he felt it must be retained because it had a definite meaning to the worker. What was really important was not the title but the meaning. For the workman, light, or more accurately lighter, work meant work in which the pace was slower and in particular was under the individual's own control. Whenever feasible this need should be met without a change of job. When this was not practicable the alternative job should permit the opportunity for the exercise of existing skills.

A lively discussion followed, and all the speakers commended the quality of the papers and stressed the vital importance of the subject. Dr. H. R. FREDERICK (Port Talbot) spoke about the problem as it affected South Wales, particularly the tinplate workers. Dr. G. J. ROBERTS (Cardiff) wondered whether the desire of the skilled workman for a change of job represented opposition to modern mass-production methods, including breakdown of jobs and processes. Dr. W. B. QUISENBERRY (Hawaii) raised the question of accident proneness in older workers and the place of sheltered workshops for their employment. Professor R. C. BROWNE (Newcastle-upon-Tyne) asserted that it was the duty of medical teachers constantly to convince their pupils that the prescription of work should be as precise and detailed as the prescription of medicaments. Dr. J. MCG. ROGAN (London) made the important point that the workman himself often realized his diminishing powers and solved his own problem by finding suitable alternative work. This signified that those concerned in this problem should beware of being too "grandmotherly" in their efforts on behalf of every workman.

Occupational Cancer

Dr. J. GWYNNE MORGAN (Clydach) contributed an occasional paper on a series of cases of occupational cancer of the nose (44 cases) and cancer of the lung (110 cases). These had been observed over the last 40 years among workmen engaged in nickel refining. Some of the processes were very dusty and some of the materials contained arsenic as an impurity. Intensive efforts had been made through mechanization, reduction of dustiness, and the use of arsenic-free sulphuric acid to control the hazard. While sporadic cases continued to appear, none has so far occurred among men who had commenced work on the plant during the past 25 years. A noteworthy feature was that not infrequently the disease had not become manifest until several years after the workman had ceased work in the processes.

Dr. Morgan also described and demonstrated a simple test for detecting coproporphyrin in the urine of lead workers.

SECTION OF OPHTHALMOLOGY

Friday, July 17

Ocular Complications of Diabetes

With the president, Mr. J. H. DOGGART (London), in the chair, papers on the ocular complications of diabetes were read by Mr. G. I. SCOTT (Edinburgh) and Dr. LEONARD H. HOWELLS (Cardiff). Mr. SCOTT emphasized that there was now no doubt that diabetic retinopathy was an entity quite distinct from that occurring as a result of hypertension or atherosclerosis. Even in the older patients in his

series of 150 diabetics retinopathy was equally common in patients with or without hypertension. He also noted that the incidence of retinopathy increased very markedly with the duration of the diabetes, although he stated that some 10% of cases showed retinopathy within a year of the condition being diagnosed. In diabetics of twenty years' standing or more the incidence was over 70%. The speaker then described recent pathological work and findings in the retina, and gave a classification of the clinical stages. In the first stage capillary micro-aneurysms were a prominent feature. These were followed first by punctate and later by blot haemorrhages. Subsequently either retinal haemorrhages might progress and exudates develop or there might be haemorrhages into the vitreous followed by retinitis proliferans, proceeding to detachment of the retina and degeneration of the eye. In another smaller group of cases the initial fundus changes consisted in retinal periphlebitis, following which vitreous haemorrhages and retinitis proliferans also occurred. The total incidence of retinitis proliferans in all cases of diabetic retinopathy varied between 9 and 16%. There was some evidence to suggest in Mr. Scott's cases that careful control of the diabetes reduced the incidence of retinopathy, probably through an effect on capillary fragility. He had found rutin to be of no value. Other changes briefly discussed were alterations in the refraction of the eyes, the development of true diabetic cataract in young persons, and the effect of diabetes on the incidence and development of senile cataract.

Dr. HOWELLS began by saying that diabetes was becoming more common and that in this country some 3% of the population suffered from the disease. He stated that there was an undoubted hereditary transmission, and that treatment of the disease, in that it not only increased fertility but made childbirth safer, was bound to lead to increased numbers of surviving patients suffering from the disease. The disease was much commoner in overweight patients, at any rate in the older age groups. With the increasing longevity of diabetics due to modern therapy ocular complications became more common, and some 30% of all diabetics eventually developed retinopathy. He agreed that the incidence was 70% or more in old age, and had observed that in many of the older patients hypertension and renal changes were added to the ocular complications. In treatment he considered it essential in the older overweight patients to reduce weight, preferably by dieting. If this were successful the condition could be adequately controlled clinically without insulin in many patients. It was preferable to reduce weight by diet only, but if this were unsuccessful then there should be no hesitation in using dextro-amphetamine sulphate. In younger patients a diet should be prescribed which would enable them first to regain and then to maintain the standard weight for the patient's age. In a smaller series of patients than that analysed by Mr. Scott he found the incidence of retinopathy varied little according to the duration of the disease, and that it occurred at least as frequently in well-controlled as in partially controlled diabetics.

Mr. A. B. NUTT (Sheffield) considered the problems of cataract operation in diabetes. In his view, the eyes in these patients should not be considered normal and were more liable to complications; convalescence was often stormy. Among the complications he described were delayed wound healing, infection, haemorrhage, and post-operative iridocyclitis.

In the general discussion Dr. HOWELLS stated in reply to Mr. T. S.-B. KELLY (Hereford) that the renal threshold in diabetes was probably higher than is generally realized, and in reply to Mr. J. E. M. AYOUB (London) that although much work had been done there was no knowledge of any other metabolic factor which might be responsible for retinopathy. In reply to Dr. T. A. S. BOYD (Oxford) he said that at present no clinical differentiation in man should be made between diabetes resulting from insulin deficiency and pituitary dysfunction. Mr. NUTT, in reply to Dr. G. J. ROMANES (East Grinstead) said that the use of the methonium compounds during operation, with the idea

of controlling haemorrhage, was probably dangerous in these cases, but suggested that toluidine blue might prove to be of value.

The President of the Association, Mr. J. W. TUDOR THOMAS, attended some part of the meeting, and welcomed members of the Section.

Corneal Grafting

In the second discussion on the scope of corneal grafting, with one of the vice-presidents, Mr. RUPERT J. PARRY (Cardiff) in the chair, the openers were Mr. B. W. RYCROFT (London) and Mr. E. C. ZORAB (Southampton). After a brief historical review of the past 150 years Mr. RYCROFT spoke about the factors which at present influenced the expansion of corneal-graft surgery. Under the heading of "Technique" he considered the fixation of the graft, the type of section, and the problem of total transplantation of the cornea. He also entered briefly into the problems of administration, touching on eye banks, the preservation of graft material, and the training of surgical teams engaged in this type of work.

The major problems of corneal-graft surgery at the present time were in oedema and neovascularization of the cornea, both of which were possible results of an antibody-antigen reaction the precise nature of which was still not determined in spite of much experimental work. In the speaker's view this reaction was the most important problem in corneal-graft surgery to be elucidated.

Mr. ZORAB dealt with the difficulties met with by the surgeon who was relatively inexperienced in this type of work, emphasizing that he must be eclectic in his decisions on choice of case, on when to operate, and that he should start with lamellar grafts in difficult cases. Technical accuracy in this work was extremely important. He made a plea for research into methods of accurate measurement of the corneal thickness, and into the possibility of developing a satisfactory mechanical trephine. He also discussed from his own experience the pitfalls and poor results occurring from errors of technique.

Mr. J. AYOUB (London) also discussed various complications which may follow the operation, particularly prolapse of the graft, post-operative glaucoma, the development of anterior synechiae, and the occurrence of oedema and vascularization of the grafts. He thought that some post-operative complications were probably due to allergy.

Mr. A. G. LEIGH (London) analysed the various factors resulting in post-operative opacification of the graft, dividing these into three groups: incorrect choice of case, faulty operative technique and post-operative treatment, and delayed opacification of the graft due to the formation of fibrous tissue on its posterior surface resulting from causes so far unknown.

In the general discussion, in reply to Mr. A. G. PALIN (Bristol), Mr. RYCROFT stated that he could offer no explanation for the clearing of the cornea which took place in some cases after a delimiting keratotomy.

SECTION OF ORTHOPAEDICS

Friday, July 17

The Injured Hand

With the president, Mr. A. O. PARKER (Cardiff), in the chair, Mr. W. GISSANE (Birmingham) opened a symposium on the injured hand, later acclaimed by several experienced orthopaedic surgeons as the best they had heard at any scientific meeting. Mr. Gissane spoke on major wounds of the hand. He emphasized the need for the expert planning of treatment; in dealing with manual workers, ultimate function was more important than appearance. The doctrine of saving all viable tissues might be dangerous when applied to the hand, because it so often led to the retention of a stiff, painful, and useless portion of that organ and to unnecessary delay in recovery. All workers showed a remarkable ability to make good use of remnants of a hand that

were painless, mobile, and strong. The aim of surgery must be to restore some of the fundamental uses of the human hand. These were: (1) To act as the two sensitive antennae of the body; thus retention of any part of the hand with normal sensation was important. (2) For use as a clamp to hold things down; the retention of the base of the hand alone would suffice for this. (3) To exert a pincer grip; for this function were required a thumb, its remnants, or a surgical replacement, and at least one finger or its remnants; at least one arm of the pincer must be mobile. (4) To serve as a hook to hold and carry; even the little finger would fulfil this purpose. (5) Finally the hand was a vice; for this purpose at least two fingers and the powerful clamping action of an intact thumb were required.

The intact skin of the hand was always covered with a wide variety of pathogenic bacteria. All hand wounds, therefore, were contaminated from the start, and the important factor in preventing infection was the circulatory response within the first few hours of wounding. This emphasized not only the urgency of surgical intervention but also its primary objective—to improve the blood supply to the injured area. Wound cleaning must be gently and thoroughly performed with a non-irritating soap or detergent, and under anaesthesia. Tension must be scrupulously avoided, and the wounded areas covered by some form of skin graft if tension-free suture was impossible. Judged against the likelihood of full restoration of function some common closed injuries of the hand came into the category of major injuries. Bennett's fracture-dislocation of the thumb and some dislocations of the interphalangeal joints of the fingers were best treated by open reduction and suture of the detached capsule.

Mr. R. J. FURLONG (London) confined himself to the problem of the cut flexor tendon. Immediate suture of the tendon was desirable because it kept the tendon in its normal place, which might otherwise become blocked by scar tissue, and because it tended to prevent secondary changes in the muscle and tendon proximal to the division. But primary suture might be undesirable because of contamination or destruction of the skin and other tissues; in that case skin closure alone was indicated, followed by early mobilization of the finger and hand. Secondary procedures such as tendon grafting were apt to fail if the surgeon was inexperienced and particularly if he had the wrong instruments. Primary suture of the profundus tendon distal to the proximal interphalangeal joint might often produce a useful finger, even if the result was a tenodesis. In the no-man's-land between the first interphalangeal joint and the distal palmar crease, primary suture might sometimes succeed if the sublimis tendon were sacrificed, but for injuries here grafting was usually necessary, of course as a secondary procedure. He preferred the palmaris longus with its paratenon for the graft. Judging the length of graft, position for suture, and tension to be exerted were all problems which should be solved by art and experience rather than set rules. The degree of flexion was determined by the position of the resting hand and fingers. The actual method of suture was no longer regarded as important; either silk or stainless-steel wire was a suitable material, although he preferred the latter. It was his practice to close the wound and apply a pressure bandage before removing the tourniquet.

Mr. EMLYN LEWIS (Cardiff) dealt with the problems of skin loss in hand injuries. In the case of some small defects local grafts from the hand itself could be used; sometimes a severely damaged finger could be filleted and used as a flap. When there was wide "degloving," the skin was seldom viable and paring back was better than attempts at primary suture. A free skin graft provided the most useful cover: the full-thickness graft was ideal but technically difficult to use. The split-skin graft was not suitable for direct application to exposed bone or tendon, and in the hand a further drawback was that it did not replace the palmar cushion. Direct flaps could be obtained from the forearm, and the disadvantage of putting both arms

of action could be obviated by suitable positioning. The amount of skin available on the forearm was limited, so that for larger defects he preferred to place the injured hand below the opposite acromion-clavicular joint and take the flap from that site. Abdominal flaps were inclined to be bulky, although they could of course be reduced later. Tube-pedicles provided good skin with an ensured blood supply, but could be used only in the treatment of the late case.

Mr. L. W. PLEWES (Luton) showed a colour film illustrating some of the methods of industrial rehabilitation of the injured hand. Recovery might be delayed by oedema and resulting fibrosis, by a persistent low hand temperature due to post-infective conditions or vasomotor disturbances, and by failure to use the hand at a very early stage for its usual functions. Another, and subtler, complication was extensor spasm, and Mr. Plewes had been able to demonstrate this by means of a specially constructed oscillograph.

Mr. R. G. PULVERTAFT (Derby) introduced the "chirodemon" of the Derbyshire hills in a series of amusing but highly instructive cartoons illustrating the pitfalls and mistakes of hand surgery. He agreed with Mr. Furlong on the importance of using the proper instruments, and said that watchmakers' tools were very suitable. It was his practice to remove the tourniquet before closing the wound, and he had found that bleeding ceased automatically after a few minutes; ligatures were seldom required. Mr. A. L. EYRE-BROOK (Bristol) considered that the tendon slings in the fingers could be divided and would heal when the soft tissues were sutured. He disliked suture of the tendon graft near the distal interphalangeal joint, and preferred to pass it through a tunnel in the phalanx. He had met with necrosis of the graft and later snapping as a complication. Mr. F. C. DURBIN (Exeter) discussed the disadvantages of plaster in the treatment of phalangeal fractures. For some time he had used open reduction and medullary fixation with Kirschner wires. The wires were buried, and were removed after six to eight weeks when body union had occurred. Severe comminution and gross infection were contraindications. Mr. E. MERVYN EVANS (Swansea) made a plea for the wider dissemination of surgeons and facilities for the treatment of hand injuries and indeed of all accidents. It was obvious from the symposium that important surgical decisions had to be taken at the outset of treatment in these injuries, and it was still too often the case that these decisions were being left to house-officers. Mr. R. H. C. ROBINS (Exeter) showed that the post-articular skin would provide very satisfactory grafts for partly amputated finger-tips. Mr. I. LAWSON DICK (Edinburgh) questioned whether it was always necessary to incise the palm along the skin creases, and asked whether pollicization was such a valuable operation as had been suggested elsewhere. In reply Mr. PULVERTAFT agreed that crease incisions were not essential, but they did provide an invisible scar. Mr. EMLYN LEWIS supported the operation of pollicization, and enlarged on the use of the index finger for this purpose in the treatment of congenital deformities.

SECTION OF OTO-RHINO-LARYNGOLOGY

Friday, July 17

Management of Otitis Media

With the president, Mr. R. D. OWEN (Cardiff), in the chair, Mr. I. SIMSON HALL (Edinburgh) opened a discussion on the treatment of otitis media. By means of a chart compiled from the records of cases of acute otitis seen at Edinburgh before and after the introduction of sulphonamides and antibiotics, he showed that the operation for acute mastoiditis had almost disappeared. In his experience the sulphonamides were more effective on their introduction than they now were, so that nowadays they were only

to these drugs was increasing. On the other hand, the number of cases of chronic otitis coming for treatment was increasing, and certainly many more operations for chronic suppurative otitis media were performed at present than in the pre-sulphonamide era.

In the treatment of acute infections the choice of antibiotic depended on the results of bacteriological tests, but as a rule penicillin should be used first, even when no organisms were available for examination. It was much cheaper than the newer drugs, quite as effective in most infections, and rarely gave rise to side-effects. After three days it would be apparent if penicillin was adequate as the sole means of treatment. If not, then in the absence of otorrhoea pus should be aspirated from the middle ear by puncture or myringotomy in order to test for sensitivity. Mr. Simson Hall's next preference was for streptomycin, but the possible damage this might cause to the hearing had to be remembered. When a slight residual discharge was present at the end of treatment of the acute condition, he had found antibiotic drugs of no value. Any apparent improvement was due to the scrupulous cleansing of the ear which was a necessary accompaniment to their use.

Mr. J. I. MUNRO BLACK (Newcastle-upon-Tyne) said that in examining the ear he advised the use of a headlamp and frontal mirror rather than an electric auriscope. The differential diagnosis lay between otitis media, external otitis and boils, mumps, tonsillitis, toothache, or foreign body. Fortunately treatment for otitis media would also cure boils and tonsillitis, so in these conditions a mistake in diagnosis did no harm. The only advantage of the sulphonamides over penicillin was ease of administration, but against this they were less certain in action and might produce side-effects which mimicked complications of otitis. The combined use of the sulphonamides and penicillin should be avoided. The newer antibiotics could be tried if the organisms proved resistant to penicillin. Treatment should be continued till the otitis was better, as shown by cessation of discharge and return of the tympanic membrane to normal.

Failure to maintain improvement might be due to resistant organisms or to some aggravating factor—e.g., enlarged adenoids, sinusitis, or chronic otitis. If the condition worsened or complications developed all treatment should be stopped for 24 hours and the position reassessed. Surgical intervention was now very rarely needed. The decision to operate was determined by the presence of pus or necrotic material which was not absorbing. The prognosis in treated cases was good, most patients being now successfully treated by the general practitioner.

Mr. GEOFFREY H. BATEMAN (London) agreed with the previous speakers that the change in treatment was quite revolutionary. Now the general practitioner had remedies which he could apply with greater advantage in the early stages, he was making an earlier diagnosis with the aid of an electric auriscope. Sulphonamides occasionally masked an infection, but they enabled cases to be watched confidently, and any operation that might be needed could be postponed to the most favourable time, so that post-operative septicaemia had practically disappeared. Penicillin and the other antibiotics had taken us a step further in effective control. But surgery was sometimes necessary, even when the organism was sensitive and the dosage adequate. Because pain disappeared and temperature returned to normal it must not be assumed that the patient was completely cured. In addition the tympanic membrane must have resumed a normal appearance and the hearing have been fully restored. The basis of treatment should be early diagnosis, adequate dosage of penicillin, myringotomy when pus was present in the middle ear, and careful observation of the ear until it and the hearing were normal. Any unsatisfactory feature persisting more than two weeks should call for an otologist's opinion.

In the subsequent discussion Dr. A. J. MACLEOD (North Uist) asked how it was possible to make a satisfactory aural examination in infants and very young children. Mr. MUNRO BLACK replied that in many cases it was impossible. Dr.

ELSIE WARREN (London) asked how the general practitioners could be sure that there was no otitis media when boils blocked the external auditory meatus. Mr. MUNRO BLACK said the same answer applied, though if the infection in the meatus was recurrent the tympanic membrane might be visible in the quiescent periods. Replying to a question about the effectiveness of oral penicillin in children, Mr. Munro Black stated that the evidence was incomplete, but oral penicillin was worth trying. Mr. S. W. ALLINSON (Boston) asked if it would not be most beneficial if parents trained their children to breathe properly. Mr. SIMSON HALL in reply, agreed that this would be so, and was a step in keeping with the modern tendency to stress prevention rather than cure. Dr. M. L. H. EVANS (London) asked if condemnation of the self-illuminating auriscope was advisable, since in his opinion this apparatus had prior place to the clinical thermometer and stethoscope. Mr. SIMSON HALL replied that the auriscope was very useful, but the head mirror was still needed for examination of the nose and throat. Dr. J. T. REES (London) asked Mr. Bateman what advice a school medical officer should give in a case of recurrent otitis with every cold, and should aural drops be used. Mr. BATEMAN replied that the patient should be examined by a specialist to determine the underlying cause, and that aural drops alone were not of proved value. Dr. G. HOYLE (Tamworth) asked whether the general practitioner should perform Eustachian catheterization when the drums were retracted after successful treatment with penicillin. Mr. BATEMAN replied that retracted drums in a child would probably be due to adenoids, which should be removed. Politzer bag inflation was preferable to catheterization. In reply to Dr. A. LAMONT (Inverness) who asked if there was any contraindication to the use of chloramphenicol locally plus systemic penicillin, Mr. BATEMAN replied that chloramphenicol was better avoided, as it commonly caused local reactions, especially in a repeat course. Dr. E. NOEL REES (Llanelli) asked whether the local application of penicillin was indicated. Mr. BATEMAN replied that local treatment was of no value before the drum had ruptured.

Upper Respiratory Tract Infections in Allergic Children

Mr. C. GILL-CAREY (London), a vice-president, then took the chair, and Mr. J. ANGELL JAMES (Bristol) opened a discussion on the diagnosis and treatment of upper respiratory tract infection in allergic children. In a series of 1,208 children he had seen recently 114 suffered from allergy. Examination was difficult because of the highly strung temperament not only of the child but often also of the parents. Further, the allergic reaction masked the appearance due to inflammation, and vice versa. Constrictor sprays might help in nasal examination, but often the nasopharynx could not be examined without a general anaesthetic. When allergy complicated infection swelling might interfere with sinus drainage, so delaying resolution. In chronic allergy the presence of infection was most difficult to recognize, because of infiltration and fibrosis due to the repeated allergic attacks. There was a strong tendency to lymphoid hypertrophy in allergic children. Recurrence of adenoids after operation was particularly common in such children. In investigation of the sinuses it was important to decide if there was pure allergy, pure infection, or a mixture of the two. Symptoms alone might lead to confusion, and skiagrams were very helpful. Histological examination showed that in uncomplicated allergic conditions there was, typically, an irregular swelling of the mucosa with no fluid collection. Proof punctures were not always reliable.

In the treatment of sinusitis conservative measures were sufficient in almost every case, vigorous anti-allergic treatment being employed at the time and continued after the infection had resolved. Surgery in these cases was hazardous. In conclusion Mr. James pleaded for the closest collaboration between paediatrician, allergist, and rhinologist.

Dr. T. A. BRAND (Newport, Mon) held the view that, in children suffering from allergy and infection, operations on

the upper respiratory tract sometimes aggravated the existing allergy or induced a fresh allergy. The paediatrician was of course more likely to see the failures after operation than was the surgeon. Great caution was needed before surgery was undertaken in allergic subjects. A history of recurrent and prolonged colds suggested the possibility of allergy plus infection. In addition to the more commonly recognized symptoms of allergy, a persistent, unproductive cough, worse at night than in the day and not responding to the ordinary remedies, was often complained of. Skin tests were, on the whole, disappointing, as also was specific desensitization based on such tests, though occasionally a dramatic cure might be obtained. Swabs of the posterior nares, allowed to remain *in situ* for at least a minute, often showed the presence of eosinophilia. Radiological examination could be most helpful.

Treatment should, so far as possible, be conservative. Besides avoidance of contact with the offending allergen, non-specific desensitization might be useful. Antihistamines were disappointing, except for promethazine hydrochloride, in seasonal rhinorrhoea. Theophylline with small doses of phenobarbitone sometimes helped. In combined sinusitis and allergy postural instillations of decongestants were sometimes useful, especially when combined with antibiotics in the early stages and with physiotherapy. Surgery should be undertaken only when recurrent severe upper respiratory tract infections had proved a serious handicap to the child's physical and educational development. The parents should always have possible sequelae explained to them, and rehabilitation exercises should always follow the operation.

Dr. J. PEPYS (London) described three ways in which allergy and infection might be associated—infection leading to the development of bacterial allergy (a view not generally accepted); infection predisposing to the onset of allergy by lowering the clinical threshold; and allergy complicated by infection, a common condition in which disturbed nasal physiology due to allergic mucosal swelling was the determining factor. Hence control of the allergy was essential if lasting results were to be achieved by treatment of the infection. In the diagnosis of nasal allergy a history of frequently recurring colds, lacking the usual sequelae, was important, in addition to sneezing and rhinorrhoea. Nasal itching was characteristic. Continuity of care over long periods was necessary, as the allergic state was apt to persist throughout life, though the nature of the allergen might change. From early infancy up to 4 to 5 years of age food allergens—for example, milk, eggs, chocolate, and nuts—were important, but in later years these were largely supplanted by inhaled irritants. In older children desensitization to inhaled irritants could help, but must be done for long periods. Ephedrine or antihistamines by mouth could be most useful, though prolonged administration might lead to anorexia and depression. Local nasal vasoconstrictors should be used with care, lest "rhinitis medicamentosa" developed. The potentially allergic infant should be recognized early, as this might well lead to a reduction in the incidence of allergic disorders.

The main speakers then answered a number of questions. In reply to Mr. R. G. MACBETH (Oxford), who asked, "Was the pneumococcus the commonest organism found in infection associated with allergy?" Mr. ANGELL JAMES stated that he had found the staphylococcus, streptococcus, and pneumococcus in that order of frequency. Mr. I. SIMSON HALL (Edinburgh) asked what decongestant was advisable, ephedrine or the longer-acting ones: to which Mr. ANGELL JAMES replied that ephedrine was used most, "prvine" and "neophryn" occasionally. Mr. F. C. W. CAPPS (London) asked if it was often advisable to remove the allergic child from its parents for a time. Dr. BRAND replied that the child did very well, but on return home almost invariably relapsed. A long period of absence was necessary—say, two or three weeks in hospital, followed by a long convalescence, preferably not at the seaside. Dr. C. EISINGER (London) and Mr. A. MACKENZIE ROSS also contributed to the discussion.

Correspondence

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

Treatment of Acute Malaria

SIR,—In his letter (*Journal*, July 4, p. 41) Sir Gordon Covell, possibly unconsciously, has thrown a spanner into the therapeutics of malaria. As a sincere student of malariology may I be pardoned for asking, "Quo vadis?" And if a specialist in this subject finds himself in a quandary regarding the effective drug treatment of malaria, what must be the state of mind of the practitioner in the Tropics, and, more so, that of the unfortunate student who has to be examined on this subject?

Is the object of his letter a proposal of "back to Methuselah," which in this case indicates a return to quinine as adumbrated by his expression of a "more rapidly acting schizonticide"? If this should be the case then it is permissible to inquire why our old friend quinine has been so persistently relegated to obscurity in recent years. It has even been stated in an annotation (*Journal*, March 15, 1952, p. 590) that the use of quinine in the treatment of chronic *Plasmodium falciparum* infections should be discontinued altogether. If any other evidence were required of the present medley regarding the most effective treatments of malaria, it is to be found in the *Journal* of January 20, 1951 (p. 149), where a puzzling complex combination of drugs is suggested for the various forms of this fever.

A long procession of antimalarial drugs has been witnessed in recent years. Hardly has there been time to assess the merits of one before another, allegedly more powerful, synthetic makes its appearance. It is useful to reiterate at this juncture what Sir Samuel Gee is reported to have said: "Gentlemen, go on using your drugs just as long as they cure."

The difficulties of understanding the present situation commenced with the introduction of pamaquin ("plasmoquin") in 1926 by W. Roehl.¹ Up to this time nobody had had the temerity to suggest that any other drug could supersede quinine in the treatment of malaria. Unfortunately, it proved too toxic in routine use for man. Then came mepacrine in 1931, introduced by W. Kikuth,² and this had properties which appeared to outrival those of quinine. Although at first most doctors in Africa and in this country were disposed to despise it, yet mepacrine maintained its position until the outbreak of the second world war. Nobody ever suggested that its schizonticidal action was as rapid as that of quinine, though the combination of the two proved most efficacious in the treatment of acute subtertian malaria. The official Army view in 1939 was that mepacrine was too poisonous for mass administration to troops in spite of the fact that its prophylactic value had already been proved in Yugoslavia, U.S.A., and E. Africa.³⁻⁵ Here these properties were not rated high at that time, so that it was not until 1942 and the fall of Java that the shortage of quinine forced the attention of malariologists to the potentialities of mepacrine as a prophylactic as well as a curative drug, with the result that malaria was banished as a dominating factor in the war in the Far East. All this is now a matter of history, but we have reached the stage when the virtues of quinine as a powerful schizonticide have already been forgotten by many of the present generation of doctors. The end of the war (1945) saw the introduction of proguanil,⁶ which was the result of intensive research and represented an achievement of great scientific value. The first reports from Liverpool (1945-6) on the treatment of both subtertian and benign tertian malaria were so favourable that they made a very wide impression. To commence with, the doses were so small as to suggest an almost ultra-optimistic attitude. Similar claims were made for its prophylactic properties, the dose for which was stated to be 100 mg. once a week. As the years rolled on the fallacies of this appraisal have become apparent and *passu* the doses of proguanil have been stepped up, so that its advocates now suggest as a curative dose for subtertian malaria 12 times that advocated in 1945. But at the present moment, as Sir Gordon states, its value as a powerful schizonticide in this disease is more than doubtful as its action is far too slow, even

in these large doses. Furthermore, another difficulty in the mass treatment of malaria has arisen in the facility with which resistance to this drug is acquired, and this has led to a further increase in the prophylactic dose of proguanil. In order to counteract this tendency some modern workers have been led to advise the combination of quinine with proguanil to increase its effective action. This suggestion begs the question of why one should employ proguanil at all under these circumstances, since it is considered to play such a minor part in extirpating the malaria parasites. Now we have pyrimethamine, which is the latest comer on the stage. In this case, as related in recent issues of the *Journal*, the story appears to be following the proguanil model. At first minute doses were advocated, 25 mg. a day; then, after a few months' delay, papers are published portraying optimistic results, especially in subtertian malaria, and then others follow which appear to give the opposite impression,⁷⁻¹⁰ but Sir Gordon writes that, as in the case of proguanil, in subtertian malaria pyrimethamine should not be used unless in combination with a more powerful schizonticide. One principle seems to emerge from this conflicting mass of evidence—namely, that when the 8-aminoquinolines, such as pamaquin, were introduced, the therapeutic dose was too large, and the longer the drug remained in use the more consistently was it reduced. In this case it was from 0.12-0.03 g. daily. In mepacrine, which at first was thought to have no side-effects, the reverse has happened and it has risen from 0.3-0.6 g. daily, or even higher, with the result that patients are made actually ill; but in the less toxic compounds, such as proguanil and pyrimethamine, the therapeutic doses become increasingly bigger and bigger as time goes on, and even then, as Sir Gordon states, they do not appear to be powerful enough to halt a subtertian attack.

This letter is not to be taken as a disparagement of these antimalarials which have been forged as a weapon in the fight against malaria, nor is it asserted that the disappearance of malaria from great tracts has not been, in some measure, due to their mass application, but I would like to stress the danger of discarding old friends for new without due consideration. It takes a long time to digest all this new information, and it also takes many years for an antimalarial drug to establish a permanent and lasting reputation, so I am glad to see that this question is so fairly and adequately handled in the newly published book *Clinical Tropical Diseases*, by A. R. D. Adams and B. G. Maegraith. —I am, etc.,

PHILIP MANSON-BAHR.

London, W.1.

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Experiences with Pyrimethamine in Kenya

SIR,—The results obtained by Sir Gordon Covell with pyrimethamine ("daraprim") in preventing non-immune subjects from developing malaria (*Journal*, May 16, p. 1081) are of special interest to practitioners working in malarious areas, such as the Kenya Highlands, where the disease is encountered very often among non-immune Europeans.

Our malaria is almost entirely sub-tertian, and this season it has been exceptionally severe. Numbers of settlers have been using pyrimethamine for prophylaxis, in the manner recommended by the manufacturers. The results which I have personally encountered have not borne out the claims made for this drug, though many have been satisfied by a factorily protected and therefore have not been seen by a doctor. But the fact that there have been fairly frequent failures is of sufficient importance to put on record, as most of the cases occurring after the use of pyrimethamine have been severe, and one, my own child, was nearly fatal.

I have recently treated three cases of malaria in children under 3 years old who had taken their half-tablet of pyrimethamine in the week before the attack. All these commenced with convulsions and the one noted above was an exceptionally severe case. All required intramuscular quinine and sedatives; one of these

cases had a positive blood slide. Two other cases in children under 2, both with positive blood slides, had diarrhoea or vomiting. Two adult men whose slides were negative had severe attacks. Thus there were seven cases, all severe, all of whom so far as could be ascertained had used pyrimethamine as a prophylactic. One other case serves to illustrate a characteristic of this drug which also can be dangerous or fatal. A boy aged 20 months swallowed about 15 tablets while in apparent perfect health. He developed convulsions in about three quarters of an hour which resisted all treatment, and he died two hours later. Necropsy showed cerebral congestion. Histological section did not confirm this, but did show congestion of both kidneys. Chemical examination of the stomach contents showed in various tests a substance which gave identical results to pyrimethamine. This was done to exclude the presence of any other poisonous substance. Two other cases of children consuming up to about 15 pyrimethamine tablets have occurred recently in this area, but the results were not severe. These cases underline the fact that the drug has a relatively attractive taste, and therefore needs to be carefully locked up.

Returning to the prevention of clinical cases of malaria, I would like to suggest that when research is carried out on a new antimalarial drug it should be tested not only on volunteers in Europe, or on the indigenous inhabitants of malarious areas, who probably have a high degree of immunity, and on whom pyrimethamine, at least, works exceedingly well, but also on Europeans living under normal conditions of life in the Tropics. These might well be subdivided into (a) infants, (b) children, (c) adults recently arrived in the Tropics, (d) adults with a long residence and history of many attacks of malaria, and (e) adults with long residence and few or no such attacks. Infants and children could be subdivided into those born in malarious regions and those entering at an early age from abroad. The clinical cases of malaria which are used in the experiments or trials also need careful definition into the various well-known types and grades of severity. It is not enough to say that malaria is prevented or attacks are controlled by a given dosage of a particular drug. The practitioner wants to know whether he can rely on a drug both to treat and prevent pernicious attacks of subtertian malaria, and the milder relapsing types in all cases and under all circumstances. Furthermore, malaria has strange variations in virulence in the same district which require consideration.

It may be that if the records of private practitioners in tropical countries could be made accessible to research workers, they would find much information of the nature indicated, and which would act as a useful check on their own highly controlled experiments.—I am, etc.,

Eldoret, Kenya.

R. Y. TAYLOR.

Post-inoculation Poliomyelitis

SIR,—Dr. James Grant, in his article on post-inoculation poliomyelitis (*Journal*, July 11, p. 66) describes eight cases which occurred in South Tyneside during 1952. Of these, four are shown as having followed the use of combined diphtheria and pertussis prophylactic, but I cannot gather from the text whether the diphtheria portion of this was alum-precipitated or not. He merely describes the material as combined diphtheria toxoid and pertussis vaccine.

I should be glad to know whether the diphtheria component of this material did contain aluminium hydroxide or not, as I think it is a matter of some importance. Admittedly pertussis vaccine alone is apt to be irritant, but there is no doubt that the combined prophylactic containing alum is even more so. To this end I devised a combined prophylactic of pertussis vaccine containing purified fluid diphtheria toxoid without mineral carrier, which I have been using subcutaneously for the best part of three years. This produces no more local reaction at the seat of inoculation than does the same pertussis vaccine when given alone. The Schick-conversion of this material, given as three injections at monthly intervals, is just a fraction under 100%, on observation of over a thousand cases three months after the final injection. The same applies to purified fluid toxoid (Holt) given as three-monthly subcutaneous injections of 0.5 ml. (30 Lf), and for primary immunizations in young children it will be found to cause virtually no reaction at all. It should not be used for boosting doses in older children. The Schick-conversion rate here is also near-optimal three months after the last injection.

Thus I think that the last point of Dr. Grant's summary, that "manufacturers of prophylactics should aim at the production of antigens which will be satisfactory in every way, when given by subcutaneous injection," is already answered. A combined prophylactic, to my original formula, is available from Messrs. Parke, Davis & Co., as W.D.P. (Red), and similar preparations are now marketed by Messrs. Burroughs, Wellcome & Co., and Messrs. Glaxo. The plain fluid toxoid, for use when there is any risk of poliomyelitis in an area, is also available from Messrs. Parke, Davis & Co., and I believe also from Messrs. Burroughs, Wellcome & Co.

I have used nothing but subcutaneous injections ever since I felt that this route might be better for avoiding paralysis.—I am, etc.,

London, S.E.5.

G. BOUSFIELD.

Clinical Research in the N.H.S.

SIR,—In the otherwise encouraging White Paper on this subject¹ it was disappointing to find in paragraph 6 a tacit assumption that "systematic investigations undertaken deliberately and often over long periods" were somehow not within the province of general practitioners but only of "... whole-time clinical professors and clinical research workers ... university professorial units ... research units of the M.R.C. and ... private research foundations." It might not be out of place to remind your readers of the "systematic investigations undertaken deliberately and ... over long periods" by Sir James Mackenzie, whom you mention in your editorial,² by Dr. W. N. Pickles, and by others.

The same assumption seems to underlie the omission of executive councils from among those local bodies which would be authorized to control decentralized Exchequer funds.

It would be unfortunate if the new impetus given to research in general practice by recent events was impeded by any organizational defects that were unwittingly allowed to creep into this otherwise admirable proposal to enrich the life-blood of clinical research throughout the Health Service.—I am, etc.,

Peaslake, Surrey.

G. I. WATSON.

REFERENCES

- ¹ *Clinical Research in Relation to the National Health Service*, 1953. H.M.S.O., London.
- ² *British Medical Journal*, 1953, 2, 140.

A Human Chimera

SIR,—A report in the lay press describes the case of Mrs. McK. (see *Journal*, July 11, p. 81), who is stated to have been "the first human being in medical history with a double set of blood groups." Sir, I beg to differ. In 1943 I joined the Royal Air Force for aircrew duties, and when they typed my blood it was found to be OA. I left England in 1947 for Canada, and the next time I had my blood typed was in 1949 for the blood bank up there. After testing they told me they did not think it necessary for me to donate any. They found it the same, OA. In the Air Force I never came across anyone else with the same group, which fact got me a little worried. However, no matter how many medical officers or laboratory technicians I asked about it, they either would not, or could not, tell me anything, except that I was as healthy as anyone else.

Like the lady mentioned I, too, am a twin. My twin brother still lives in England, and neither of us have had one day's real sickness in about forty years—we are 43 years old. I have a son, 20 years old, who has just got his commission as a fighter pilot in the Canadian Air Force, and my brother has a son and a daughter who are as healthy as the rest of us.

Whether this information will be of any use to you I do not know, but at least I have at last got a definite explanation of what my blood group, OA, stands for.—I am, etc.,

California, U.S.A.

S. BARON.

The Doctor in the Witness-box

SIR,—Viscount Simon in his interesting Cavendish Lecture on the doctor in the witness-box (*Journal*, July 4, p. 1) makes the important observation that the case of the mother who destroys her child is hard to fit into the M'Naghten Rules, but in practice a verdict would be returned which recognized the defence of insanity. I was in a case some years ago where a mother killed her child on learning he was a mental defective—first trying gas then strangulation—because she so dreaded the suffering she imagined in store for him. She was in a highly strung emotional state, but not psychotic, when she performed the act. The case was taken by a very serious judge who asked the jury whether it "really thought she knew what she was doing was wrong?" The jury returned a verdict of guilty but insane in conformity with humanity and common sense, as Viscount Simon supposes.

But since then the Court of Criminal Appeal has ruled that "not knowing the act was wrong" only means not knowing it was contrary to the law. If this is strictly applied in murder, then it virtually excludes every case; only those who were so confused at the time that they did not know the nature of the act, or are so mad as to be unfit to plead, or are idiots, can be said not to know that it is illegal to kill.

One of the defences in favour of the M'Naghten Rules put forward to date is that they have worked, and most of us would agree. But, as Dr. Hobson has remarked, this is not so much due to their intrinsic merit as to the way judges have applied them. But this decision of the Court of Appeal surely rules out a verdict such as in the case cited? For it also stipulated that for the prisoner merely to have thought the act justified was not enough. Yet this is the essence of the case with depressives. They are so depressed that they become suicidal and do not want to leave their loved ones behind, or so deluded that they want to spare others the supposed miseries of this world. Clearly in both cases their judgment is completely unbalanced, and they feel their act justified morally, but they are not so bereft of reason that they do not know that to kill is against the law. Yet the Court of Appeal's ruling makes this the only criterion.

I am not writing this from the motives of supposed sentimentality of the psychiatrist, but because crimes committed as a result of genuine depressive states are those where not only the public but judges, and indeed Viscount Simon himself, feel the criminal should be treated (in an institution of course) yet should not pay the supreme penalty. But if the M'Naghten Rules are to be applied without any flexibility how can they work in these cases? I am not a lawyer, and I would be exceedingly interested to know Viscount Simon's views.—I am, etc.,

London, W.1.

W. LINDESAY NEUSTATTER.

Intravenous Barbiturates for Drunkenness

SIR,—Dr. A. M. Bartley's letter (*Journal*, July 11, p. 95) dealing with my criticisms of his treatment for obstreperous cases of drunkenness is, I believe, based upon certain assumptions which could lead to serious mishaps were they widely accepted by casualty officers or by any practitioners whose duty involved treating cases of this kind.

I am not advocating routine stomach wash-out as a preliminary to thiopentone administration to those cases of violent drunken disorientation, but stand by my original condemnation of this therapy. I have indeed attempted to wash out the stomachs of obstreperous drunks amidst a flurry of fists and to the accompaniment of much choking and retching. It is the difficulty of this traumatic procedure, and the uncertain degree of success obtained in thoroughly removing the contents of the overloaded stomach, which would make me loath to administer an intravenous barbiturate to these individuals. Moreover, the performance of this manoeuvre has often demonstrated that the stomach

has by no means been emptied even by the spontaneous vomiting which has occurred during the stage of obstreperous behaviour.

Certainly the dangers of "silent regurgitation" and glottic spasm are every bit as great in certain types of emergency surgical cases—particularly cases of intestinal obstruction. It is for that very reason that many anaesthetists in these cases avoid a thiopentone induction at all costs and induce anaesthesia by a slower, safer inhalation technique, at least until the airway has been safeguarded by some means such as cuffed endotracheal intubation. If in such cases thiopentone induction is used, then it is established practice among many anaesthetists to lessen the risk of regurgitation by placing the patient in a slight reverse Trendelenburg tilt prior to injection and, in any case, by performing the induction with a sucker ready at hand for immediate use.

In conclusion, I feel that if thiopentone were widely used as a means of quieting unruly drunks, desirable though this end may be, without the facilities of an anaesthetic-room available, there would be introduced a far graver hazard to life than if intramuscular paraldehyde or apomorphine were substituted.—I am, etc.,

London, W.2.

PETER NOBES.

Phenylbutazone

SIR,—The toxic reactions after phenylbutazone ("butazolidin") therapy given for various arthritic conditions are well known, and include anorexia, nausea, vomiting, diarrhoea, dermatitis, palpitations, and, finally, agranulocytosis and sometimes complete aplasia of the bone marrow. The importance of these reactions has been stressed in many recent articles and in particular by Drs. J. R. Nassim and Thomas Pilkington¹ and by Dr. J. C. Leonard.²

I have taken 28 consecutive cases of rheumatoid arthritis, 20 of osteoarthritis, and two of gout which have been treated with this drug. The majority had 0.2 g. three times a day, reducing the dose in many instances to 0.2 g. once a day. Seven received intramuscular injections of 1 g. twice a week, reduced to 1 g. once a week after one month. The majority of the patients have been treated in this way for nine months and none for less than three months. All those with severe symptoms were admitted into hospital and the effect of the initial doses of phenylbutazone carefully assessed. After discharge from the wards they joined the others attending the out-patient department at intervals varying between one and three weeks. The possibility of toxic symptoms occurring was explained to each one, and they were told to stop the drug immediately if this happened and to report back to the clinic the following week.

All the toxic reactions which I have experienced have been mild and have either responded to a reduction in the dose or disappeared spontaneously without any interference. There was only one exception. Severe vomiting in this instance caused the drug to be stopped. The toxic symptoms encountered in this series of 50 people were: palpitations, 1, conjunctivitis 1, nausea 9, vomiting 5, swelling of eyes 2, pruritus 1, diarrhoea 2, dermatitis 4, ulcerated gums (without agranulocytosis) 2.

Twenty-seven of the 50 patients, therefore, experienced some unpleasant symptoms, and this was higher than reported by Nassim and Pilkington (46 out of 109), is about the same as that reported by Cudkowicz and Jacobs,³ but higher than the average of 22% quoted by Leonard after a review of the literature. My results have differed from those of Nassim and Pilkington in one important respect: it was only necessary to stop the drug once, whereas they had to withdraw the drug in 46 out of 109 patients.

Out of the 28 patients suffering from rheumatoid arthritis, 21 had a very good result, three a moderate result, and one was made worse. Out of the 20 cases suffering from osteoarthritis, a very good result was obtained in 13, moderate in three, and a complete failure in four. Both those suffering from gout were almost cured. Forty-two out of the 50 cases have derived considerable benefit from this drug: this figure is much higher than that quoted by Nassim and Pilkington (59 were greatly improved out of a total of 109).

The only other treatment for rheumatoid arthritis which has gained any popularity is that with injection of gold salts, and favourable results with this therapy have been few and troublesome complications due to dermatitis, liver and kidney damage, etc., have been frequent. Furthermore, there is no other drug known which will effectively alleviate the pain in osteoarthritis. The treatment of gout with

colchicum, cinchopen, or salicylates is uncertain. These facts must be taken into account before too much emphasis is placed on the toxic side-reactions of phenylbutazone.—I am, etc.,

Birmingham, 18.

R. O. GILLHESPY.

REFERENCES

- ¹ *British Medical Journal*, 1953, 1, 1310.
- ² *Ibid.*, 1953, 1, 1311.
- ³ *Lancet*, 1953, 1, 223.

Bornholm Disease

SIR,—The numerous excellent descriptions of the 1951 epidemic of Bornholm disease, or, as our Norwegian colleagues prefer, epidemic pleurodynia (*Journal*, June 20, p. 1345), and the letters from readers indicate a widespread interest among British physicians in the events of that late summer. Laboratory studies provide evidence of the responsibility of Group B Coxsackie viruses, as pointed out in your leading article (p. 1379). Type B3 apparently was prevalent. It also accounted for epidemics in the U.S.A. in 1950 and 1951, and was identified in Australia the same year. It may have been responsible for the epidemic on the Continent as well. We must wait for more information from the laboratories. Meanwhile it is worth noting that while B3 has now been repeatedly implicated, another type, B1, which has not appeared for some years, was the aetiological agent of the American cases in 1948 which led Dr. Curnen to suggest that Coxsackie viruses might be the cause of Bornholm disease.¹

The virologists can be relied upon to solve the question of how many types cause Bornholm disease by comparing their strains and identifying them in terms of a common terminology. Meantime a second point which may have more general interest seems to have attracted little attention in Great Britain. It is whether poliomyelitis and Bornholm disease ever occur simultaneously. The records indicate that 1951 was a relatively light poliomyelitis year in England and Wales, but I find no comment regarding the concurrence or competition of the two diseases. This has attracted attention in the past.

The first statement to come to my attention was that of Gsell,² who described a 1940 epidemic of Bornholm disease in Canton Appenzell and mentioned that an epidemic of poliomyelitis did not occur in 1940 and that "not a single case of infantile paralysis appeared during that summer and fall in Gais and Teufen." Linberg,³ I have since found, made a similar comment regarding a Norwegian outbreak in 1934. There are others. Lazarus,⁴ describing the epidemic in the State of Washington in 1950, the first association of type B3 with Bornholm disease, wrote, "... only one case of paralytic poliomyelitis occurred in Hoquiam during the 1950-1 season, when the pleurodynia epidemic took place. The incidence of poliomyelitis in Grays Harbor County during the same season was about 15 per 100,000 population. Preliminary data indicate that the same thing is happening this year, with cases of pleurodynia again appearing and paralytic poliomyelitis being at a low level." Gabinus, Gard, Johnsson, and Pöldre⁵ investigated an outbreak in south central Sweden in 1950. They mention, "No cases of paralytic poliomyelitis appeared in this region."

During 1951 the disease was widespread in southern Germany. Gärtner⁶ wrote, "In no place where Bornholm disease occurred was a single case of paralytic poliomyelitis recognized." And from Stuttgart, Windorfer and Born⁷ reported, "Interestingly in the same period only one definite case of paralytic poliomyelitis occurred in Stuttgart."

Dr. R. L. Huebner tells me there was not a single case of poliomyelitis in the Texas counties in which pleurodynia was prevalent during 1951, but there was little or no poliomyelitis the following summer as well. He established a type B3 virus as responsible for the outbreak. On the other hand, a type B3 virus appears to have caused widespread disease in Sydney, Australia, late in 1951, and Dr. Stanley⁸ was greatly impressed by the coincidental disappearance of poliomyelitis. It had been prevalent the previous year and returned in force in 1952. Most recently I find a description of an epidemic in Reykjavik, Iceland,⁹ and the comment, "In this period no cases of anterior acute poliomyelitis or aseptic meningitis were reported."

I mention these observations in the hope that readers of the *Journal* may have evidence that bears on the point.

Proof of an interference between the two in nature may be difficult to establish. Certainly all we have so far is merely suggestive. But the evident interest of your readers in the epidemic leads me to think they may have confirmation, and I would be grateful to them for their comment.—I am, etc.,

Albany, New York.

GILBERT DALLDORF.

REFERENCES

- ¹ Bull. N.Y. Acad. Med., 1950, 26, 335.
- ² Schweiz. med. Wschr., 1941, 71, 83.
- ³ Acta paediat., 1937, 19, 1.
- ⁴ Amer. J. publ. Hlth., 1952, 42, 20.
- ⁵ Arch. ges. Virusforsch., 1952, 5, 1.
- ⁶ Dtsch. med. Wschr., 1952, 77, 151.
- ⁷ Ibid., 1952, 77, 1012.
- ⁸ Aust. J. exp. Biol. med. Sci., 1953, 31, 31.
- ⁹ J. Amer. med. Ass., 1953, 152, 814.

Prognosis in Diabetic Pregnancy

SIR,—In his interesting article (*Journal*, June 27, p. 1413) on the prognosis in diabetic pregnancy Dr. Wilfrid Oakley states that his results fail to confirm the existence of any direct relationship between age of onset of maternal diabetes and foetal loss. As mentioned in the article, this relationship was found by me,¹ but in a series of babies weighing 2,500 g. or more from patients without adiposity. Dr. Oakley uses for his study of this point his total King's College Hospital series (267 of 275 babies), and this may be the reason why the relationship was not found by him.

To get a clearer concept of the causes of the high foetal mortality and of what might be accomplished by a certain treatment, one has to know something of the "natural" prognosis in different groups of patients. The two most important factors seem to be parity of the mother and age of onset of diabetes,^{2,3} which cannot be influenced by any treatment. To use a total material for analysis without classifying may obscure everything but the gross mortality.

In his section on foetal hypoglycaemia, Dr. Oakley concludes that this problem clearly needs further study. I am inclined to draw the opposite conclusion. From what Dr. Oakley tells us it is evident that no relationship exists between foetal hypoglycaemia and neonatal death. In my rather extensive work⁴ on this topic I came to the same result. Since 1946 the newborn infants have not received glucose at the lying-in department B of Rigshospitalet, Copenhagen. It is a characteristic feature of the newborn young of mammals that they can stand a low blood sugar.—I am, etc.,

Copenhagen.

JØRGEN PEDERSEN.

REFERENCES

- ¹ Trans. XIIIth Brit. Congr. Obstet. Gynaec., 1949, p. 186. Austral Press, London.
- ² Ugeskr. Læg., 1951, 113, 1771.
- ³ Diabetes and Pregnancy. Blood Sugar of Newborn Infants, 1952, p. 230. Danish Science Press, Copenhagen.

Tropical Diseases in Britain

SIR,—May I be allowed to draw attention to the following points raised in your annotation, "Tropical Diseases in Britain" (*Journal*, May 16, p. 1096)? I entirely agree with Professor W. Melville Arnott's insistence in his letter (*Journal*, May 30, p. 1219) that time must not be lost in starting therapy in cases of malignant tertian malaria, and that in the seriously ill patient intravenous quinine is the most effective treatment.

The writer of the annotation claims that "true hookworm disease occurs only in debilitated populations suffering from heavy infestations superimposed on malnutrition and the avitaminoses; it is not seen in the well-nourished." In the last year I have seen many Europeans carrying ankylostoma ova who were not suffering from "true hookworm disease," but I have also attended two senior officers who were suffering from ankylostomiasis, the clinical features including the rash, pulmonary symptoms and signs, and a heavy intestinal load of parasites, resulting in both cases in severe debility. Both these officers were harassed, frustrated, and overworked, but neither was, or had been, malnourished nor presented any feature of the "avitaminoses."

The other statement in the annotation with which I cannot agree is that "emetine . . . should find no place in the diagnosis" of amoebic dysentery. In my experience the patient who suffers from dysentery which does not respond to phenylsulphathiazole in adequate dosage, and in whom *Entamoeba histolytica* or its cysts cannot be found on examination of several stool specimens, very frequently produces amoebae or cysts in the stools after one dose of 1 gr. (65 mg.) emetine. Further, the case of "pyrexia of unknown origin" in the Tropics may be due to amoebiasis, and if it has been impossible to find a cause for the illness, it is worth trying a course of emetine as a diagnostic measure.

In this part of the world a doctor or a laboratory technician is not expected to be an "experienced pathologist" in order to be able to detect the presence of *E. histolytica* or its cysts in a specimen of faeces, or to be able to differentiate such protozoa from the free forms or cysts of entamoebae which are at present considered to be of little pathological importance.—I am, etc.,

Kaduna, Northern Nigeria.

BRUCE NICOL.

Medical Auxiliaries

SIR,—The letter from Dr. A. P. Cawadias (*Journal*, July 11, p. 96) appeals on somewhat emotional grounds for "equal rights" under the N.H.S. for the three associations of physiotherapists he mentions. The Ministry's only interest in this matter should be in the standard to which medical ancillary bodies shall be required to attain before their members are accepted for employment in the N.H.S., and the absence of any reference to such standards in the Ministry's recent proposed regulations is a cause of considerable concern to many members of the medical profession.

Most of us have in the past relied upon members of the Chartered Society of Physiotherapy, because we know that they have undergone a full-time three-year training at one of the recognized hospital training schools. The published report of the evidence given before the Cope Committee gives little evidence of similar standards of training being required by the other associations mentioned by Dr. Cawadias. It was possibly for this reason that the Cope Committee felt it could not recommend the acceptance of the certificates of these associations for employment under the N.H.S. It may be, however, that further information is now available regarding the training syllabus of these bodies, and where it is carried out; if so this would be of considerable interest in view of Dr. Cawadias's plea.—I am, etc.,

London, W.1.

W. S. C. COPEMAN.

POINTS FROM LETTERS

Cord Traction

Dr. JAMES T. BURROWES (Jamaica) writes: May I be allowed to record my support of Dr. F. C. R. Picton (*Journal*, April 18, p. 887) and the Brandt-Andrews method of placental extraction? This method gives such good results that the routine use of ergometrine intravenously before the commencement of the third stage would appear to be unnecessary.

Treatment of Herpes Simplex

Dr. GORDON J. C. HERD (Elstree, Herts) writes: During the past year I have treated a number of cases of herpes simplex by the application of 10% chloramphenicol in propylene glycol. The eruption in most cases was confined to the lips, the first manifestation having presented some 12 to 24 hours previously. The area involved is washed with soap and water and then painted with the solution, which is left to "dry in." Treatment is repeated twice daily (morning and evening) for about three days. Following the initial application, local discomfort is alleviated, no further extension of the lesions occurring. Within 36 hours there is a marked diminution in the size of the vesicles. These generally break down by the third or fourth day, leaving small areas of granulations which subsequently heal. The only disadvantage I have observed is the unpleasant taste of the preparation should it find its way into the mouth. This effect, however, is evanescent.

Obituary

GERALD SHEEHAN, M.B., Ch.B.

The sudden death on July 11 of Dr. Gerald Sheehan at the age of 54 has removed from the civic and medical life of Carlisle one who had been an outstanding personality in his native city for over 30 years.

Born on June 6, 1899, the eldest of a family of 13, Gerald Sheehan graduated from Manchester University at about the time of his 21st birthday by taking the degrees of M.B., Ch.B. in 1920. He then took over the large general practice established by his father, Dr. Patrick Sheehan, who in his day was also a notable figure in Carlisle and who died the year before his son qualified in medicine. It was a considerable responsibility for a young man to bear, as in addition to the rough-and-tumble of general practice he had to consider the education of a large family, some of his brothers and sisters being already students of medicine. In all, seven members of the family became doctors. In this task Dr. Sheehan had the support of his mother and the benefit of her counsel and advice.

In 1930 he was elected to the Carlisle city council, and six years later he became chairman of its health committee. In 1949 he was unanimously voted to the mayoral chair. His professional and civic attainments made him admirably suited for the chairmanship of the Carlisle Executive Council, an office he held at the time of his death. He was also chairman of the local medical committee.

A kindly and friendly man, Gerald Sheehan had no enemies and was a good colleague, always willing to lend a hand. In time of stress or difficulty no fellow practitioner ever appealed to him in vain. In his professional duties he was ably supported by his sister, Dr. Kathleen Gillow, who carries on the practice. A devout Roman Catholic, he served his Church in many ways. For these services the Pope appointed him a Knight of the Order of St. Gregory. To his widow, formerly Miss Dorothy Johnson, and his three children and to his mother and the other members of the family the heartfelt sympathy of his colleagues is extended.—W. F.

R. J. W. MAWHINNY, C.B., L.R.C.P.&S.I.

Colonel R. J. W. Mawhinny died at Nottingham on July 16 at the age of 85. Robert John Watt Mawhinny was born on December 4, 1867, the youngest child of the late Dr. Thomas Mawhinny, of Mount Nugent, Co. Cavan, Ireland. As a young man he distinguished himself as a student and as a sportsman. He was awarded the gold medal for operative surgery at the Carmichael School of Medicine, Dublin, where he qualified L.R.C.P.&S.I. in 1888 at the early age of 20, and in the same year he won the Ormonde Cup for Ireland as a swimmer.

In 1890 he entered the R.A.M.C. and thus began a notable career in the Army which was to last 34 years, nearly all of which were spent in service abroad, 23 of them in India. During the South African War he took part in the defence of Ladysmith and was present at the engagement of Nicholson's Nek. He was mentioned in dispatches and received the Queen's medal with six clasps.

Earlier he saw service with the Isazai expedition of 1892, the Chitral expedition in 1895, and on the Punjab frontier in 1897–8, receiving the medal and clasp. In 1907 he took the D.P.H. of the Irish Royal Colleges. Promoted to lieutenant-colonel in 1912, he returned to India on the outbreak of war in 1914 after a short period of duty in Ireland. For his active service on the North-west Frontier with the Mohmand expedition in 1915, as A.D.M.S., Peshawar Division, he was mentioned in dispatches, and in the following year he was appointed C.B. By that time he was in Mesopotamia as A.D.M.S., Lines of Communication, Indian Expeditionary Force "D," and distinguished himself further by evacuating casualties by river in very difficult circumstances. He was invalided back to India and appointed A.D.M.S. to the Mari Field Force "B," for which service he received a further mention in dispatches. His promotion to colonel in 1921 was antedated to 1918, and in 1922 he held the appointment of D.D.M.S., Southern Command, India.

After his retirement from the Army in 1924 he went to live at Exeter, where he was in medical charge of troops from 1926 to 1932. Re-employed as an Army medical officer from 1939 to 1944, he was thus able to continue a happy association with the Devonshire Regiment which began when he was a young regimental medical officer during the South African War. Next to medicine his great interest was sport, for all forms of which he was naturally gifted. Apart from his prowess as a swimmer, he was a good swordsman, an excellent horseman, and a first-class shot. His life-long hobby, however, was fishing with the dry fly, preferably one he had tied himself. He married Miss Kathleen S. McEntire and there was one daughter of the marriage. Mrs. Mawhinny died in 1950.

F. V. NANKA-BRUCE, O.B.E., M.B., Ch.B.

Dr. F. V. Nanka-Bruce, a general practitioner well known on the Gold Coast, died on July 13 at the age of 74. He was president of the Gold Coast Branch of the British Medical Association.

Frederick Victor Nanka-Bruce received his early education first at the Government Boys' School, Accra, and then at Queen's College, Lagos, Nigeria. On his return to the Gold Coast he entered Government service as a dispenser and was attached to the expedition which went to Kumasi in 1900—an event which precipitated the last Ashanti War—and with the Governor of the Gold Coast, Sir F. Hodgson, and his party he was besieged in Kumasi Fort until the expedition managed to escape through the Ashanti lines to the coast. Shortly afterwards Nanka-Bruce was sent to Edinburgh University to study medicine, and he duly graduated M.B., Ch.B. in 1907. He then returned to Accra, being the second African to practise medicine in the Colony.

He built up a practice which, at the time of his death, had assumed very large proportions. His name in that part of West Africa came to be regarded as synonymous with scientific medicine and for the efficient treatment of disease sympathetically carried out. Dr. Nanka-Bruce had a very full life. He represented the best type of general practitioner, and he had a high regard for the standing of his profession. The old and the poor were always assured of an understanding reception at his hands, and he gave free treatment and financial assistance to many of the poor of Accra, among whom he spent most of his life. Apart from medicine, which remained his main interest up to the time of his death,

Dr. Nanka-Bruce served his country in a variety of ways. He was a member of the Legislative Assembly from 1931 to 1935 and again in 1946. In 1935 he was appointed O.B.E., and in 1937 he was a representative of the Gold Coast at the Coronation of King George VI. For many years he was a member of the Accra town council, and in 1949 he served on the Coussey Commission which drafted the present Constitution. In 1918 he founded the Independent Press, which produces the *Accra Daily Echo*, and of which he was managing director up to the time of his death. He was also a founder member of the Accra Turf Club, and was chairman of the board of stewards from 1943 to 1944, being himself the owner of racehorses.

Deeply interested in education, Dr. Nanka-Bruce served on the Achimota College Council and was manager of the Accra Royal School and chairman of the board of the Accra Academy. The confidence and esteem in which he was held by his fellow practitioners were shown by his election to the presidency of the Gold Coast Branch of the British Medical Association last February. His death leaves a gap in the public life of Accra which will not be easily filled. He was a good doctor and a good man whose counsels were respected and opinions valued.—H. B. L. R.

Medical Notes in Parliament

Cost of Social Services

During the debate in the House of Lords on July 21 on the motion for the second reading of the Finance Bill Lord SHEPHERD said there had not been a very great increase in the last few years in expenditure on the social services. The cost of these in 1938-9 represented 9.2% of the then national income. In 1950-1 the cost was 11.7%, and in 1951-2 it became 11.5%. If the conditions of the population in 1938-9 had been the same as in 1951, from £50m. to £80m. would have had to be added to the cost of the social services, bringing the proportion of expenditure from the national income for 1938 to the level of last year.

The Bill was read a second time and subsequently passed.

Payment of Scientists

During a debate on July 20 on science and productivity Sir HUGH LINSTADT said the House of Commons had to face the problem of the proper payment of scientific teaching personnel in universities. The same problem had been faced and overcome in medicine. When consultants in the full-time employ of the National Health Service were able to get £5,000 a year from the State, it was no longer possible to employ professors of medicine in the universities at, say, £2,500 a year if men of the right calibre were needed. The universities therefore had to upgrade the status and pay of professors of medicine. The same problem had to be tackled in relation to professors of engineering.

Replying to the debate, Sir WALTER MONCKTON said a programme of research was being launched under the auspices of two committees set up by the Department of Scientific and Industrial Research and the Medical Research Council. Leading industrialists would sit down with professors to think out what could be done to improve the position.

Cost of Prescribing

Colonel STODDART-SCOTT on July 23 asked the Minister of Health what immediate steps he proposed to take to encourage doctors to reduce the present high cost of prescribing and so release funds for improvement elsewhere in the National Health Service.

Mr. IAIN MACLEOD replied that, without prejudice to their right to prescribe whatever they thought necessary in an individual case, he had recently invited all doctors to re-examine the cost of their prescribing. They had been supplied with lists of proprietary preparations classified by the Joint Committee on Prescribing. He had suggested to doctors that they should not prescribe other proprietary preparations without first comparing the cost with that of equivalent or similar standard preparations; and had reminded them of the need for proper economy when prescribing standard products. He had been assured of the co-operation of the medical profession in the efforts to keep the cost of prescribing within proper limits.

Peptic Ulcer

On July 23 Dr. BARNET SIROSS asked the Minister of Health what estimate he had of the numbers of citizens suffering from duodenitis and from gastric and duodenal ulcers. He also asked how far liquid milk was still advised by his department in treating these conditions.

Mr. MACLEOD replied that no figures were available for duodenitis, but it was estimated that about 1 person in 100 in England and Wales suffered from gastric or duodenal ulcer. There was no evidence of any material change in total numbers in recent years, but the number of deaths from duodenal ulcer had increased and that from gastric ulcer had fallen. Responsibility for the treatment of patients must rest with the doctors in charge. His department did not issue advice in these matters.

Unfilled House Appointments

Mr. W. NALLY asked the Minister of Health on July 23 what advice he had given, or what assistance he proposed to render to, the Wolverhampton Hospital Management Committee, which, as a consequence of being unable to fill house posts in the Royal Hospital, Wolverhampton, had been compelled to circularize all industrial first-aid posts in the area asking them to avoid sending patients other than urgent cases to this hospital.

Mr. MACLEOD said he was having an inquiry made. The shortage of junior medical staff in hospitals was general in the region.

Anaesthesia for Childbirth

Miss PAT HORNSBY-SMITH said on July 23 that, while Mr. Macleod had seen a number of allegations about inadequate provision of anaesthesia or analgesia for childbirth, he had only two complaints from mothers in the last two years. In areas where the administration of gas-and-air by midwives was below average the local health authorities were aware of the position. The proportion of administrations was steadily increasing from year to year.

Air Pollution

Replying on July 21 to Mr. SOMERVILLE HASTINGS, Mr. A. E. MARPLES said a committee was being appointed jointly by Mr. James Stuart and Mr. Geoffrey Lloyd to "examine the nature, causes, and effects of air pollution and the efficacy of present preventive measures, to consider what further preventive measures are practicable, and to make recommendations." Medical men on the committee are Dr. J. L. Burn, medical officer of health, Salford County Borough Council, and Professor T. Ferguson, professor of public health and social medicine, Glasgow University.

Health Service Charges

Mr. H. MARQUAND asked the Minister of Health on July 23 whether he would present a White Paper reviewing the effects of the charges for appliances and treatment in the hospital and general-practitioners' services imposed in 1951 and 1952.

Mr. MACLEOD replied: No, Sir. This information could best be given by Parliamentary question and answer.

Mr. MARQUAND asked whether the Minister's attention had been drawn to a statement by Dr. A. J. Macleod

(*Supplement*, July 18, p. 40) to the effect that a recent speech by the Minister of Health suggested that he was anything but confident about the 1s. charge? Were they not entitled to more information?

Mr. MACLEOD said he was delighted to see this additional proof of the slow conversion of the Opposition to the point of view of those called Macleod, who came from the Western Isles.

Mr. BLENKINSOP asked whether the Minister did not recognize that the House welcomed the conversion of the British Medical Association to the point of view expressed always from this (the Labour) side?

National Service Boards

Replying on July 23 to questions by Mr. N. N. DODDS and Mr. J. SNOW, Sir WALTER MONCKTON said he was engaged in consultations with chairmen of medical boards. He had already arranged for the boards to be reminded of the importance of making a full inquiry into the candidate's medical history and of paying full attention to consultants' reports. He was amending the forms sent with the summonses to medical examination so as to draw attention to the fact that medical certificates or reports brought to the examination would be fully considered. Mr. H. Watkinson, the Parliamentary Secretary, had already started personal visits to medical boards. He proposed to do the same after the House rose. The most fruitful course would be to complete the steps which were already in hand and the examination of the individual cases brought to his notice. He also proposed to make a further investigation, with the co-operation of the Services and the Ministry of Pensions, into all cases of men discharged during a recent period shortly after entry with a view to determining the present extent of error and whether it appeared to arise most commonly in certain types of cases or districts.

Replying to Mrs. E. BRADDOCK on July 23, Sir WALTER MONCKTON said no instructions had been given that medical boards must not turn down more than a certain percentage of men in each of the categories. In answer to Mr. SNOW Sir WALTER MONCKTON said on the same date that about half the cases rejected by medical boards were psychiatric cases.

Mr. H. WATKINSON had said on July 21 that 25 chairmen of medical boards were over 70 years of age.

Strawberry Jam.—The average vitamin-C content of strawberry jam is 16 mg. per lb. (35 mg. per kg.). The corresponding value for the fresh strawberries used in the preparation of a pound of jam is 96 mg.

Medico-Legal

THE CHANGING LAW

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Few Englishmen really understand how the English constitution works unless they are professionally concerned, either as politicians or as lawyers, in helping to work it. In *The Changing Law*,* a collection of addresses given to English universities, Lord Justice Denning sets out to draw a picture of the changes by which the law is adapting itself to the social and constitutional revolution of our time. In doing so he provides the ordinary man with a vivid insight into the genius of the constitution, and shows how English law has developed, and is developing, to hold the balance between man and the State and between man and man.

Doctors will find much in the book of direct interest to them. They will see how one of the living masters of the Common Law treats the problems which have been discussed recently in the medico-legal columns of the *Journal*, and among the cases with which the theme is illustrated they

*Published by Stevens and Sons, London, 1953, pp. 122, 10s.

will meet some old friends that have been reported there. They will see how actions for negligence against hospitals have served in the maintenance and development of the rule of law in the Welfare State and in the law of master and servant. They will find what Lord Justice Denning thinks of the M'Naghten Rules and the criminal responsibility of the insane in the situation pointed by the cases of Straffen and Miles Giffard.

Some of Lord Justice Denning's views upon the law do not command universal acceptance. Few, however, who read his book will fail to be glad that he has written it.

Universities and Colleges

UNIVERSITY OF ST. ANDREWS

The degree of M.D. has been conferred on J. Stephen Law.

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—Ann C. Alabaster, W. G. G. Brand, Florence M. Danjoux, A. M. Dick, A. A. Lakeru, J. A. Lawrie, C. S. Leithhead, R. Markham, F. D. Marples (with commendation), C. A. H. Marr, Margaret A. H. Ness, R. G. M. Poston, J. Smart (with commendation), E. Sweeney, Mary E. C. Wright.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College held on July 21 with the President, Dr. W. A. Alexander, in the chair, it was announced that the following distinguished members of the medical profession had accepted Honorary Fellowship of the College: Professor Charles Herbert Best, F.R.S., professor of physiology and director of the Banting and Best Department of Medical Research in the University of Toronto; Sir Walter Russell Brain, President of the Royal College of Physicians of London; Sir Frank Macfarlane Burnet, F.R.S., director of the Walter and Eliza Hall Institute, Melbourne, Australia; Sir Charles Ernest Hercus, professor of bacteriology and public health in the University of Otago and dean of the Medical Faculty; Sir Gordon Morgan Holmes, F.R.S., consulting physician to Charing Cross Hospital and to the National Hospital for Nervous Diseases; Sir Robert Muir, F.R.S., emeritus professor of pathology in the University of Glasgow; Sir John Parkinson, consulting physician to the Cardiac Department of the London Hospital and to the National Heart Hospital.

The following were elected Members of the College: J. R. Bailey, W. A. Murray, M. A. Wafa, T. J. Danaraj, H. Foster, E. L. Davis, M. Macleod, R. S. Norton, M. Scott-Gray, G. J. V. Perera, D. E. P. Forbes, A. V. A. Vethanayagam, C. H. Gurd, H. P. Vaishnava, D. J. Gudex, Ata-Ul Haq, K. R. Tyler, R. W. H. Simmons, A. Pines, E. O. L. Hoskins, S. G. F. Wilson, S. I. Kuper, P. A. Rechnitzer, G. W. Allan, A. Nestadt, H. D. Jacobs, K. S. Husain, R. Kilpatrick.

SOCIETY OF APOTHECARIES OF LONDON

Sir Wilson Jameson, Master, presided at recent meetings of the Court of Assistants of the Society. Dr. C. F. White, Mr. A. M. A. Moore, and Sir Lionel Whitby were elected to seats on the Court. Dr. Frank Howitt was re-elected as the Society's representative on the British Postgraduate Medical Federation and Dr. G. Hamilton Hogben was appointed representative of the Society on the Central Council for District Nursing in London.

The Honorary Mastery of Midwifery was bestowed upon Sir William Gilliatt in recognition of his eminence in this field, and the Society's Gold Medal in Therapeutics was presented to Sir Charles Harington, F.R.S., in commemoration of his work which led to the synthesis of thyroxine. The presentations were followed by a soiree at which the Society's plate and other treasures were exhibited.

The Society's records from 1617 to approximately 1850 have been deposited in the Guildhall library.

The following candidates, having completed the final examination, have been granted the Diploma of the Society, enabling them (upon complying with the requirements of the Medical Acts) to practise medicine, surgery, and midwifery: T. P. Oliver, R. G. Orr, T. F. Stoye, P. Jensen, S. T. Guest, J. Cottam, E. P. James, W. F. T. Davies, J. R. Croning, R. H. Morgan.

The following candidates were successful in the recent examination for the Diploma in Industrial Health: C. P. Chivers, K. B. Roy, R. Whitelaw.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending July 11 (No. 27) and corresponding week 1952.

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

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

CASES In Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	17	2	7	0		30	4	8	2	1
Dysentery ..	525	109	107	4	3	180	51	51	3	2
Encephalitis, acute..	5	2	0	0		5	0	1	1	
Enteric fever:										
Typhoid ..	6	1	2	0		2	1	1	1	2
Paratyphoid ..	3	0	2(B)	1		21	13(B)	0		
Food-poisoning ..	524	143		1		168	8		2	
Infective enteritis or diarrhoea under 2 years ..					27	31			8	22
Measles*	5,504	110	158	197	129	6,720	605	141	221	293
Meningococcal infection ..	38	4	6	1	1	23	0	16	1	1
Ophthalmia neonatorum ..	45	8	9	0		38	8	14	0	
Pneumonia†	315	18	143	4		314	15	143	7	1
Poliomyelitis, acute:										
Paralytic ..	118	15	7	5	5	61	25	5	5	5
Non-paralytic ..	65	4				25	3			
Puerperal fever‡	253	27	15	1	2	234	37	10	3	
Scarlet fever ..	1,072	66	149	29	67	1,036	92	201	4	49
Tuberculosis:										
Respiratory ..			135	26				127	33	
Non-respiratory ..			22	1				24	12	
Whooping-cough ..	4,407	374	336	44	60	2,344	104	130	73	98

DEATHS In Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0				1	0		0	
Encephalitis, acute..	0	0				0			1	
Enteric fever ..	0	0	0			0	0		0	
Infective enteritis or diarrhoea under 2 years ..	10	1	2	1		11		2	2	1
Influenza ..	2	0	0	0		3	0		0	0
Measles ..	0	0	0	0		0	1	0	0	
Meningococcal infection ..		0	1			0				
Pneumonia ..	100	15	9	5		118	24		9	8
Poliomyelitis, acute	8	2		0		0	0		0	
Scarlet fever ..		0	0	0		0			0	0
Tuberculosis:										
Respiratory ..	79	5	13	7		93	13	6	2	7
Non-respiratory ..		2	2	0		4	3	1	6	
Whooping-cough ..	1	0	1	0		4	0		0	0
Deaths 0-1 year ..	176	12	31	16		219	30	30	10	12
Deaths (excluding stillbirths) ..	3,985	557	509	141		4,610	683	552	108	153
LIVE BIRTHS ..	7,997	149	921	364		7,661	1140	900	224	401
STILLBIRTHS ..	184	21	23			181	24	16		

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

Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending July 18 (28th week of the year) were as follows: paralytic, 147 (118); non-paralytic, 76 (65); total, 223 (183). This is an increase of 40 compared with the previous week, the figures for which are in parentheses. Districts which have notified 15 or more cases in the year to July 18, with incidences per 100,000 in parentheses, are as follows: Southend-on-Sea C.B., 24 (15.84); Liverpool C.B., 17 (2.15); Hendon M.B., 15 (9.63); Birmingham C.B., 35 (3.15); Coventry C.B., 38 (14.72); and Pewsey R.D.C., 16 (87.77).

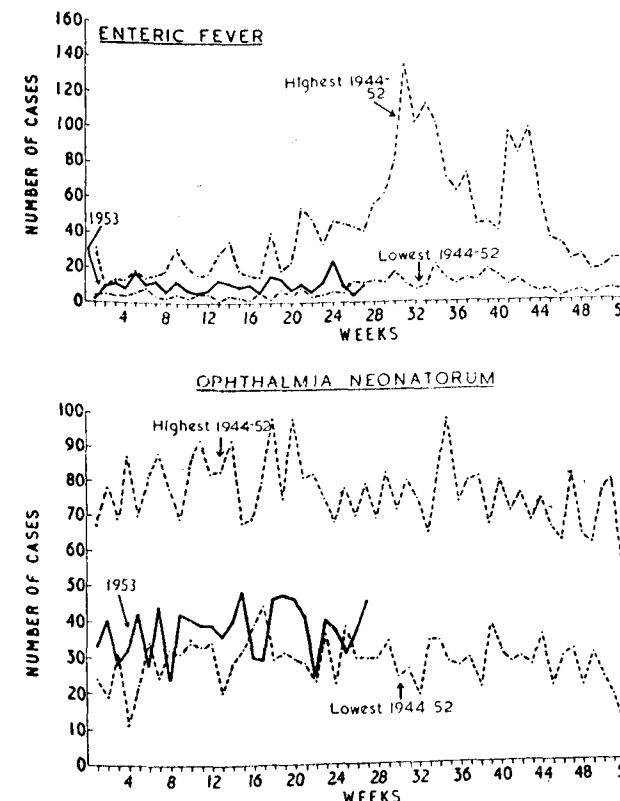
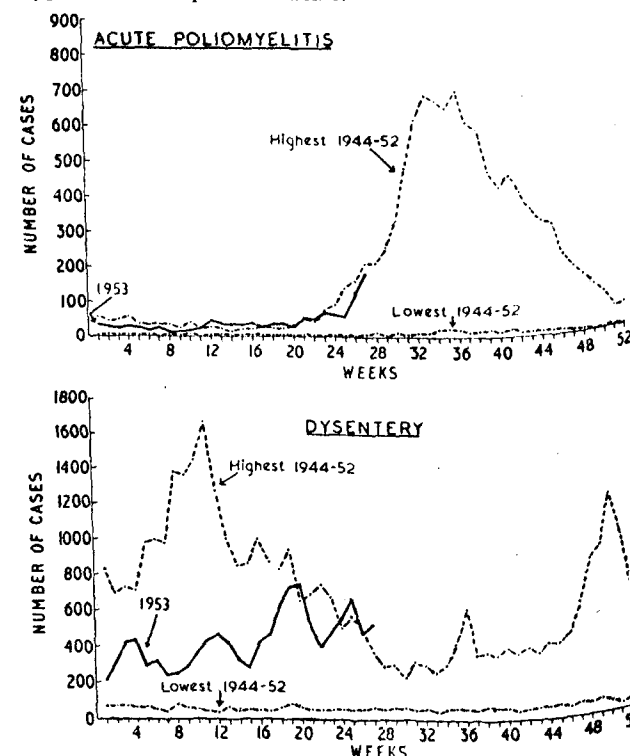
The momentum of the seasonal rise was unchanged during the 28th week. The number of notifications was greater than in the corresponding week of any previous year. A further increase must be expected, and the outlook is not favourable. The ratio of notified paralytic to non-paralytic cases remained constant at about 2:1. New cases were scattered widely, and apart from the outbreak in Pewsey R.D., which appears to be ending, there is no focus of unusual size.

England and Wales Second Quarter

The birth rate, stillbirth rate, and infant mortality rate in England and Wales were slightly higher in the second quarter of this year than in the second quarter of last year. There were 179,464 births, giving a rate of 16.4 per 1,000 population. Stillbirths numbered 4,200, giving a rate of 22.9 per 1,000 total births; and there were 4,441 deaths of infants aged under 1 year, giving a rate of 25.6 per 1,000 related live births. The general death rate was 10.5 per 1,000 population, and there were 114,538 deaths.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ————, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The returns of infectious diseases in England and Wales during the week ending July 11 showed a decrease of 1,106 for measles, from 6,610 to 5,504, and 283 for whooping-cough, from 4,690 to 4,407, and a rise of 57 for acute poliomyelitis, from 126 to 183, and 49 for dysentery, from 476 to 525.

The largest falls in the number of notifications of measles were 225 in Lancashire, from 1,274 to 1,049, 219 in Yorkshire West Riding, from 642 to 423, and 108 in Yorkshire East Riding, from 366 to 258. The largest variations in the returns for whooping-cough were falls of 65 in Warwickshire, from 312 to 247, 63 in Devonshire, from 178 to 115, 59 in Yorkshire West Riding, from 356 to 297, 57 in Staffordshire, from 207 to 150, and rises of 45 in Essex, from 348 to 393, and 42 in Lancashire, from 358 to 400. 1,072 cases of scarlet fever were notified, 6 more than in the preceding week, and no large variation occurred in the local trends. 17 cases of diphtheria were notified, an increase of 3 on the total of the preceding week.

The notifications of acute poliomyelitis were 33 more for paralytic and 24 more for non-paralytic cases than in the preceding week. Half of the increase was contributed by two counties—Warwickshire with a rise of 17 and Lancashire with a rise of 10. The largest returns were Warwickshire 20 (Coventry C.B. 3, Nuneaton M.B. 3, Atherstone R.D. 3), London 19 (Greenwich 3, St. Pancras 3), Essex 19 (Southend-on-Sea C.B. 4), Middlesex 17 (Hornsey M.B. 4, Ruislip Northwood 4), Lancashire 10 (Lytham St. Annes M.B. 4, Blackpool C.B. 3), and Sussex 10 (Worthing M.B. 3).

The largest centres of dysentery were London 109 (Deptford 10, Paddington 11, St. Pancras 28; the remaining 60 cases were scattered through 19 boroughs), Lancashire 100 (Liverpool C.B. 23, Preston C.B. 20, Manchester C.B. 14), Yorkshire West Riding 67 (Heckmondwike U.D. 24, Wakefield C.B. 10), Surrey 45 (Richmond M.B. 24), Norfolk 25 (King's Lynn M.B. 15), Middlesex 24, and Durham 19. 12 further cases were notified in the outbreak in Bedfordshire, Luton M.B., where 251 cases have been notified in the preceding weeks.

Two large outbreaks of food-poisoning were notified during the week—124 notifications in Islington, London,

and 69 notifications in Easington R.D., Durham. 72 further cases were recorded from the outbreak in Lancashire; these cases were spread over 19 administrative areas.

Week Ending July 18

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,018, whooping-cough 4,218, diphtheria 18, measles 4,795, dysentery 380, paratyphoid fever 5, and typhoid fever 4.

Quarterly Return for Eire

The birth rate for the March quarter of 1953 was 21.3 per 1,000 of the population and was 0.5 below the rate for the preceding first quarter. Infant mortality rate was 44 per 1,000 registered births and was the lowest rate ever recorded in a first quarter, being 11 below the rate for the March quarter of 1952. The general death rate was 14.3 per 1,000 and was 0.1 below the rate for the preceding first quarter. 294 deaths were attributed to respiratory tuberculosis and 74 to other forms of tuberculosis; these were 108 and 25, respectively, below the totals for the preceding first quarter. Deaths from infectious diseases included 252 from influenza, 18 from whooping-cough, 8 from measles, and 7 from acute poliomyelitis. Only one death was due to diphtheria. Gastro-enteritis was responsible for the deaths of 51 children under the age of 2 years.

Medical News

College of General Practitioners.—The first annual general meeting of the College of General Practitioners will be held on Saturday, November 14, at 2 p.m. in the Hall of the Society of Apothecaries, 14, Black Friars Lane, London, E.C.4.

First World Conference on Medical Education.—Details of the programme of this Conference (August 22-24) were published in the *Journal* of July 4 (p. 32). All those wishing to attend are advised to register as soon as possible by applying to the secretary of the Local Arrangements Committee, Dr. E. Grey Turner, B.M.A. House, Tavistock Square, London, W.C.1. To help to meet the expenses of the Conference, which are considerable, a registration fee of £4 is payable. Anyone interested in the work of the Conference may register, and registration confers the right to attend all meetings, excursions, and receptions. There will be a reception (6.30 p.m.) at B.M.A. House on August 22, and an excursion to Cambridge (10.30 a.m.) on August 23. On Monday, August 24, the Presidential Address on "The Challenge to Medical Education in the Second Half of the Twentieth Century" will be given by Sir Lionel Whitby in the morning, and the following addresses, also given in plenary session, will be delivered on Monday afternoon: "What is Education?" by Sir Richard Livingstone; "The History of Medical Education," by Professor John F. Fulton; and "Medicine—a Technology or a Profession?" by Colonel S. M. K. Mallick.

The Minister and the Dental Profession.—The Minister of Health, Mr. Iain Macleod, was the principal guest and proposer of the toast of "The Faculty" at the sixth anniversary dinner of the Faculty of Dental Surgery, Royal College of Surgeons of England, on July 17. When he became Minister, he said, one of the things that most needed doing was to improve the personal relationship between the Department, and more particularly the Minister, and the professions concerned with the Health Service. "I am not completely satisfied with the present position in relation to myself and the dental profession," Mr. Macleod went on to urge the best men not to be backward in playing their part in negotiations for the improvement of their profession. "It matters enormously that those whom I meet as representing the professions should be the leaders of those professions." Mr. Macleod declared that he looked forward to the estab-

lishment of a General Dental Council, but one of the difficulties was to find Parliamentary time for the necessary Bill. He ended his speech with a warm tribute to the Dean of the Faculty, Sir William Kelsey Fry. Among the other guests were Sir Cecil Wakeley, P.R.C.S., Sir John Charles, Dame Lillian Penson, and Dr. Bernard Johnson.

Commonwealth Bursaries.—The Royal Society and the Nuffield Foundation are jointly instituting a series of Commonwealth bursaries. Their object is to increase the efficiency of investigators of proved worth by enabling them to pursue research, learn techniques, or follow other forms of study wherever in the Commonwealth the environment is particularly favourable. The bursaries differ from ordinary research fellowships, the main emphasis being on improving the recipients' capabilities rather than on obtaining the solution of a particular research problem. Each bursary will provide for cost of travel and maintenance, but not for a salary as such; bursaries will be tenable for from two to twelve months. For the first five years the scheme will be on an experimental basis. During this period the Nuffield Foundation will contribute £5,000 a year, and the Royal Society will make an initial contribution of £2,500. Later it is hoped that funds may be obtained from other sources, particularly from overseas, to make possible the full development of the scheme. A joint Commonwealth Bursaries Committee has been set up under the chairmanship of Sir Edward Salisbury, F.R.S. It includes two medical members: Sir John Stopford, F.R.S., and Professor G. R. Cameron, F.R.S. Bursaries will be awarded biennially, and application forms (obtainable, with further details, from the assistant secretary, the Royal Society, Burlington House, Piccadilly, London, W.1) must be submitted not later than March 15 and September 15 each year. The bursaries are open to both United Kingdom and other Commonwealth scientists. The first applications will be considered early next year.

Foulerton Research Fellows.—Two physiologists have been appointed by the Council of the Royal Society to Foulerton Research Fellowships. Mrs. P. M. Holton, D.Phil., is to carry out work at the Physiological Laboratory, Cambridge, on chemical transmission in the nervous system. Mr. J. E. Falk, Ph.D., of University College Hospital Medical School, is to investigate the biochemical mechanisms involved in the production of porphyrins and haemoglobin.

School of Medical Photography.—A school of medical photography, provisionally designated the London School of Medical Photography, is being formed as a non-profit-making organization through the co-operation of eight London teaching hospitals. Its aim is to prepare students for the final examination of the Institute of British Photographers in medical photography. The institutions concerned are Guy's Hospital Medical School; St. Mary's Hospital Medical School; the Middlesex Hospital; The Hospital for Sick Children, Great Ormond Street; the Institute of Ophthalmology; the Institute of Orthopaedics; the Postgraduate Medical School of London; and St. Bartholomew's Hospital. Students must have passed the intermediate examination of the Institute of British Photographers; they should be ready for the final examination at the end of four terms. The school opens in October. Inquiries should be addressed to the honorary secretary, Mr. N. K. Harrison, Department of Medical Photography, St. Bartholomew's Hospital, West Smithfield, London, E.C.1.

Rabbits.—The present success of the virus of myxomatosis in controlling rabbits in Australia—it is estimated that in the last three years 80% of the rabbits have been destroyed—has led landowners there to raise a fund in honour of Dr. Jean McNamara, of Melbourne, in appreciation of her long campaign for its use. Dr. McNamara is well known for her work on poliomyelitis, for which she was made D.B.E. in 1935, and it was while working in the United States on a Rockefeller scholarship that she first conceived the idea of using myxomatosis virus for rabbit control. A less happy experience is that of a French doctor who used the virus

to exterminate rabbits on his walled property. According to the *Manchester Guardian*, the doctor is now threatened with prosecution by the State, because the disease is rapidly spreading far beyond the walls of his estate. This is hardly surprising, as the virus is carried by mosquitoes.

"Family Doctor."—The August issue of *Family Doctor* has holiday topics well to the fore. There are articles on swimming, the hazards of picnicking, holiday housekeeping, and "How Hot Can You Get?"—the last giving some account of current research on climatic conditions and working efficiency. James Laver, writing on fashion and health, depicts some formidable corsets and even a machine for tightening their laces. In the Medicine and Health Section, Dr. T. Traherne discusses the causes of suicide, Miss Theodora Alcock advises on left-handedness and mirror writing, Dr. W. Edwards explodes some nature cures, and Dr. Doris Odum tells parents how to bring up their babies the modern way. Constipation, stitch, baldness, and fat children are the subjects of other notes. For the profile, the work of the almoner has been chosen.

Mr. Arthur A. Gemmell was re-elected President of the Royal College of Obstetricians and Gynaecologists on July 25.

Mr. John Foster, senior clinical lecturer in ophthalmology in the University of Leeds, has been invited to deliver the Charles H. May Memorial Lecture before the New York Academy of Medicine in April, 1954.

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 37, No. 8) will be available in a week's time. Issued monthly; annual subscription £4 4s., single copy 8s. 6d.

British Journal of Preventive and Social Medicine.—The next issue will be available in a week's time. Issued quarterly; annual subscription £2 2s., single copy 12s. 6d.

These journals are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, August 3

EDINBURGH UNIVERSITY: FACULTY OF MEDICINE.—At West Lecture Theatre, University New Buildings, Teviot Place (Door 4), 5 p.m., Professor Shields Warren (Harvard): Pathologic Consequences of Total Body Irradiation.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Clarke-Williams.—On July 16, 1953, at Catterick Military Hospital: to Shirley (formerly Hinton), wife of Michael Clarke-Williams, M.B., M.R.C.S., a daughter—Marion Anne.

Cliff.—On July 16, 1953, at County Hospital, Hereford, to Margaret, wife of Dr. Philip Cliff, of Colley Horn, Mordiford, Hereford, a daughter—Pauline.

Dakin.—On July 10, 1953, at Grappenhall Maternity Home, Warrington, to Marjorie (formerly Pennington), wife of E. T. Dakin, M.R.C.S., L.R.C.P., a daughter—Julie Karen.

Edwards.—On July 22, 1953, at Argyll Nursing Home, Darlington, to Laurie, wife of Dr. D. R. Edwards, a son.

Gretton-Watson.—On July 16, 1953, at Chester, to Concetta, wife of Dr. B. G. Gretton-Watson, a daughter—Clare Lilian.

Holden.—On July 22, 1953, at King's College Hospital, Denmark Hill, London, S.E., to Ursula (formerly Stanley), M.R.C.S., wife of Surgeon-Lieutenant P. H. Holden, R.N., a daughter.

Laidlaw.—On July 25, 1953, to Greta (formerly Mair), wife of Dr. Allan J. Laidlaw, Barbourne Road, Worcester, a daughter.

Park.—On July 19, 1953, at 40, Wilbury Road, Hove, to Dr. Emily Park (formerly Smith), wife of Harold Park, F.R.C.S., a daughter.

DEATHS

Mason.—On July 5, 1953, at 14, Gainsborough Gardens, Hampstead, London, N.W., Francis Courtenay Mason, M.S., F.R.C.S.

Morris.—On July 7, 1953, at 19, Oak Road, Woolston, Southampton, Hans, the home of his son, Luther Morris, M.D., of Ashgrove, Brisbane, Australia.

Pringle.—On July 12, 1953, John Pringle, M.D., D.P.H., of Hawkbarrrow, Gosforth, Cumberland, formerly of Whalley Range, Manchester, Lancs.

Riley.—On July 8, 1953, at Nordale, Ben Rhydding, near Ilkley, Yorks. Donald Riley, M.B., B.Ch., aged 52.

Any Questions?

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

Treatment of Congenital Cataract

Q.—A child has greatly impaired vision owing to bilateral congenital cataract, one eye being more severely affected than the other. An operation on the worse eye has been suggested. What is the best age at which to do it? What results may be expected? If unsuccessful, is there any risk to the better eye?

A.—When a child has bilateral cataract dense enough to create a serious obstacle to vision, the sooner operation is done the better. Useful vision is obtainable in a majority of cases, but it is impossible with a dense cataract to give a certain prognosis, because the fundus of the eye cannot be seen in detail until a clear gap is fashioned through the opaque pupil. The risk of damage being done to the other eye by operation on the first eye is only slight. There is some risk of sympathetic inflammation in the second eye whenever any intraocular operation is performed or whenever any perforating injury is sustained. Such a risk is negligible in the face of the alternative—namely, the sight permanently obstructed by cataracts.

Pregnancy after Cancer of the Breast Treated with X Rays

Q.—Three years ago a patient was given x-ray therapy following a radical mastectomy for cancer of the breast (3,600 r to the chest wall and 2,700 r to the axilla). She is now two months' pregnant. Is there an increased chance that the foetus will be deformed?

A.—It is difficult to believe that the ovaries can have received a significant dose of x rays, and it can be confidently stated that the previous disease and its treatment do not increase the risk of malformation of the foetus. A more important consideration in a case of this kind is the question whether pregnancy will activate any remaining cancer cells and precipitate a recurrence of growth. The evidence on this is equivocal, and opinions are divided. Nevertheless, some authorities would regard the risk as being so real as to justify terminating the pregnancy.

Gout in a Boy

Q.—How decisive is the finding of a raised blood uric acid in the diagnosis of gout? A boy of 13 has for the last four years suffered intermittently from a polyarthritides until now presumed to be rheumatoid arthritis. However, three consecutive blood uric acid estimations have been 7.1 mg.%, 8.8 mg.%, and 7.3 mg.%. No tophi are to be seen, and there is no family history of gout. Are we justified, on the basis of these high blood uric acid estimations alone, in regarding this as a case of gout, and, if so, what treatment would be indicated in a boy of this age?

A.—The blood uric acid may be raised in renal failure or when there is excessive nuclear destruction as in leukaemia, but if these conditions are excluded a blood uric acid of over 6 mg. is very strong evidence in favour of gout; it is not unknown for this disease to start in childhood, and to present as a polyarthritides. The onset of chronic symptoms at such an early age would indicate unusually severe disease with a poor prognosis.

If there are acute symptoms, treatment should start with colchicine, 0.5 mg. two-hourly, until there is some relief or until diarrhoea or vomiting supervenes (this may be expected after 3–6 doses). The dosage should then be reduced to 0.5 mg. six-hourly and gradually tailed off during the next

six days. After the first few days, and when the gastrointestinal symptoms have subsided, sodium salicylate should be given four-hourly and the dosage gradually increased to the maximum that can be tolerated. This is likely to be in the region of 3 to 6 g. per day. If the treatment is successful there will be an obvious increase in uric acid excretion, and the blood uric acid should fall to normal levels in a few weeks. The salicylate therapy should then be continued indefinitely, and the colchicine may be repeated if there are further acute episodes. If this treatment is without effect other uricosurics such as probenecid ("benemid") may be tried. Dietary restrictions are of minor importance, though foods with a high purine content, such as liver, kidneys, sweetbreads, and sardines, should be avoided.

A Mouth Like a Parrot's Cage

Q.—What is the reason for thirst and apparent dehydration after the ingestion of alcohol?

A.—There is no satisfactory evidence that alcohol is a diuretic: the diuretic effect of alcoholic beverages is due almost entirely to the water which they contain. Some alcoholic drinks—for example, gin—do, of course, contain volatile oils (such as oil of juniper) which are diuretics, and these will cause a greater output of urine than if an equivalent amount of absolute alcohol had been taken.

The consumption of alcohol is followed by an increase in extracellular fluid over and above that due to the water in the drink; this extra fluid can only have come from intracellular water. A loss of intracellular water is probably the fundamental change which produces thirst, whether it results from reduced water intake, diuresis, sweating, haemorrhage, or the ingestion of alcohol. It gives rise to a cessation of salivary flow, dryness of the mouth, and a consequent craving for fluid.

Lotion for Cleaning Eye Sockets

Q.—In a mission school for blind children in India a number of the pupils have had their eyes enucleated, and the sockets tend to become easily infected. What lotion is recommended for regular use to keep the sockets healthy?

A.—The simplest lotion for eye sockets is normal saline solution. When a socket is slightly inflamed oxyecyanide of mercury lotion in a strength of 1 in 10,000 is often beneficial. The disappearance of inflammation is usually expedited if the patient leaves off wearing an artificial eye for a few days.

Does Atmospheric Pollution Cause Sinusitis?

Q.—Is there any evidence that dirt or fumes in the atmosphere are an aetiological factor in the production of sinusitis? I practise in a colliery district and must have seen some 50 cases of sinusitis last winter, many with a polyp in the antrum. Are certain districts more prone to this affection than others? What preventive measures can be taken to reduce the incidence of sinusitis?

A.—There is no evidence to suggest that pollution of the atmosphere has any great bearing on the incidence of sinusitis. Infective sinusitis starts as a head cold which settles in one or other sinus because either the drainage from the sinus into the nose is not effective or the ciliated epithelium lining the sinus is unable to cope with the inflamed products of the mucous membrane. Sinusitis is prevalent in temperate zones where there are frequent temperature changes, and it is believed that such changes play an important part in the production of head colds. Upper respiratory infections are probably equally prevalent throughout the British Isles, and the main preventive measure in reducing the incidence of sinusitis is prevention of the causal upper respiratory infection. In some subjects obvious defects of nasal architecture, such as a badly deflected septum or unusually large middle turbinates, will require correction.

Cyanides in Industry

Q.—In a factory laboratory one worker is constantly handling a sodium and potassium cyanide powder. What are the risks, and what precautions are advised? Would the wearing of a mask be advisable?

A.—Sodium and potassium cyanide are widely used in industry and, handled with care, are relatively non-toxic. Danger arises when they are heated or acted upon by acids or moisture with the resulting evolution of hydrocyanic acid. They are poisonous, of course, if they find their way to the stomach. In the laboratory, where these substances can be properly stored and where the necessary precautions can be maintained, their handling should not be accompanied by any such risk. They should, of course, be properly labelled to prevent accidental ingestion.

The use of a dust respirator is not indicated, since it would be of no avail against hydrocyanic acid if this were present, and might give a false sense of security which could be dangerous.

Beeswax

Q.—Is the wax from honeycombs harmless to eat? Is it absorbed, and, if so, in what form?

A.—Honeycombs which have been made naturally by bees contain about 4.6% of wax. The wax consists mainly of esters of higher aliphatic alcohols with chains of 26 or more carbon atoms. From the high melting-points of these alcohols, and of their esters, it seems unlikely that they can be absorbed from the intestines when honeycomb is eaten upon bread in the usual way. The experience of bee-keepers confirms this view, and the wax is said to be mildly laxative. There would seem to be more chance of absorption, however, if the honey were used to make biscuits, cakes, or sweets under conditions which would cause the wax to become finely emulsified. From the lack of reports of harm resulting from eating comb honey it seems safe to conclude that the practice is quite safe. Common sense would suggest, however, that it is inadvisable to swallow large amounts of indigestible wax from which most of the honey has drained away. If the wax is absorbed at all it probably passes through the intestinal walls in the form of droplets of unhydrolysed wax; the esters of the higher alcohols are more difficult to hydrolyse than the triglycerides which are the main components of dietary fats. In modern bee-keeping the insects are often encouraged to start making honey promptly by providing them with combs made with paraffin wax. This material would be equally resistant to absorption, but again it might be partially absorbed if emulsified by cooking.

Eggs and Delirium

Q.—A man with acute bronchitis was given nine eggs in milk in 18 hours. He became delirious and walked out of doors in his sleep. He has no known allergy to eggs. Could the delirium be ascribed to the ingestion of so many eggs?

A.—It seems unlikely that the eggs were responsible for the delirium and sleepwalking. This number of eggs was frequently given to patients suffering from a gastric ulcer, and nothing untoward happened. It seems more likely that the acute bronchitis was due to a pneumococcal infection, or may have obscured a consolidation of the lung. It is well known that patients with pneumonia, when very ill and near the crisis, become delirious and may try to get out of bed. They may do some injury to themselves and try to jump out of the window. It is for this reason that the lower half of the windows can be opened only 10 inches (25 cm.) or so in many hospital wards. Nurses are taught that patients with pneumonia must be carefully watched and any attempt to get out of bed prevented, if possible.

Vasomotor Rhinitis and Antituberculous Therapy

Q.—Is vasomotor rhinitis a recognized sequel to combined P.A.S. and streptomycin therapy? It developed four days after the start of a two months' course, and has persisted. What treatment is recommended?

A.—Although sensitivity reactions, particularly in the form of skin rashes, are frequent during combined P.A.S. (para-aminosalicylic acid) and streptomycin treatment, vasomotor rhinitis has not been reported with significant frequency. It would be unusual for any sensitivity reaction to develop as soon as four days after the start of a course of treatment unless, of course, the patient had previously received either of the drugs. Whether or not any unusual symptoms and signs are due to either or both of the drugs can be quite easily determined. As soon as it is clear that the symptoms are persistent, both drugs should be stopped. If the symptoms do not clear up, then they are unlikely to have been due to a sensitivity reaction. If, on the other hand, the symptoms cease, then each of the drugs should be started in turn. In this way the drug responsible for the symptoms can be determined. In nearly every instance it is possible to desensitize the patient to the causative drug by administering first a dose too small to give rise to symptoms, and then progressively increasing this dose day by day until a full dose is being given. Of course, if the test of discontinuing the drugs shows that the vasomotor rhinitis is not due to either P.A.S. or streptomycin, the usual symptomatic treatment should be given. Antihistamine drugs such as mepyramine maleate, 50–100 mg. three times a day, should be used. Even if the condition appears to be caused by one of the drugs, it might be found that the symptoms of vasomotor rhinitis are so well controlled by the administration of a suitable antihistamine drug that the simplest procedure would be to continue with the course of streptomycin and P.A.S. together with the antihistamine.

Multiple Cervical Glands in Children

Q.—What is the cause of the multiple small discrete glands in the posterior cervical region which are so commonly found in rather poorly developed children?

A.—The cause is nearly always infection in the nasopharynx, particularly in the adenoids.

Reactionary Haemorrhage after Antrostomy

Q.—What is the best treatment for dealing with a severe reactionary haemorrhage following an antrostomy?

A.—Severe recurrent haemorrhage following an intranasal antrostomy usually comes from the large blood vessel about half-way along the naso-antral wall, and this is implicated as a rule only when the antral opening has been made rather far back. When the blood vessel causes trouble some hours after operation, the inside of the antral cavity should be cleared of clots by suction, and the antral opening plugged with fibrin foam or gelatin sponge. On top of this it may also be necessary to pack some ribbon gauze around the antral opening, and also in the antral cavity. This is almost certain to stop any recurrence of haemorrhage.

Correction.—It is regretted that Crohn's disease was misspelt in the Refresher Course article on "Indigestion in Childhood" (July 25, p. 197).

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THE EVOLUTION OF BINOCULAR AND STEREOSCOPIC VISION IN MAN AND OTHER ANIMALS*

BY

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Many years ago, on leaving the National Hospital in Queen Square, where I had been house-physician for two years, I began a series of experimental work in Sir Victor Horsley's laboratory in University College on various animals, birds, and reptiles to study the subject of binocular vision and the path of the pupil reflex fibres to light. My results after two years were given in a paper to a special meeting of the Neurological Society in December, 1899, where I showed my microscopical sections of the chiasma in the chameleon, toad, pigeon, owl, rabbit, and cat, demonstrating the Marchi degeneration in the chiasma and optic tracts of the pigeon and rabbit, and in the optic lobes of the pigeon and the pons of the cat, after enucleation of one eye under anaesthesia. In addition, the course of the pupil fibres was suggested by the partial posterior decussation of Meynert's fountain decussation, following wounds of the anterior corpus quadrigeminum. Later on, this work was published (Harris, 1904). I developed the view that the successive improvements in accuracy of vision by binocularity, and finally by stereoscopic vision, were correlated with the importance, indeed the necessity, for certain groups of animals and birds, which live by hunting and chasing other living creatures for food, to acquire good vision.

Thus the shrikes and swallows, the hawks, owls, and eagles required and developed the greatest acuity and accuracy of vision, largely binocular, and amongst mammals the Carnivora developed almost perfect frontal position of the eyes and commencing stereoscopic vision. In the highest group, primates and man improved greatly the scope and accuracy of focusing by stereoscopic vision, but no longer for the purpose of hunting food or escaping from enemies, but in association with the development of the hand—in the monkey and apes mainly for inspection of objects of food seized by the hand; and, finally, in man there was the much greater development of the thumb and the resulting use of the hand in association with good stereoscopic vision for every kind of manual and artistic work. Indeed, foveal acuity of vision has probably diminished in the most civilized races of mankind, though some—the Hottentots, some Indian natives, and the Tierra del Fuegians—are credited with far keener vision than the average white races. Yet the cerebral development of macular vision in man, both in area of cortex and stereoscopic power of brain reception and perception, has without doubt greatly increased.

*A "birthday" lecture given at St. Mary's Hospital Medical School on December 5, 1952.

Stained sections of the chiasma in the chameleon, toad, owl, and pigeon demonstrated that there was total decussation of the optic nerves, while Marchi specimens of pigeon chiasma showed conclusively that the decussation of all the fibres was complete. Similar Marchi specimens of rabbit's chiasma showed that a very few fibres did turn back into the optic tract of the same side, but practically the decussation was total. Neither of the owls survived the operation of enucleation long enough to obtain the osmic acid staining for Marchi degeneration, but the appearance of the cut sections showed that there could be no doubt that the decussation in the owl was as complete as in the pigeon. There was good contraction of the pupils in the pigeon and owl to light shone directly on one eye, but no trace of consensual contraction in the other eye. Birds have voluntary power of contraction of the pupil, so a little care must be taken in testing their pupil's reaction to light, but after doing the test several times the bird gets accustomed to it.

I had a grey African parrot as a pet in those days, and its pupil was much easier to test, owing to the light coloured background. I remember trying to dilate its pupil with a drop of atropine, as I wanted to look at the retina and pecten, but the only result was that it stopped talking for a week. Birds' voluntary power of contracting the pupil is due to their having striated muscle in the iris which is unaffected by atropine. Marchi degeneration in the cat's chiasma showed much more semi-decussation than in the rabbit's, about one-third of the fibres turning back into the optic tract of the same side. In man the proportion of fibres decussating is said to be about seven to five. Consensual contraction of the pupil in the cat is well marked, but is absent in the rabbit owing to the almost total decussation.

Panoramic versus Binocular Vision

Vision in the rabbit and hare is completely panoramic, with no vision directly forwards, and they may even run forwards towards the gun when trying to escape. Several fish and reptiles and many varieties of birds have good binocular vision, though in all of them the decussation of the optic nerves in the chiasma is complete, and in none is there any consensual reaction of the pupil to light, even in the most frontally placed eyes of the owl, which may subtend an angle as wide as 150 degrees in the barn owl, compared with the human parallel optic axes, with the corneae in a horizontal line.

Although the chameleon has complete decussation of the optic nerves, yet it has the power of the most complete convergence of the eyes, with perfect binocular vision when seizing a fly or mealworm. Its eyes are stalked and covered with horny skin except for a small opening in front, at the bottom of which the small black pupil can be seen. When the animal is lively enough in the spring its eyes may be seen to move about quite independently in slow jerky motion, like searchlights; one eye may be pointed directly forwards and the other backwards at an angle of 180 degrees or 90 degrees vertically. If one eye catches sight of a fly or mealworm within range at a distance of a few inches, the eye remains fixed on it, while the other eye is brought round slowly until the two eyes are fixed on the morsel in perfect convergence. Then the mouth slowly opens and the sticky tongue appears; this is then flashed out, taking the grub unerringly, and withdrawn into the mouth. The tongue is not hinged at the front of the lower jaw as it is in the toad, which throws its tongue forward in an arc, as though on a hinge, and the fly or cockroach is gone in a flash, even quicker than in the chameleon's act.

In 1942 a remarkable book was published in America by G. L. Walls on the vertebrate eye, which by his permission I quote from freely in this paper. He states that associated with the perfect convergence of the chameleon's eyes is the highly developed retina, with a central fovea and yellow spot macula, the only animal besides the primates which has a macula; it has 756,000 cones per mm.² in its fovea, which is deeper and even more developed than the human. Walls devotes five pages to the evolution of binocular vision, and these are entirely given up to the question of the fusion of images and the perception of distance, though elsewhere he says, "The hunters tend towards frontality so as to have the best vision of the prey they are pursuing, while the hunted tend to retain laterality of eye position so as to be able to detect an enemy coming from any direction." He does not stress the idea that it is the carnivorous habits of certain reptiles, birds, and animals which have led to the evolution of binocular vision, or that stereoscopic vision has been perfected in the primates, and especially in man, in association with the development of dexterity of the hand for intricate work. In all other respects Walls's book is a mine of information, and my references to types of retinae and foveae are almost entirely quoted from it. I feel so sure, however, that the view of evolution of binocular and stereoscopic vision which I put forward nearly fifty years ago is correct, that I am venturing to discuss it once again.

Acuity of Vision

The marmots, or prairie dogs, have strongly lateral eyes like the rabbit, with little power of lateral movement and with panoramic vision, and for similar reasons, being vegetarian and requiring to avoid their enemies from both sides at the same time. Yet their acuity of vision compares in accuracy with human sight, for their retina, without foveae and containing only cones and no rods, compares in resolving power over its whole area with that of the human fovea. They have yellow lenses, which must mitigate the intensity of full daylight on the cones. On the whole, diurnal animals have a majority of cones in the retina, and pure cones only in the fovea or area centralis, while nocturnal animals have mostly rods; the owl's cones have become much more slender and rod-like in appearance, and the bird has no central fovea, only a temporal one. Many birds have two foveae, central and temporal. Diurnal birds, such as finches,

have mostly cones and comparatively few rods, and in hawks and eagles, and even in the common sparrow, cones are packed very closely in the fovea—400,000 per mm.² in the sparrow—while in the hawk, *Buteo*, no fewer than 1,000,000 cones per mm.² are found. This hawk's retina, with an eye as large as the human, has nearly twice the resolving power of the human fovea, while the visual acuity of some hawks and eagles is at least eight times that of man.

The sharp sight of vultures is well known, because of the great distances from which they can recognize a dying animal. Being carrion feeders on the ground, unlike hawks and eagles, which chase and capture their prey, often on the wing, vultures have no temporal fovea and do not require highly developed binocular vision. Even the shrike, or butcher bird, has much more acute vision than man. A falconer in the Middle Ages used to carry on his saddle a caged shrike which, after the hawk was loosed, would remain excited and fearful as long as the small bird could see the hawk, though long out of sight of the falconer.

A curious structure in the bird's eye is known as the pecten, a comb-like rugose outgrowth from the edge of the optic disk, very vascular and pigmented, but containing no nerve fibres. It is smaller in nocturnal birds, but its function is quite unknown.

Vision may be defined as the reaction to light of certain cells known as visual cells in the retina, which is a cup-shaped structure pushed out from the optic lobe in the brain on each side, consisting of visual cells backing on to an external limiting membrane and a pigment layer, supported externally by a tough fibrous envelope known as the sclera. This is enormously thickened in the whales, so as to make the eye almost immovable. The visual cells consist of rods and cones, the latter being particularly useful in focusing, and are found especially in the area centralis or macula and the fovea, or central vision point in the retina. The fovea in all animals and birds possessing one is avascular, no capillaries intervening between the layer of optic nerve fibres in front and the visual cells at the back of the retina; otherwise the focused image on the fovea would be blurred.

Sphenodon, a New Zealand lizard with nocturnal habits, is the only terrestrial vertebrate with a pure rod retina. Such vision is called scotopic, and cone vision photopic. Rods are more sensitive to light than cones, are distributed especially in the external parts of the retina, and are more useful than cones in dim light. They are bathed on the outside in the visual purple, derived from the pigment layer, which is known as rhodopsin. The retina may be more or less bleached by exposure to strong light for several minutes, but the rhodopsin is gradually reaccumulated on the rods within about half an hour. Vitamin A is a valuable aid to such reaccumulation, and during the late war was made use of in readapting the vision of night-fighters by the administration of halibut oil.

Rays and Vision

The light which strikes the outer layer of visual cells through the inner transparent layers of the retina may be direct light vibrations from a source of light such as the sun, an electric lamp, or a candle. These vibrations of radiant energy are electro-magnetic in nature and have a speed *in vacuo* of about 186,000 miles per second whatever their source. Those vibrations which we call visible light are restricted to a band whose wavelengths vary from about 1/3,000 of an inch at the red end of the spectrum to 1/6,250 of an inch at the violet end. Those rays on the longer side of the red end are the infra-red or heat rays; and still further and with increasing wavelengths are the Hertzian waves of wireless telegraphy which are up to 10,000 metres, or about six miles, in length. Beyond the shorter violet rays are the still shorter ultra-violet rays, with chemical action, and further still come the shorter x rays, gamma rays from radium or from atomic explosions, and finally the cosmic rays, whose wavelengths may be as short as 1/6,000,000,000 of an inch. They have enormous penetrating power, and have been shown to pierce several feet of

lead. All these rays travel at the same speed, and astronomers and physicists assert that nothing can travel faster than light *in vacuo*.

Long wireless waves are constantly travelling all round the world, being reflected downwards by the Heaviside layer in the upper atmosphere and passing perhaps through our bodies without our being conscious of them, but the shorter bands of heat and light rays are arrested by material objects, while the still shorter ultra-violet rays can in quantity damage us, and the still shorter x and gamma rays may be useful in destroying cancer cells but at the same time may be very dangerous. The shortest rays of all, the cosmic rays, we know little about, but it is believed that they reach our galaxy from the almost infinitely distant nebulae. In the upper atmosphere they ionize the air, producing ozone from the oxygen, which shields us from the destructive excess of ultra-violet rays in sunlight. Sir Spencer Jones, Astronomer Royal, in his foreword to a book recently published, *Across the Space Frontier*, comments on the risk from the destructive ultra-violet rays in the unfiltered sunlight that space travellers would encounter.

So it is just one small band, less than an octave, of medium short waves, which have the power of producing light when they strike a solid object and are then reflected into our eyes and retinae, that enable us to see the world around us. These rays entering our eyes are focused by the cornea and especially by the lens to form an inverted image of the object upon the fovea, the central point of vision in the retina. Traversing the transparent layers of optic nerve fibres and ganglion cells and nuclear layers, the rays impinge on the cones in the fovea and on the rods and cones around the macula and the peripheral parts of the retina, and start electric currents. These pass inwards to the layer of nerve fibres and then along the optic nerves, decussating at the chiasma, so that rather less than half turn back into the optic tract on the same side, while the larger remainder cross over to the opposite side, the stimuli in each case reaching the two external geniculate bodies, where the impressions from both retinae are laid over each other alternately, thus laying the foundation of stereoscopic vision. Thence the optic radiations carry the stimuli to the visual cortex in the two occipital lobes on the inner side around the calcarine fissure; lower retina to lower cortex, and upper retina to upper cortex. Thus the upper halves of our total visual field are perceived by the lower half of our visual cortex, and the lower visual field by the upper visual cortex. That this is so is proved by the fact that a lesion of the upper lip of the calcarine cortex and the cuneus above produces a blind area or scotoma in the lower visual field, and a lesion of the lower calcarine area and lingual lobe causes a scotoma in the upper half of the visual field.

Now comes the difficulty. We know from the optics of the eye that the image of any object seen is inverted on the retina. Why then do we see objects in their correct position, and not upside down? There is no known anatomical explanation of this, and so we must assume that there is some psychological reversal of the visual impression after it has reached the visual cortex. This reversal of the retinal inverted image is not a monopoly of the human brain, but must apply to all the lower animals, birds, reptiles, and mammals whose lenses focus on the retina in the same way as ours. It has been suggested that the baby gradually learns from experience, but a day-old foal will nuzzle his mother in the correct manner from the start without any teaching or experience, so it must see its mother the right way up.

A few instances have been reported of young children aged about 6 who, after an illness such as measles, or a head injury, or even after atropine has been put in the eye, may for several weeks see all test letters upside down and may draw objects such as houses and people in the inverted position. Mirror writing, which comes naturally to some children, is due to a somewhat similar process of psychological inversion.

Evolution of Retina

The most primitive light receptor is a spot of black pigment as is found in a unicellular microscopic animal, *Pouchetia cornuta*, or in the pigment in the surface epithelium of the earthworm, where light may cause chemical changes. The first approach to an actual eye is probably that of the limpet, *Patella*, in which a special layer of cells line the bottom of a depression in the skin. A further advance is the pin-hole camera type of eye in the nautilus; then, more elaborate and with focusing lens, the ocellus of the scorpion; then the snail, *Murex*, with a covering cuticle or cornea; and, lastly, the most highly organized of the pre-vertebrate eyes, that of the octopus and decapods, such as *Sepia* and *Loligo*, the cuttle fish, which have retina, vitreous, and spherical lens, with focusing power of moving the lens forwards or backward from the cornea, but very little, if any, binocular vision. These cuttle fish require highly organized and rapid variations of focus as they travel at speed over varying coloured backgrounds of sea-bed, so as to co-ordinate by their nervous reflexes the changing colours of the skin. Though these molluscs have such a highly developed eye, comparable to that of the higher mammals and human beings, the structure of their optic nerves and their central connexions show no evidence of binocular or stereoscopic vision, and there is no decussation of the optic nerves, which pass direct into the lobes of the supra-oesophageal ganglia, a primitive brain.

In passing, I might comment on the fact that the squid and the octopus have anticipated Sir Frank Whittle by many millions of years in their discovery of jet propulsion, with the difference that their method of movement is backwards, or retropulsion. At the same time they have the power of hiding from an enemy by ejecting from the ink sac into the jet a cloud of dark brown pigment, hence the name *Sepia*, or, as the fishermen call it, the pen-and-ink fish. They are, by the way, extremely good eating. It is remarkable that the order Mollusca includes one of the most primitive eyes in the limpet and one of the most highly developed in the cuttle fish.

Varieties of Retina

The vision of all vertebrates may be classed as either diurnal or nocturnal. The latter will have retinae rich in rods, which are more sensitive to dim light than cones. Diurnal vision requires numerous cones, which give clarity of images with focusing in good light, so the foveae of diurnal vertebrates are pure cone. It is not only in relative numbers but also the relative amount of rod or cone substance that is important. This is brought about by an actual increase in size of the eyes, as in hawks, eagles, owls, the larger mammalia, primates, and man. Most birds, being active by day, have retinae rich in cones, but many animals require retinae of a mixed type and rich in rods—such as the Carnivora, wolves, lions, tigers, leopards, and foxes, as many a country farmer has reason to regret on finding his hen-roosts depleted in the morning. Large eyes in the Ungulata (horses and oxen), apes, and man allow of great numbers of rods to be interspersed among the cones without diminishing diurnal vision, while increasing their nocturnal powers in twilight and moonlight; thus man and the Carnivora especially are able to stay up and pursue their gangster business after the birds have gone to bed.

The cone is said to be the older of the two visual cells, and is of special value for focusing and sharp definition, though less sensitive in dim light than the rods. The human fovea is pure cone, but outside the macula rods outnumber the cones by 20 to 1. This greater sensitivity of the rods is demonstrable when looking at a faint star. If you look directly at it the star seems to disappear, but reappears on looking just to one side of it. The belt of Orion is a good test for this point. Or try the brightest star in the Pleiades, Alcyone, who with her six sisters, daughters of Atlas, were chased for five years by the hunter Orion and his dog Sirius, the brightest star in our sky, until Zeus saved them by translating them all to the heavens above.

Teleostean, or bony fishes, are peculiar in having very variable thicknesses of retinae, with twin cones as well as single ones. The eel has 3,000,000 rods per mm.² which is surprising, for its habitat in adult life in fresh-water lakes and canals would not seem to call for a very sensitive retina. The life story of this fish is altogether remarkable. When the adult after some years feels the urge to migrate its eyes grow enormously in size, the fish becomes silvery, makes its way down the streams to the sea, and thence across the ocean to the clear Sargasso Sea in the West Indies. Here they breed, and the adults then die, while the young elvers grow to a few inches in length and then slowly make their way back across the ocean to the estuaries and rivers whence their parents came, and ultimately grow to adult form in the ditches, lakes, and canals whence their parents migrated.

Vision in Deep-sea Fish

The more numerous the rods are in a retina the more sensitive is it to light, and the rods become greatly elongated and slimmer, so that greater numbers can be packed in the same space. This is found in the retinae of deep-sea fish, which dwell at the depth of a mile or more and live in Cimmerian darkness. They never see anything but the photophores or phosphorescent lamps carried by friends or enemies. This luminescence of deep-sea fish is produced by bacteria in tiny tubules in the skin, and this light the fish can conceal at will. About 96.5% of all deep-sea creatures are luminous. It has been claimed that some of them have as many as 25,000,000 rods per mm.² of retina. Some have tubular eyes, fixed in their sockets and immovable, as in the owl, but placed parallel for good binocular vision, others have the eyes fixed for upward vision.

Some freshwater fish have partial binocular vision, for a trout can take a fly quickly on the surface of the pool. It is, however, but an amateur at the job compared with the archer-fish, *Toxotes jaculator*, which can spit a thin stream of water from beneath the surface to hit and bring down a fly in the air several inches above the water. It has a narrow binocular field, but no fovea. As Walls remarks, "If his shooting depends on his sight of the fly in air when seen from under the surface, he must have a truly trigonometric range-finder in his brain to cope with the ever varying distortion of angles, size and distances." If the water is smooth a fish can see out of the water anything subtended by an angle of slightly greater than a right angle with his eye. A person on the bank would look like a tiny doll, which would enlarge the nearer it approached the surface.

Dryophis, the East Indian long-nosed snake, has good binocular vision, due to its having a temporal fovea. It is one of the only two genera that have a fovea, has the sharpest sight of all snakes, and is a most accurate judge of distance. Its pupil is shaped like a keyhole and is placed very laterally on the head, which slopes sharply forwards to its pointed nose, making its view quite unobstructed for good binocular vision.

Carnivorous Birds

Though many birds have two foveae, central and temporal, the owl has only a temporal fovea. The barn owl has the most frontally placed eyes of all birds, with a visual angle of about 150 degrees, compared with the human parallel eyes at 180 degrees. Its retina, being adapted for nocturnal vision, has comparatively few cones but mostly rods, except in its temporal foveae, with which its marked binocular vision enables it to focus and seize the little voles and field mice that are its usual prey. Owing to the owl's nocturnally adapted vision, if it is caught out in the open daylight it is partly blinded by the strong light and is apt to lose its way, and may get mobbed by small birds. Its eye is partly tubular in shape and is quite immovable in its socket, but to compensate for loss of ocular movement the owl has the extraordinary power of rotating its head on its neck to an angle of 270 degrees, or three-quarters of a circle.

Fish-eating Birds

The cormorant, *Phalacrocorax*, has the most powerful accommodation of all birds for compressing the lens by the ciliary muscle. Its lens, which is as soft as the turtle's, can be compressed into a pear shape giving an accommodation power of 40 to 50 dioptries, so essential in following his prey under the water. The gannet, *Sula bassana*, has only central foveae, and so cannot focus its distance when diving from a height into the sea after a fish. This has been proved by fastening a fish on a floating board, when the bird has been seen to transfix the board with its beak. The kingfisher has both central and temporal foveae. It generally dives into a stream from a perch above a pool, having focused a fish beneath the water with its central fovea, but the moment its head is beneath the water it must change its focus to its very external temporal fovea, using good binocular vision in this way as it spears the fish with its pointed bill. The swallow too requires the greatest accuracy in focusing power for catching flies and chafers at speed on the wing.

Many insects, especially the dragon-fly, and some Crustacea have round or oval protruding compound eyes, built up of conical-shaped lenses fixed with their bases against a smooth membrane or cornea, so that vision of objects behind the fly or lobster is possible. Anyone who has tried to stalk a fly from behind must often have noticed this point for himself.

Colour Vision

Colour vision has been demonstrated in fish, reptiles, and birds by training them to take food from different coloured containers. Coloured objects reflect only those coloured rays which we see, absorbing all the rest of the rays of the spectrum. Many street lamps, though excellent illuminants, are very poor in red rays, though rich in green and blue; consequently at night our hands and faces will appear corpse-like in hue, as there are no red rays in the light that illuminates them.

For many years the Young-Helmholtz trichromatic theory—red, yellow, and blue, or red, green, and violet—disputed pre-eminence with Hering's view of three colour substances in the retina, white-black, red-green, and yellow-blue. There are seven primary colours in the spectrum—red, orange, yellow, green, blue, ultramarine-indigo, and violet—and Granit has suggested that there are seven different receptors in the retina, one for each primary colour. This theory has been further developed by Hartridge as a polychromatic theory, which seems likely to oust the older theories, neither of which explains various forms of colour-blindness, which can be satisfactorily explained by the polychromatic theory.

Some brilliant effects of colour, such as the vivid green of some beetles' wings and the coloured eyes of peacocks' feathers and of butterflies' wings, are due to excrescences on the material of the wings acting like a diffraction grating, a piece of plate-glass engraved by a diamond with very close parallel lines, over 12,000 to the inch. These fine lines at their edges break up white light into its spectral colours, and it would be just as useless to try to extract coloured substances from the peacocks' feathers or butterflies' wings as it would be to do so from a rainbow.

Conclusions

Hitherto we have traced the development and value of binocular vision as an assistance to carnivorous fish, reptiles, amphibia, and birds in catching their prey. When we examine the vision of mammals the same and increasing value of binocular vision and frontal placing of the eyes is seen in the Carnivora as compared with the browsing and grass-eating animals, which have panoramic vision and almost total decussation of the optic nerves. The semi-decussation of the nerves in the

Felidae and other Carnivora now introduces an additional element of value—namely, stereoscopic vision, by which I mean that the images from both eyes are now beginning to be laid over one another alternately in the visual centres, first, in the external geniculate bodies, and thence via the optic radiations in the calcarine and neighbouring cortex. This factor doubtless increases the accuracy of fusion of images in depth.

Development of the Hand and Thumb in Co-ordination with Stereoscopic Vision

In the higher mammalian group of primates and man the importance of catching living food has disappeared, as apes and monkeys are mostly fruit eating, and man also is largely fruit eating and agricultural. There is now a more important reason for the development of stereoscopic vision of the highest type, in the increasing importance of the hand in seizing objects for inspection, and for important manual work of all descriptions requiring accurate vision. No one could watch the monkeys in the outdoor cages at the Zoo without noticing how they use the hand and vision in co-ordination for receiving and inspecting the morsels offered to them. Though improvement in vision for hunting animal food is no longer necessary, the human hand is an immense improvement on that of the monkey, chimpanzee, or gorilla—in the development of the thumb and thenar muscles in proportionate strength and the power of opposition of the thumb to the other fingers. By this improvement the value of the hand as a working tool acquires much greater delicacy of movement and co-ordination with vision in its manifold uses of building and of manufacturing tools, objects of vertu, and works of art of every description, as exemplified by a Michelangelo or a Raphael in sculpture and painting, or a Cellini in gem making. In these arts the closest co-ordination of eye and hand is essential, but with musical instruments vision plays little part in the marvellous execution of a Paganini or an Abbé Liszt. Here the ear and memory, and the intensity of practice, take the place of vision.

The monkeys and apes have concentrated on developing all four limbs with four hands, as *Quadrupana*, and the South American monkeys have added even a fifth "hand" in their prehensile tail, thus making an ideal machine for tree-climbing and swinging from branch to branch, and enabling them to travel long distances along the upper regions of the primeval forests without danger from carnivorous enemies on the ground. The offshoot, man, has concentrated on his fore-limb only, and by hand and vision combined—with increasing brain development, the acquisition of speech, and the discovery of fire, of agriculture, firearms, steam power, electricity, the telephone, the internal combustion motor, and, lastly, the means of flying, in ever-hastening speed of invention—has gradually developed from his doubtful position as a cave man to his present supremacy in the living world.

We have yet to see whether the most recent and most powerful invention, atomic fission, will be harnessed for peaceful production of power for all the nations, when all the coal and oil have been used up, or whether it will lead to the greatest means of destruction of civilization in history.

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AUREOMYCIN, CHLORAMPHENICOL, AND TERRAMYCIN IN OPHTHALMOLOGY

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The place of the sulphonamides and of penicillin in ocular infections mainly due to Gram-positive organisms, and of streptomycin in infections mainly due to Gram-negative organisms, is now well established. None of these agents has, however, proved of much use in virus infections, except that the sulphonamides are valuable in the treatment of trachoma and in inclusion blennorrhoea, with penicillin almost as effective in the latter infection. The newer antibiotics with their alleged efficacy over a wider range of viruses offer the possibility of therapeutic agents in ocular infections which are due to viruses and are not readily controlled. Outstanding among these are dendritic ulcer, disciform keratitis, epidemic keratoconjunctivitis, and herpes ophthalmicus. Dendritic ulcer of the cornea, a not uncommon condition, shows varying severity and a tendency to frequent relapses. Disciform keratitis, with its dense interstitial infiltration, generally leads to much loss of vision from the resultant interstitial fibrosis. Ocular complications of herpes ophthalmicus, which include a variety of corneal reactions, iridocyclitis, both active and quiescent, and episcleritis, as well as destructive corneal ulceration, are serious considerations. Epidemic keratoconjunctivitis is the least significant from the point of view of resultant damage, but its prolonged course, marked symptoms, and occasional sequels of dendritic ulceration and disciform keratitis, as also the frequency with which it occurs during epidemic periods, present problems of some magnitude. Evidence for the virus origin of these affections is best in herpes ophthalmicus, and almost as definite in dendritic ulceration and in disciform keratitis; the virus origin of epidemic keratoconjunctivitis is less definitely established. Whilst there is little doubt that the first three of these affections are due to a virus of the herpes group, such little as is known of the morphology of the virus of epidemic keratoconjunctivitis suggests that it has some affinity to the virus of trachoma. The assumption that viruses are responsible for a variety of other nondescript corneal and iris reactions has as yet little support.

In the present study an attempt has been made to assess, experimentally and clinically, the value of the different modes of administration of aureomycin, chloramphenicol, and terramycin. The difficulties in establishing experimental virus lesions in animals on which these agents could be tested have precluded any experimental assessment of these drugs. We have had to rely instead on clinical observations.

Aureomycin

Experimental Studies

Intraocular Levels on Systemic and on Subconjunctival Administration.—Preliminary findings in the rabbit gave the following tentative results. (1) Intramuscular injection (100 mg.): No aureomycin could be demonstrated in the aqueous, vitreous, and cornea after two and four hours, except for one reading of 0.8 µg./ml. in the aqueous of one rabbit. (The blood level was adequate at two hours.) (2) Subconjunctival injection (10 mg.): At one and a half and two and a half hours there were tangible levels in the aqueous (2 and 1.25 µg./ml. respectively) and in the cornea (10 and 20 µg./g. respectively). The levels in the vitreous were lower (0 and 0.5 µg./ml. respectively).

Using a plate diffusion method, with *B. subtilis* as the test organism, the results recorded in Table I were obtained. It will be seen that levels reached with aureomycin when

TABLE I.—Aureomycin Hydrochloride: Concentrations in the Aqueous, Vitreous, and Cornea of the Rabbit Reached by Different Dosages and Methods of Administration (Test Organism: *B. subtilis*)

Mode of Administration	Time in Hours	Aureomycin Levels (µg./g. of Tissue)			
		Blood	Aqueous	Vitreous	Cornea
Intramuscular injection: 200 mg.	1	0.5	<0.2	<0.2	<0.3
	2	0.5	<0.2	<0.2	<0.3
	4	0.3	<0.2	<0.2	<0.3
Oral: 200 mg.	1	4.0	1.8	<0.1	1.4
	2	2.9	<0.1	Tr.	<0.3
	4	2.5	Tr.	Tr.	Tr.
	4	2.0	<0.3	<0.3	—
	6	Tr.	<0.3	<0.3	<0.3
	6	Tr.	<0.3	<0.3	<0.3
Subconjunctival injection: Crystalline 50 mg.	1	<0.1	<0.5	<0.5	11.8
	2	0.1	<0.5	<0.5	1.3
	4	<0.1	0.56	<0.3	>25.0
	6	Tr.	Tr.	<0.3	27.3
	15½	<0.1	Tr.	<0.3	33.7
	15½	<0.1	Tr.	<0.3	33.7
Crystalline micronized: 20 mg.	1	0.8	3.8	<0.5	<1.0
	2	<0.1	1.1	0.5	3.3
	4	<0.1	0.8	<0.5	1.0
	6	2.1	<0.5	<0.5	20.7
	4	<0.1	<0.4	<0.3	5.0
	4	<0.1	<0.4	<0.3	5.0

given intramuscularly, or orally, were considerably higher in the blood than in the aqueous, vitreous, or cornea. It would therefore seem that the systemic use of aureomycin encounters the same difficulties as were observed with penicillin and streptomycin. The subconjunctival route, which proved so effective in the older antibiotics, has, however, distinct limitations with aureomycin, for the drug is highly insoluble—some 0.02 mg./ml., and this is not increased substantially even if the solution is buffered with sodium bicarbonate. As micronized crystalline aureomycin was available an attempt was made to inject larger quantities of the agent in fine suspension subconjunctivally, and a fairly easily injected suspension containing 20 or even 50 mg. per ml. can be prepared. But such suspensions brought difficulties of their own. In the first place, even when buffered these suspensions are inclined to be irritating, and in the experimental rabbit the more concentrated suspensions tended to produce transient corneal haze and other symptoms of irritation. Secondly, and more significantly, these suspensions were not apparently absorbed into the eye but tended to form a cheese-like deposit subconjunctivally with necrosis of the overlying conjunctiva, so that even after eight days most of the suspension could be scraped away mechanically. As can be seen from Table I, even these extreme measures led to disappointing levels of concentration in the aqueous and vitreous. In fact, there is some suggestion that the smaller, and presumably less irritating, doses give rather better intraocular levels.

The use of aureomycin is therefore beset by two considerable difficulties: systemic administration gives low intraocular levels, while subconjunctival injections are limited to small doses, with resultant low levels of intraocular concentration.

Clinical Studies

Aureomycin, given as subconjunctival injections of 10 mg., was used in 15 cases: in seven fresh cases of disciform keratitis and two cases of dendritic ulcer it was given twice at intervals of five days, in four cases of "superficial punctate keratitis" and two cases of epidemic keratoconjunctivitis it was given once. Ointment of 0.1%, generally at two-hourly intervals, was used in 10 cases—two being of dendritic ulcer, two of herpes ophthalmicus with corneal involvement, five of epidemic keratoconjunctivitis, and one of chronic blepharitis in a patient sensitive to nearly all treatment. The results were almost consistently poor. The promise of a good result obtained in the first case of disciform keratitis treated by subconjunctival injection was not fulfilled in further observations. The only positive results in this series were symptomatic relief within three to five days in cases of epidemic keratoconjunctivitis treated by ointment, though the corneal staining persisted; and a fairly good response to blepharitis in a patient who had proved intolerant to other forms of treatment.

We have no experience of the use of aureomycin in trachoma and inclusion blennorrhoea: the poor results obtained with the herpes group of ocular infections and the equivocal results with epidemic keratoconjunctivitis do not exclude the possibility of good results with the large-sized viruses responsible for trachoma and inclusion blennorrhoea, or in infections due to bacteria insensitive to sulphonamides and penicillin.

Chloramphenicol

Experimental Studies

With a plate diffusion method, using *Shigella sonnei* as the test organism for assay of the antibiotic concentration in the tissues, trials gave the following results in the rabbit. (1) Intramuscular injection of 250 mg./kg. body weight: the levels in both the blood and ocular tissues at two and four hours were nil or negligible. (2) Oral administration of 375 mg./kg. body weight: the blood levels at two hours in two animals were adequate (10 and 20 µg./ml.). The levels in the cornea were nil; in the aqueous 5 and 15 µg./ml., in the two animals respectively; and 0 and 10 µg./ml. in the vitreous. At four hours all levels were nil.

As intramuscular injection looked unpromising, fuller studies were confined to assessing the relative value of oral administration and subconjunctival injection. The results are shown in Table II. The first section of this table shows that the intraocular levels of concentration of chloramphenicol compare unfavourably with those reached in the blood when 500 mg. of the drug is administered orally to the rabbit. These results suggest that the oral use of chloramphenicol is not likely to give adequate concentrations in the eye. Subconjunctival injections of chloramphenicol met with the same initial difficulty as in the case of aureomycin. Chloramphenicol, too, is highly insoluble (2.5 mg./ml.), but it has the advantage over aureomycin that it did not prove irritating when 50 mg. was injected subconjunctivally as a suspension. There were not the same irritative reactions in the cornea, nor any necrosis at the conjunctiva. Particles of chloramphenicol were, however, too large for a suspension to be readily injected, and again micronized chloramphenicol proved better. Several types of micronized suspensions were obtained, and it was found that the 15% chloramphenicol suspension in 1:10,000 benzmethonium chloride ("phemeride") could fairly readily be injected in quantities up to 1 ml. without irritation. The intraocular levels obtained in the rabbit with 1 ml. of such suspension injected subconjunctivally are shown in the second section of Table II. It will be seen that the aqueous levels in particular are much higher than those obtained from oral administration of 500 mg. The effect of adrenaline on these levels is seen in the third section of the table. The injection of the suspension in 0.1% adrenaline leads to

TABLE II.—Chloramphenicol: Concentrations in the Ocular Tissues of the Rabbit Reached by Different Dosages and Methods of Administration (Test Organism: *Shigella sonnei*)

Mode of Administration	Time in Hours	Chloramphenicol Levels (µg./g. of Tissue)						
		Blood	Aqueous	Vitreous	Cornea	Lens	Ant. Tissues	Post. Tissues
Oral, 500 mg.	1	56.5 21.7	2.0 6.85	15.7 5.64	10.0 2.56	<2.0 —	19.5 10.5	33.3 12.6
	2	11.2 20.7	6.31 6.12	7.93 10.25	10.41 —	<2.0 —	5.0 12.12	6.78 13.66
	4	0.86 <1.0	2.45 <1.0	2.40 1.68	<2.0 <3.0	<2.0 —	<2.0 <2.0	<2.0 <2.0
	6	<1.0	<1.0	<1.0	<0.3	—	<2.0	<2.0
	1	1.7 1.99	25.0 34.0	2.5 <2.0	— 54.3	<2.0 <2.0	9.9 99.2	ca. 25.0 41.4
	2	3.35	9.54	18.4	—	6.0	56.0	<40.0
Subconjunctival injection (one eye) of 1 ml. of 15% suspension of the micronized base	4	Trace <1.0 <2.0	4.26 2.5 <2.0	4.75 <2.0 <2.0	6.52 — —	<3.0 <2.0 <2.0	9.99 <2.0 <2.0	3.97 6.28 <2.0
	6	<3.0	3.72	4.87	4.52	<3.0	<3.0	<3.0
Subconjunctival injection (one eye) of 1 ml. of 15% suspension of the micronized base in 0.1% adrenaline	1	5.34 <1.00	28.8 <5.0	22.0 <3.0	163.0 —	<3.0 <3.0	129.0 17.25	53.2 <5.0
	2	<1.0 3.65	<3.0 61.0	<3.0 11.0	33.7 195.0	<3.0 <3.0	13.8 179.0	32.4 127.0
	4	<1.0 ca. 1.0 Trace	<2.0 <5.0 34.9	<3.0 <2.0 3.24	12.2 30.25 40.0	<3.0 <3.0 <3.0	18.4 27.5 48.4	27.9 <5.0 77.8
	6	<1.0 0.77 <3.0	<2.0 41.2 11.2	<3.0 <2.0 <3.0	24.1 148.0 —	<3.0 <3.0 <3.0	16.5 58.4 6.46	10.2 3.0 10.5

higher and more consistent levels—a finding reminiscent of the observations with penicillin and streptomycin.

Apart from subconjunctival injections, chloramphenicol was also available in the form of drops 0.5% and ointment %, both of which were well tolerated by the experimental rabbit.

Clinical Studies

Chloramphenicol was used in 72 cases, distributed over the following groups: (1) 29 cases treated with ointment %, generally at two-hourly intervals—9 being disciform keratitis, 6 "superficial punctate keratitis," 2 neuroparalytic keratitis with hypopyon, 3 "chronic follicular conjunctivitis" with acute subjective symptoms, and 9 epidemic keratoconjunctivitis; (2) 28 cases treated with drops 0.5%, generally at two-hourly intervals—2 being "superficial punctate keratitis," 8 dendritic ulcer, 1 neuroparalytic keratitis with hypopyon, and 17 epidemic keratoconjunctivitis; (3) nine cases treated with subconjunctival injections of 15% suspension, generally 0.5 ml. with adrenaline—3 being disciform keratitis and 6 dendritic ulcer.

In addition four cases of herpes ophthalmicus and one case of dendritic ulcer were treated by oral administration combined with the use of ointment locally, and one case of post-operative infection was treated intensively by different methods as indicated below.

Apart from the striking exception of epidemic keratoconjunctivitis, the results with drops or ointment were almost consistently poor for disciform keratitis, dendritic ulcer, and the other presumed virus infections. The diagnosis of epidemic keratoconjunctivitis was not made unless the typical picture of hyperaemic conjunctiva, watery discharge, enlarged preauricular nodes, and superficial punctate staining of the cornea were all present. All the 26 cases treated responded well to either ointment or drops; among these were eight cases that had previously been treated unsuccessfully by other methods. Cases of "superficial punctate keratitis" without the other components of epidemic keratoconjunctivitis did almost uniformly badly.

The disappointing results from drops and ointment in dendritic ulcer and disciform keratitis led to the use of subconjunctival injections in six cases of dendritic ulcer and three of disciform keratitis. The subconjunctival injections were generally 0.5 ml., or rather more, at daily intervals for three or four days. No improvement was obtained.

That subconjunctival injections of chloramphenicol may, however, have a definite, even if limited, place in ophthal-

mology is suggested by the isolated case of post-operative infection treated by this method.

A woman aged 81 was found to have an infected wound with the beginning of a hypopyon at the first dressing 48 hours after a cataract extraction. Subconjunctival injection of 500,000 units of penicillin and a similar dose intramuscularly were given, and a smear for bacteriological examination was taken. This treatment was continued for three days, the eye steadily becoming worse. The bacteriological report showed the presence of pneumococci which were resistant to sulphonamides, penicillin, and streptomycin but sensitive to aureomycin and chloramphenicol, and *Micrococcus tetragenus* which was sensitive to streptomycin and chloramphenicol. Chloramphenicol in ointment form was given three-hourly for three days without result. It was then supplemented by oral administration for two days more. At this stage the hypopyon had increased to almost three-quarters of the anterior chamber, and subconjunctival injection of chloramphenicol with the addition of 2 minims (0.12 ml.) of adrenaline was instituted. A marked improvement had occurred by the following day, and within another 24 hours the hypopyon was barely visible. In all, four injections were given at 24-hourly intervals, with chloramphenicol ointment 1% four-hourly. A fairly good red reflex could be obtained ophthalmoscopically on the third day, and the subsequent course was uneventful. Six months later vision with correction was 6/12.

Terramycin

Experimental Studies

Terramycin, like the other two agents, is largely insoluble in water, the maximum solubility of the terramycin base being 0.25 mg. per ml. Micronized terramycin is not readily taken up in suspension. Subconjunctival injections containing a suspension of more than 20 mg. are not tolerated, as there is marked injection of the eye and opacification of the cornea.

Administration by the subconjunctival route is therefore of limited value. As can be seen from Table III, the intraocular levels of concentration reached by various routes were disappointing.

(a) **Oral Administration.**—With doses of 100 mg., the serum and intraocular levels were poor at one and at three hours.

(b) **Intravenous Injection.**—With the same dose the serum level was high, but the intraocular levels, though better than on oral administration, were low.

(c) **Intramuscular Injection.**—Whether terramycin hydrochloride or micronized terramycin was used, doses of 100 mg. once more gave low intraocular levels.

TABLE III.—*Terramycin: Concentration in Ocular Tissues of the Rabbit reached by Different Dosages and Methods of Administration (Test Organism: B. subtilis)*

Mode of Administration	Time in Hours	Terramycin Levels ($\mu\text{g./g.}$ of Tissue)						
		Blood	Aqueous	Vitreous	Cornea	Lens	Ant. Tissues	Post. Tissues
Intramuscular: Terramycin HCl, 100 mg. in 1 ml.	1	2.1 0.89	3.2 2.3	<0.5 <0.5	<2.5 <2.5	<1.5 <1.5	<2.5 <2.5	<2.5 <2.5
Intramuscular: Micronized base, 100 mg. in 1 ml. suspension	1	0.964 0.47		2.07 0.95	13.0 13.4	2.70 <1.5	6.00 4.19	20.2 1.45
	2	1.44 1.12	<0.48 <0.48	<0.5 <0.5	6.00 <1.5	<1.5 <1.5	8.69 1.50	2.18 <1.5
Oral: Terramycin HCl solution aq., 100 mg. in 5 ml.	1	<0.5 <0.5	2.83 1.37	<0.5 <0.5	<1.5 <1.5	<1.5 <1.5	<1.5 <1.5	<1.5 <1.5
	3	<0.5 <0.5	<0.5 <0.5	<0.5 <0.5	<1.5 <1.5	<1.5 <1.5	<1.5 <1.5	<1.5 <1.5
Intravenous: Terramycin HCl buffered, 100 mg. in 1 ml. water	1	37.9 35.6	<2.5 <2.5	<2.5 <2.5	<2.5 2.50	<2.5 <2.5	5.68 9.76	10.0 5.01
	2	47.7 37.7	<2.5 <2.5	<2.5 <2.5	3.36 4.82	<2.5 <2.5	5.52 7.32	4.78 10.2
Subconjunctival: Terramycin micronized base, 100 mg. in 1 ml. suspension	1	<0.4 <0.4	3.14 1.04	1.5 <0.4	<2.0 <2.0	<1.2 <1.2	6.56 12.3	23.8 10.5
	2	<0.4 <0.4	4.4 1.39	<0.4 <0.4	<2.0 <2.0	<1.2 <1.2	7.4 <1.2	7.9 <2.0
	4	<0.4 <0.4	<0.4 <0.4	<0.4 <0.4	<1.0 <1.0	<1.2 <1.2	2.0 1.3	3.5 1.11

(d) *Subconjunctival Injection*.—Suspensions of 100 mg. of the micronized base were both poorly tolerated and unproductive of any adequate intraocular levels. Most of the terramycin remained at the site of injection as an irritating mass that could be removed four days later.

These results suggest that with clinical doses administered systemically little penetration into the eye is to be expected, and the subconjunctival injection does not overcome this difficulty.

Clinical Studies

These were confined to the use of terramycin ointment (crystalline terramycin hydrochloride 0.5%) at two-hourly intervals. There was no result in five cases of dendritic ulcer nor in three cases of disciform keratitis. The results in five cases of epidemic keratoconjunctivitis were of the same order as those obtained with chloramphenicol.

Summary

Aureomycin, chloramphenicol, and terramycin administered systemically do not penetrate readily into the eye, so that adequate intraocular therapeutic levels are not obtained by such administration.

The poor solubility of these agents limits their use as subconjunctival injections. Even in the micronized form, both aureomycin and terramycin cannot be given in suspension, for any substantial concentration produces marked irritative reactions. Chloramphenicol, however, can be fairly readily administered as a 15% suspension; it is well tolerated, and gives adequate intraocular levels; these levels can be both increased and maintained for a longer time if the suspension contains 0.1% of adrenaline.

In the absence of suitable techniques for the experimental study of virus infection of the eye, clinical assessments were made of the value of these agents in several ocular infections assumed to be due to viruses.

(a) Aureomycin in the form of ointment 1% or subconjunctival injection of 10 mg. did not improve dendritic ulcer, disciform keratitis, herpes ophthalmicus with corneal involvement, and in a nondescript group of corneal lesions with superficial punctate staining. In five cases of epidemic keratoconjunctivitis there was symptomatic relief to ointment, but no effect on the superficial corneal staining.

(b) Terramycin ointment 0.5% did not improve dendritic ulcer and disciform keratitis. There was a gratifying response in five cases of epidemic keratoconjunctivitis, the condition clearing up within two to seven days.

(c) Chloramphenicol, in the form of 1% ointment or drops 0.5%, or subconjunctival injection of 0.5 ml. of 15% solution, did not improve dendritic ulcer and disciform keratitis. There was also no improvement with any of these methods, or with oral administration, in four cases of herpes ophthalmicus and in one case of sympathetic ophthalmia. The results were likewise negative in neuroparalytic keratitis, "chronic follicular conjunctivitis," and "superficial punctate keratitis." Gratifying results were obtained in 26 cases of epidemic keratoconjunctivitis treated either by 1% ointment or by drops of 0.5%. A good result was also obtained by repeated subconjunctival injection of the 15% suspension in a case of post-operative infection of the eye caused by a pneumococcus insensitive to penicillin and the sulphonamides.

It may be concluded that, of the newer antibiotics, aureomycin is of little value in ophthalmology; terramycin is useful in ointment form for epidemic keratoconjunctivitis; and chloramphenicol gives results as good as or better than terramycin in epidemic keratoconjunctivitis. Of these three antibiotics, chloramphenicol is the only one which can be given in a relatively high concentration subconjunctivally; it may be of value in the occasional cases of intraocular infection due to organisms sensitive to chloramphenicol but insensitive to the sulphonamides, to penicillin, or to streptomycin.

Apart from the control of epidemic keratoconjunctivitis—a presumed virus infection—by both terramycin and chloramphenicol, the virus diseases of the eye still remain a therapeutic problem.

Our thanks are due to Cyanamid Products, Ltd. (Lederle Laboratories Division), Parke, Davis & Co., Ltd., and Chas. Pfizer & Co., Inc., for generous supplies of aureomycin, chloramphenicol, and terramycin respectively. Aureomycin was also obtained from the Medical Research Council. Dr. Joan Farrar and Mr. I. W. Payne helped with the clinical assessments on cases referred to us by the staff of the Royal Eye Hospital. Dr. P. Muggleton and Mr. B. I. Helliwell, of Glaxo Laboratories, assisted in the experimental work. We are also indebted to Sister Thorogood and Sister Altenberger for their loyal co-operation in the care of patients admitted to the eye unit at Lambeth Hospital.

BREAST-FEEDING IN THE OXFORD CHILD HEALTH SURVEY

PART II—COMPARISON OF BOTTLE- AND BREAST-FED BABIES

BY

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AND

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In a recent paper some of the social and biological factors which influenced the breast-feeding habits of mothers in the Oxford Child Health Survey were discussed (Westropp, 1953). It remains to discover what special advantages, if any, were enjoyed by the breast-fed babies.

In the following account the change-over from breast-feeding to artificial feeding is referred to as the weaning period. In a few cases complete breast-feeding was never established, but for most of the babies three distinct modes of feeding were represented in the first year: (1) Complete breast-feeding or pre-weaning period: during this phase the only additions to a diet of breast milk were vitamin concentrates. (2) Mixed feeding or weaning period: during this phase the babies were receiving breast milk and other liquid or solid foods. (3) "Other" feeding or post-weaning period: this phase began when the baby ceased to have any breast milk.

Growth and Development

For 142 of the 580 babies who remained in the Survey for a year, weaning began during the first month (group 1), and for 235 it was postponed for at least five months (group 4). In addition, there were 84 babies who began to be weaned in the second or third month (group 2) and 119 in the fourth or fifth month (group 3). The composition of these four feeding groups in respect of sex, parity, birth-weight, and parents' weights is shown in Table I. These

TABLE I.—*Sex, Parity, Birth Weight, and Parental Weights of Four Groups of Babies Defined by Duration of Complete Breast-feeding*

Feeding Group	Age in Months at Onset of Weaning Period	No. of Babies	% Boys	% First-born	Average Birth Weight (lb.)	Average Weight (lb.) of	
						Fathers*	Mothers†
1	0–	142	53.5	41.2	7.53	158.8	131.8
2	1–	84	50.0	51.0	7.33	161.0	132.9
3	3–	119	57.1	55.5	7.66	161.5	131.8
4	5+	235	47.8	41.6	7.54	156.3	132.1
Total		580	51.2	46.0	7.52	158.6	132.1

* Based on 456 records.
† Based on 530 records.

characteristics have been displayed because they are known to have influenced weight gain during the first year (Parfit, 1951; Hewitt and Stewart, 1952).

Body Weight.—According to Table I there was so little difference between the four feeding groups for the factors mentioned that, had the rate of growth been the same for both breast- and bottle-fed babies, each should have gained approximately the same amount of weight. It is therefore significant that by the end of six months there was a definite weight gradient (see Table II); at this age the babies who had been bottle-fed longest were, on average, 12½ oz. (355 g.) heavier than the babies who were breast-fed longest. By the end of the year the average weights of the three groups

TABLE II.—*Increase in Body Weight from 0 to 6 Months and from 6 to 12 Months. Comparison of Four Feeding Groups*

Feeding Group	Average Increment (in lb.)		Average Weight (in lb.) at 1 Year
	0–6 Months	6–12 Months	
1	9.77	5.12	22.42
2	9.47	5.61	22.41
3	9.25	5.25	22.16
4	8.99	4.92	21.45
Total	9.29	5.14	21.95

weaned before the age of 5 months were roughly the same, but these babies were still appreciably heavier than the babies who continued to receive nothing but breast milk for longer periods.

Development of Bones and Teeth.—In Table III the bones and teeth of the babies in the four feeding groups are compared. The comparison, which was made at the age of 12 months, is in terms of the number of carpal and epiphyseal bone centres visible in radiographs of the left wrist, the patency of the fontanelle, and the number of erupted teeth. It will be seen that the division of the babies by duration of complete breast-feeding cuts unevenly across

TABLE III.—*Development of Bones and Teeth. Comparison of Four Feeding Groups in respect of Skeletal Maturity, Patency of Fontanelle, and Number of Teeth at 12 Months*

Feeding Group	No. of Babies	Radiological Data			Fontanelle Closed	No. of Teeth per Child
		Distal Radial Epiphysis	No. of Carpal Bone Centres per Radiograph	No. of Babies Not Examined		
1	142	65.4%	2.24	6	30.3%	6.82
2	84	54.9%	2.34	2	41.7%	6.62
3	119	60.7%	2.18	2	31.1%	6.24
4	235	61.8%	2.24	7	26.0%	6.04
Total	580	61.4%	2.25	17	30.3%	6.35

the dates at which the fontanelle closed and the distal radial epiphysis appeared, and leaves the average number of bone centres in the carpus roughly the same for each group. There is, however, nothing to indicate a systematic difference between the breast- and bottle-fed babies in respect of these three characteristics. On the other hand, the analysis of teeth shows a slight but distinct feeding gradient, with the highest average number among the babies who were weaned earliest.

Other Milestones.—Table IV summarizes the available data for the crawling and walking habits of the babies. In both respects the four feeding groups were very much alike, but the babies who dispensed with the crawling stage tended to be concentrated among those who were weaned earliest, and at 14 months the babies who were breast-fed longest were very slightly "less mobile" than the others.

To sum up, by the criteria chosen to demonstrate growth and development there were more resemblances than differences between the breast- and bottle-fed babies. Such differences as have appeared suggest that bottle-feeding, as practised by the mothers of healthy babies in the Oxford Child Health Survey, tended, very slightly, to accelerate growth.

TABLE IV.—*Other Milestones. Comparison of the Number of Babies (Expressed as a Percentage) who were Crawling at 10 Months and Walking at 14 Months in the Four Feeding Groups*

Feeding Group	Crawling		Walking at 14 Months
	At 10 Months	Never	
1	61.8	13.1	67.7
2	69.6	6.0	71.3
3	71.7	5.0	66.7
4	60.2	6.5	63.9
Total	64.4	8.4	66.5

To discover whether this "acceleration" was attended by any increased risk of ill-health, the sickness dossiers of the babies were examined.

Infections

Very few of the babies were under 2 months old when first seen, and the enrolment procedure effectively excluded babies who were seriously ill at or before this age (Thwaites, 1950; Stewart and Russell, 1952). For this reason all incidence rates in the following account will be for the period two to twelve months and not for the whole of the first year. In the case of head colds it was often impossible to identify the precise mode of feeding at the time of the illness, but the more serious infections have been studied in relation to the diet at the time of falling ill, to the total period of complete breast-feeding, and to one another.

To obtain a fair distribution of the illnesses in relation to the pre-weaning, weaning, and post-weaning periods the survey aggregates for three modes of feeding were calculated for each successive month of life (see Table V). This revealed that for 2,094 months, or 30% of the

TABLE V.—Aggregate Months of Exposure to Three Modes of Feeding During the First Year of Life

Age in Months	Mode of Feeding: Exposure Time in Months			
	Breast	Mixed	Other	Total
0-1	509	24	47	580
1-2	414	48	118	580
2-3	372	50	158	580
3-4	332	51	197	580
4-5	272	70	238	580
5-6	151	156	273	580
6-7	37	237	306	580
7-8	5	227	348	580
8-9	2	175	403	580
9-10	0	99	481	580
10-11	0	39	541	580
11-12	0	21	559	580
Total	2,094	1,197	3,669	6,960
% of consolidated first year	30.09	17.20	52.71	100

consolidated first year, the babies were exposed to breast milk only; for 3,669 months, or just over half the year, they had no breast milk, and for 1,197 months (17% of the period) they were exposed to mixed feeding.

In Table VI the first two months of life have been excluded and the exposure periods for the rest of the year calculated for nine groups of babies defined by the duration of the pre-weaning period. Thus the 142 babies who were weaned in the first month were exposed to mixed feeding for 88½ months and to "other" feeding for 1,331½

TABLE VI.—Aggregate Months of Exposure to Three Modes of Feeding Between the Ages of 2 Months and 1 Year for Nine Groups of Babies Defined by the Duration of Complete Breast-feeding

Period of Complete Breast Feeding	Mode of Feeding: Exposure Time in Months from 2nd to 12th Month of Life			
	Breast	Mixed	Other	Total
0-1	0	88½	1,331½	1,420
1-2	0	49½	420½	470
2-3	18½	37	314½	370
3-4	63	63	294	420
4-5	192½	190½	387	770
5-6	581	520½	558½	1,660
6-7	270	155	175	600
7-8	33	14	13	60
8-9	19½	3	7½	30
Total	1,177½	1,121	3,501½	5,800
% of consolidated age period 2-12 months	20.30	19.33	60.37	100

months; while the 166 babies who were weaned in the sixth month were exposed to mixed feeding for 520½ months, to "other" feeding for 558½ months, and to breast milk only for 581 months. These overall "months of exposure" have been used to calculate the attack rates for the three groups of illness shown in Table VII.

Gastro-Enteritis, Bronchitis, and Otitis Media

Between the ages of 2 months and 1 year 118 babies suffered from gastro-enteritis, 108 from bronchitis or bronchopneumonia, and 39 from otitis media or tonsillitis. One of the babies with gastro-enteritis had two distinct recurrences during this period and 20 others had one recurrence. Two babies had separate attacks of bronchitis and bronchopneumonia, and three, after recovery from tonsillitis, subsequently developed otitis media. In Table VII the age and sex incidence of the three disease groups are displayed, together with the attack rates for three categories of "current diet" and five periods of complete breast-feeding. The recurrences are not included in this table, but according to a separate analysis (based on the assumption that a first attack of a specific illness neither protects nor predisposes a baby to a second attack) the recurrence rate for gastro-enteritis doubled expectation while that for bronchitis and bronchopneumonia fell short of expectation. The analysis did not, of course, indicate whether these alterations of risk were determined by biological or social factors.

In Table VII one baby is represented in all three diagnostic groups, 26 in the first two (gastro-enteritis and bronchitis), 8 in the first and the last (gastro-enteritis and otitis

TABLE VII.—Gastro-enteritis, Bronchitis and Bronchopneumonia, and Otitis Media and Tonsillitis. Age and Sex Incidence. Also Attack Rates by Duration of Complete Breast-feeding and Feeding at Time of Onset

Disease Group	Aggregate Months of Exposure	Sex		Age in Months					Duration of Complete Breast-Feeding (in Months)					Mode of Feeding at Onset of Illness			Total
		M	F	2-	4-	6-	8-	10-	0-	1-	4-	5-	6-	Breast	Mixed	Other	
Gastro-enteritis	No. of attacks	61	57	15	32	20	24	27	30	11	14	48	15	11	31	76	118
	Attack rate per 1,000 months	20.5	20.2	12.9	27.6	17.2	20.7	23.3	21.1	8.7	18.1	28.9	21.7	9.3	27.7	21.7	20.3
	Departure from even incidence	P > 0.90		0.20 > P > 0.10					P < 0.01					P < 0.01			
Bronchitis and bronchopneumonia	No. of attacks	62	46	29	26	19	16	18	29	33	15	23	8	16	18	74	108
	Attack rate per 1,000 months	20.8	16.3	25.0	22.4	16.3	13.8	15.5	20.4	26.2	19.4	13.9	11.6	13.6	16.1	21.1	18.6
	Departure from even incidence	0.30 > P > 0.20		0.30 > P > 0.20					0.10 > P > 0.05					0.30 > P > 0.20			
Otitis media and tonsillitis	No. of attacks	19	20	6	8	4	7	14	10	7	4	14	4	5	4	30	39
	Attack rate per 1,000 months	6.4	7.1	5.2	6.9	3.5	6.0	12.1	7.0	5.6	5.2	8.4	5.8	4.2	3.6	8.6	6.7
	Departure from even incidence	0.80 > P > 0.70		0.20 > P > 0.10					0.90 > P > 0.80					0.20 > P > 0.10			
Total	Attack rate per 1,000 months	47.7	43.6	43.1	56.9	37.0	40.5	50.9	48.5	40.5	42.7	51.2	39.1	27.1	47.4	51.4	45.6

TABLE VIII.—Prevalence of Head Cold in Four Feeding Groups and Seven Groups Defined by Size and Composition of Household

Feeding group		No. of Attacks per Child	
		1	2
Feeding group	1	1.69	1.96
	2	1.43	1.45
	3	1.45	1.58
	4	1.32	1.56
Household size	2-3	1.61	1.76
	4	1.25	1.92
	5-6	1.92	2.0
	7+	2.0	
Household: No. of schoolchildren	0	1.25	1.92
	1-2	1.92	2.0
	3+	2.0	

media), and 21 in the second and third (bronchitis and otitis media). The combinations for gastro-enteritis and bronchitis, and for gastro-enteritis and otitis media, are approximately what would be expected for chance associations, but those for bronchitis and otitis media are excessive and accord with the well-known tendency for these two conditions to be associated.

According to Table VII the most conspicuous findings for gastro-enteritis are: (1) that the pre-weaning and weaning attack rates were significantly lower and higher than average; and (2) that the highest recorded rate was for babies weaned in the sixth month and the lowest rate for babies weaned in the second, third, and fourth months. For bronchitis and bronchopneumonia the two lowest rates were for the pre-weaning period and for babies who were completely breast-fed for at least six months, but the differences between these and the rates for other groups are of doubtful significance. There was a slight tendency for the lung infections to affect boys more than girls, babies under 6 months more than those over 6 months, and babies who were breast-fed for less than four months more than those who were weaned later. Otitis media and tonsillitis occurred relatively often in the post-weaning period and after the age of 10 months. The attack rates for different periods of complete breast-feeding showed no signs of being influenced by duration of complete breast-feeding, but during the weaning and pre-weaning periods the incidence was below average.

In general, it is safe to conclude that while the Survey babies were taking nothing but breast milk the risk of intestinal infection was reduced. When finally removed from the breast, however, there was nothing to choose between the sickness experience of the early and late weaners.

Head Colds

During the age period 2 to 12 months only 134 babies remained free from head colds. The remainder shared 916 incidents variously described as a cold, nasal catarrh, sniffles, or influenza. Though there was little or no difference in the cold attack rates for the four feeding groups, when the babies were arranged according to the size of the household to which they belonged, and then according to the number of schoolchildren in the house, a new gradient appeared which indicated a relatively low risk for babies in small households with no schoolchildren (see Table VIII). This finding confirms a suggestion put forward in an earlier paper—namely, that the relationship between "household amenities" and risk of illness in infancy is partly due to the more frequent introduction of infection into the homes with older children (Stewart and Russell, 1952).

Discussion

The unique value of breast milk for small infants with a tenuous hold on life is so well established that failure to find any signs of the breast-fed babies having benefited more than bottle-fed babies may cause some surprise. The findings have, of course, been influenced by the absence of weakly infants in the present group and by the fact that all the babies were under continuous medical supervision. For the former must have reduced feeding problems to a minimum and the latter ensured that, whatever mode of

feeding was adopted, there was every chance of it being carried out efficiently. Nevertheless this is not the only recent survey to suggest that under conditions which prevail to-day the dangers of bottle-feeding are more potential than real.

After analysing the first-year sickness records of 263 babies attending the Harvard Child Health Survey, Stevenson (1947) came to the conclusion that "artificially fed infants do not suffer more from diarrhoea than do nurslings when the feeding is carried out with proper techniques." He did in fact find that in the age group 6-12 months respiratory infections were less common among the babies who had been breast-fed, but the difference was slight, and for all other illness, including gastro-enteritis, the artificially fed babies compared favourably with the breast-fed babies. Norval and Kennedy (1949) also found that "the duration of breast-feeding did not influence the rate of illness." Their work was based on the records of 417 infants who regularly attended welfare clinics in Minnesota, and in this group the incidence of respiratory infections in the second half of the first year was actually higher among the breast-fed than the bottle-fed babies.

Even more convincing than these surveys, which like the present investigation are biased in favour of healthy babies, are the findings of Douglas (1950). He followed up a random sample of the babies born in Great Britain between March 3 and 9, 1946, and discovered that during the first two years of life the incidence was the same in four groups of babies defined by duration of breast-feeding. The only significant difference between the breast- and bottle-fed babies was that the former tended to have their first attack at a later age.

In the light of these earlier findings it should be considered whether the relatively high attack rates for gastro-enteritis among the Oxford babies who were completely breast-fed for five months is evidence of a "nursling risk" which has hitherto escaped attention. It is just possible that these babies had an exceptionally low immunity to infection or that they were more easily upset by the addition of solids to the diet (which frequently coincided with weaning) than the babies who had been bottle-fed. In view, however, of the relatively high prevalence of diarrhoea among all babies during the weaning period, the possibility that the mothers who had never had to prepare a bottle-fed were less skilful in producing "clean meals for spoon feeders" than the other mothers should not be overlooked.

The weight differences revealed in the present investigation also merit close attention. Once again the discovery that bottle-fed babies gain weight more rapidly than breast-fed babies is not unique. Over 20 years ago Glazier (1930) made a similar observation in Boston, Massachusetts, and on the basis of the national survey in this country Douglas (1950) calculated that a baby who is breast-fed to the tenth month may expect to be, at the age of 2 years, 11 oz. (312 g.) lighter than one who has not been breast-fed at all. Hitherto it has not been suggested that these findings amount to evidence of undernourishment among breast-fed babies, but, in view of Vining's (1952) opinion that underfeeding at the breast is "only too common," this possibility can no longer be ignored. Douglas himself suggested that the breast-fed babies may have weighed less because they were unusually vigorous. In support of this view, he estimated that the babies who were breast-fed for ten months walked on average ten days earlier than the babies who were bottle-fed. If, however, the age of walking is an indication of vigour then the breast-fed babies in the present investigation were no more vigorous than the bottle-fed babies.

Forty years ago, when it was fashionable to ascribe all manner of complaints to overfeeding, it might have been suggested that the greater weight of the bottle-fed babies was detrimental to their health. But it is now held that overfeeding in infancy is "a matter of opinion rather than a real disorder" and that it rarely, if ever, causes harm

(Wickes, 1952; Vining, 1952). In any case there was no more illness among the bottle-fed than among the breast-fed babies. We are therefore driven to the conclusion that, in spite of continuous medical supervision, minor degrees of underfeeding among the breast-fed babies had occurred and had been overlooked.

If there is any truth in the opinion that the high prevalence of diarrhoea among babies who were nursed until they were old enough to be spoon-fed is due to faulty technique, and if the weight records constitute evidence of "latent" underfeeding among the breast-fed babies, then the survey findings present a new challenge to the advocates of natural feeding. That breast-feeding has advantages to both mother and child which will never show on a weight chart no paediatrician will seriously deny, but artificial feeding is now so safe and easy that the slightest neglect of the special problems of nurslings could produce a sharp popular reaction against breast-feeding.

Summary

The early progress of 580 babies in the Oxford Child Health Survey has been studied in relation to feeding habits.

At the age of 1 year the babies who were bottle-fed from the beginning were appreciably heavier than the babies who were completely breast-fed for five months or longer. They also showed signs of being slightly more mature. It is suggested that these differences are due to minor degrees of under-feeding among the breast-fed babies.

For three disease groups—gastro-enteritis, bronchitis and bronchopneumonia, and otitis media and tonsillitis—there was no evidence that the duration of complete breast-feeding influenced the overall infection rates. Gastro-enteritis was comparatively rare so long as the babies were receiving nothing but breast milk, but it reached its maximum incidence in the weaning period and was especially common among babies who began to be weaned in the sixth month.

Colds, which were most frequent in large households and households with several children of school age, were almost equally common among breast- and bottle-fed babies.

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The British Legion Village at Preston Hall, near Maidstone, for tuberculous ex-Service men and women has now been in existence for 28 years, and the record of its accomplishments during that period has recently been published in the form of a souvenir brochure. Its 50 beds in 1925 had grown to 926 by 1948, when they came under the authority of the regional hospital board. The village settlement and industrial training centre includes all the amenities necessary for a self-contained community. Over 11,000 men and women have taken advantage of the services offered. The brochure is a useful guide to the facilities available at Preston Hall for the rehabilitation of tuberculous ex-Service men and women, who during their stay are enabled to live normal family lives.

FUTURE OF SURGERY IN SENILE OBLITERATIVE ARTERIAL DISEASE*

BY

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Senile obliterative arterial disease, often called arteriosclerosis, is one of the most important problems which the medical profession has to face, and as our population ages this problem is likely to increase in magnitude. All authorities agree that it is a very common disease, that it is much more frequently seen in middle and late life than in the young, that it often exists in a subclinical state before symptoms occur, and that the first clinical effect may be the patient's death from coronary or cerebral vascular occlusion.

When one thinks about the surgical treatment of senile obliterative arterial disease one fact must never be forgotten—that it is a general disease affecting the arteries of the whole body. In some patients the most abnormal vessels are in the lower limbs; they suffer from intermittent claudication or gangrene of the toes. In others the coronary arteries are affected and the patients develop either angina pectoris or coronary occlusion, while some suffer from the well-known symptoms of cerebrovascular disease or an aneurysm of the aorta. In all these patients the whole arterial system is abnormal, but one region is affected more than others, and it is against these local manifestations of a general disease that a surgeon's efforts can be directed.

An anatomical study of the changes in the arteries of these patients shows that the local manifestations are produced in a high proportion of patients by a relatively short thrombosis in a main vessel. Thus a patient with intermittent claudication usually has a thrombosis of a segment of his superficial femoral or popliteal arteries. Fig. 1 is an arteriogram from such a patient; this shows the local thrombosis and the general disease above and below the block, where plaques of atheroma can be seen in the vessel wall. Realization of this fact is changing the whole approach of surgeons to this disease, not only in the case of the superficial femoral and popliteal arteries, but also when the thrombosis is in the abdominal aorta, common or external iliac arteries, the carotid arteries, and even perhaps in the future in the coronary or cerebral vessels.

In the past, surgeons have used an indirect approach when treating the symptoms of senile obliterative arterial disease. They have employed methods designed to increase the collateral circulation such as sympathectomy (Ross, 1935), they have tried to increase the blood flow to the part by creating an arteriovenous fistula (San Martín, 1902), they have ligated the main vein in an attempt to increase the oxygen supply to the tissues by producing venous congestion (Makins, 1919), they have attempted to relieve pain due to ischaemia by interrupting the afferent nerve pathways (Jonnesco, 1920), and they have put the ischaemic muscle at rest by interrupting its motor nerve supply (Learmonth and Slessor, 1952) or by dividing its tendon (Boyd, 1950). In the case of coronary artery disease attempts have been made to increase the blood flow to

*Part of a postgraduate lecture given in New Zealand in September, 1952.

the myocardium by producing adhesions between the heart and the pectoralis major muscle (Beck, 1935), the heart and the great omentum (O'Shaughnessy, 1936), and the heart and the pericardium (Heinbecker and Barton, 1940). Other methods include ligation of the great cardiac vein (Fauteux and Palmer, 1941), the formation of an arteriovenous anastomosis between the coronary sinus and an artery (Beck *et al.*, 1948), implantations of the internal mammary artery into the myocardium (Vineberg, 1952), and various procedures designed either to decrease the activity of the heart such as thyroidectomy (Blumgart *et al.*, 1933) or to relieve cardiac pain (Swetlow, 1926). All these operations, whether on the limbs or on the heart, suffer from one great and obvious defect—the approach is indirect.

The Direct Approach

Probably the first surgeon to realize the importance of a direct attack upon the occluded segment of artery was Leriche; he performed the operation of arteriectomy in which the thrombosed portion was excised (Leriche *et al.*, 1937). Dos Santos (1947) took this step further with his operation of disobliterative endarteriectomy, the first procedure designed to restore the blood flow through the blocked artery. In this operation the vessel is opened, the thrombus removed, and the vessel repaired again. The results if successful are better than with most of the indirect procedures, but the success rate is not very high; Reboul and Laubry (1950) report that of 93 disobliterations 44 (47%) remained patent, 38 clotted again, and 11 patients died. A better method is to replace the thrombosed segment of artery by an autologous vein graft or a homologous artery graft. In our experience between 50 and 60% of all patients with intermittent claudication or gangrene of the toes have a lesion in their arteries which is anatomically suitable for an artery or vein graft. In actual practice only 20% or less of these patients are suitable, the others being rendered unsuitable by such factors as age and the presence of cerebrovascular or coronary artery disease. It is obviously a waste of time to graft a patient who suffers from intermittent claudication at 100 yards for him to be stopped after a successful operation by the worse pain of angina pectoris at 150 yards. In the case of gangrene of the toes the indications for grafting are great; here, particularly if the alternative is a major amputation, a graft is justified whenever it is a practical possibility.

Vein Grafts.—The first successful vein-to-artery autograft in man was performed by Lexer in 1912. He excised a popliteal aneurysm and replaced it by a vein graft. The development of this method of replacing the thrombosed artery in senile obliterative arterial disease has been carried out almost entirely on the continent of Europe. Fontaine and Hubinont (1950) have had considerable experience of this operation, and of their first 18 grafts 8 (44%) were successful and remained patent. The advantages of vein grafts are that they are autologous; this means that they may live and an artery bank is not necessary. If the saphenous or external jugular veins are used no ill effects arise from the sacrifice of these veins. Their disadvantage is that if the host vessel is arteriosclerotic they are technically more difficult to insert than artery grafts. We therefore use vein grafts when the host's vessels are normal or nearly so; as our technique improves we hope to use them more frequently in the treatment of senile obliterative arterial disease, but to date the success rate in these patients has not been as high as with artery grafts.

Artery Grafts.—These are of necessity homologous and do not survive in the host; his tissues gradually grow in and replace the graft by a process of creeping substitution: the media and adventitia by fibrous tissue, the intima to a small extent by growth from the ends of the host vessel but mostly as cells deposited on to the surface of the graft from the blood stream; the elastic lamina, which is an extracellular structure, appears to survive. An artery

homograft therefore acts as a scaffold which maintains the blood flow whilst the tissues of the host are growing in to form a new channel. An essential requirement for efficient artery grafting is an artery bank. The first human artery bank was developed by Gross and his colleagues (1949); they preserved their vessels in nutrient saline, and the results have been excellent. An alternative method which we use is that of Eastcott and Hufnagel (1950): the grafts are frozen and stored at a temperature of -70°C . or less; these grafts are equally satisfactory, and the bank is easier to manage because the grafts can be stored for long periods and perhaps indefinitely. Artery grafts have been used to replace the thrombosed segment of artery in a number of sufferers from senile obliterative arterial disease (Rob, 1953). To date this direct attack upon the thrombosed segment of artery has been confined to the aorta, its main branches, and the major vessels of the neck and limbs. The results have been satisfactory, and Figs. 1 and 2 illustrate a typical femoral arteriogram before and after an artery graft.



FIG. 1

FIG. 2

FIG. 1.—Femoral arteriogram showing a thrombosed segment of superficial femoral artery. This patient suffered from severe intermittent claudication. FIG. 2.—Arteriogram from the patient shown in Fig. 1 after an artery graft. He can now walk for miles without pain.

The direct approach has reached a stage at which it is a practical everyday possibility to replace an occluded segment of a large or medium-sized artery by an autologous vein graft or a homologous artery graft, and operations of this type have been performed in many hospitals all over the world. But what of the future and, in particular, what are the possibilities of grafting such arteries as the coronaries?

Grafting the Coronary Arteries

Murray (1950) has resected a portion of a dog's coronary artery and restored continuity by using a vein graft to bridge the defect. This is a very difficult operation in the dog, but it should be easier in man, in whom the main coronary arteries are about 3 mm. in diameter. The human coronary artery is about the same size as the dog's common carotid, in which a graft succeeds in over 50% of cases (Eastcott and Hufnagel, 1950).

Senile obliterative arterial disease of the coronary arteries is often a diffuse process involving both coronary arteries, but in a minority of patients the disease is relatively localized and suitable, at least anatomically, for replacement by a vein or artery graft. Harrison and Wood (1949) found that of 15 patients who died of ischaemic heart disease eight had diffuse disease with all the major coronary arteries narrowed and irregular, but in seven the disease was limited to one artery, usually the left, or to part of an artery, the remainder of the coronary tree being relatively normal. From a study of the material presented in their paper it appears that two patients (13%) had a lesion in their coronary arteries which was anatomically suitable for a graft.

A personal study of this problem has led me to believe that this figure of about 10% is a fair picture of the proportion of sufferers from angina pectoris or perhaps early coronary occlusion who might receive benefit from such an operation. The difficulty is to select these patients. In this connexion a paper by Blumgart *et al.* (1940) is of interest. They found that the coronary arteries of 12 patients with angina pectoris were diffusely arteriosclerotic, with multiple occlusions in 10 cases, and that the two patients in whom the occlusions were limited to one artery showed diffuse and widespread disease of this vessel. On the other hand, the hearts of 12 patients who died from coronary occlusion without previous angina pectoris showed that in 10 the disease was confined to one artery only. A study of the diagrams in their article leads me to believe that three of this latter group could have been treated with an artery graft.

It is possible that clinical features such as the distribution of the pain or the findings on electrocardiography may give valuable information on this problem. The location of the infarct can be determined by these means, but to date no effort has been made to correlate these features with the suitability of coronary artery disease for an artery graft. Such a study is being carried out, but it will be several years before any worth-while conclusions can be published. An alternative and more direct approach is arteriography of the coronary tree. Radner (1945) carried out coronary arteriography by direct puncture of the ascending aorta in both man and dogs; he obtained a faint outline of the coronary arteries, but the complications were too frequent and the method had to be abandoned. Jonsson (1948) visualized the coronary arteries during catheterization and angiocardiology. The catheter was passed up the brachial artery to the aortic valve, when the contrast medium was injected. No ill effects were noted. On the other hand, Helmsworth *et al.* (1951) catheterized the left carotid artery in 10 human patients; in 5 they obtained a satisfactory coronary arteriogram, but one died—a woman of 88—after her sixth injection of 10 ml. of 70% "diodrast."

Both main trunks of the human coronary arteries are reasonably accessible to the surgeon and both move very little with the heart beat. This latter fact is important, because it is possible in animals, and should be possible in man, to graft the coronary arteries whilst the heart is beating, an extracorporeal circulation being unnecessary. It is probable that patients with complete occlusion of a main coronary artery would be made no worse by temporary interruption of the artery during the operation of grafting. In patients with only partial occlusion ventricular fibrillation might follow interruption of the blood flow; in these it would be necessary to put in the graft over a fine polythene tube and then remove the tube just before the second anastomosis had been completed; by this means the blood flow to the myocardium could be maintained during the greater part of the operation. Murray (1947) has excised the area of infarction from a dog's heart after occlusion of a main coronary artery; the results were good. It may well be that, in man, the treatment of acute occlusion of the main stem of one coronary artery when the other is normal will be an emergency operation to replace the occluded segment of coronary artery by a graft followed by excision of the myocardial infarct with repair of the cardiac defect, while patients with severe angina pectoris will be treated by a graft if the disease is confined to the main stem of one of the coronary arteries; but it is likely that suitable patients for these operations will be rarities.

Other Sites

It can be stated that in selected patients the direct treatment of senile obliterative arterial disease is now an established procedure and that this type of operation may be extended to include some sufferers from coronary occlusion, but what of the other important sites of senile arterial disease?

Intracranial Arteries.—The carotid arteries outside the skull can be replaced by a vein or artery graft, but any direct approach to intracranial obliterative arterial disease has yet to be attempted. An exception to this is provided by the surgical control of bleeding intracranial aneurysms, a proportion of which are due to senile obliterative arterial disease (Falconer, 1952). The replacement of segments of those arteries by grafts has not yet been attempted but should be possible, although the thin nature of their walls will make the operation more difficult than in other situations. The selection of patients should be relatively simple because of the highly developed state of cerebral arteriography.

Aorta.—This vessel between the left subclavian artery and the diaphragm and below the renal arteries has been replaced by a graft on many occasions (Brock, 1953). Progress will be by the extension of such an operation to include either the arch of the aorta or the upper abdominal aorta. In both these situations there are many important branches, and added to the technical difficulty of having to perform several anastomoses would be the necessity of maintaining during the operation an adequate blood flow to such essential structures as the brain, spinal cord, and kidneys. In my opinion these difficulties are not insuperable and it should be possible to replace some simple aneurysms and treat some dissecting aneurysms in these regions by a graft of the appropriate segment of aorta with its branches. The blood flow could be maintained by one or more polythene tubes, placed through the clamps but inside the graft, and removed just before the completion of the final anastomosis.

Conclusion

A direct approach to the local manifestations of a general condition—senile obliterative arterial disease—is now a practical possibility. In the future it may be possible to extend the scope for operations of this type. I feel that grafting the coronary arteries will be performed successfully during the next few years; this is not the difficult hurdle. What is much more important is to study this disease so that we can relate symptoms and signs to those features of the disease which will make a graft successful and will prevent unnecessary operations on patients unsuitable for grafting. This will be far more difficult than the technical perfection of an operation. The problem is being studied.

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UNUSUAL SMALL-INTESTINAL CAUSES OF ANAEMIA

BY

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In 1952 the following three cases of rare small-intestinal lesions producing anaemia were seen on the surgical unit at the London Hospital.

Case 1. Carcinoma of Jejunum

A spinster (record No. 28809/52) was admitted on August 17, 1952, under Mr. Alan Brews with a provisional diagnosis of "malignant ovarian tumours with subacute intestinal obstruction."

Background.—She was born in 1903 and came fourth in a family of seven. Three brothers and two sisters were still living. Apart from her father, who had a haematemesis in 1952 at the age of 81, there was no history of gastrointestinal disease. She was an intelligent woman and had made a career for herself. After her mother's death she looked after her father. She was a life-long non-smoker and did not take alcohol. She took cascara two or three times a week, and remembered being told by her mother that as a child her bowels were stubborn.

Course of illness.—The onset of symptoms was vague. At some time between February and April, 1950, she went to her doctor because of missed periods and was given some tablets. The periods returned and were regular for six months. She next visited her doctor in April, 1951, because she was sleeping badly and had indigestion and was also tired and depressed. In September the war damage to her home was at last repaired. The upset caused by builders in the house "just about finished her off." Possibly she felt too tired to go to her own doctor, and whatever the reason for delay her next visit to him was in April, 1952, when her complaints were more definite. She was passing more wind than usual per rectum, was a little short of breath on going upstairs, and had some diffuse discomfort, which felt like wind. This discomfort got worse and became painful when she was hungry. As soon as she started to eat her appetite went and she felt sick. It is interesting to note that she denied any loss of weight. In fact she complained that she had to buy new clothes because she was developing middle-age spread. While on holiday from June 14 to 19 she began to vomit up "fluid like dirty water." In July she had severe lower abdominal pain for the first time, and this was associated with vomiting up "cascades of dirty water."

In view of the urgent nature of the obstruction it was impossible to investigate her fully. Examination showed bilateral pelvic swellings. The haemoglobin on admission was 46%. Two days later a laparotomy was done, and bilateral ovarian cysts were removed. An annular constricting tumour was found in the jejunum about 9 in. (22.5 cm.) below the duodeno-jejunal flexure. This was removed and an end-to-end anastomosis made.

The patient made a good recovery and left the ward on September 19. Two months later she looked fairly fit. Her bowels were all right for the first time in her life without aperients, but she was getting pain in the back. On examination a hard lump was felt in the right axilla and also in the pouch of Douglas. She died in May, 1953.

Microscopical examination proved the jejunal lesion to be an adenocarcinoma extending into the mesentery. Sections of the ovaries showed bilateral columnar and tubular secondary carcinoma.

TABLE 1.—Carcinoma of Small Intestine (Pylorus to Ileo-caecal Valve). From the London Hospital Records, 1908–52

	Surgical Specimen	Post Mortem	Total
Duodenum	10	28	38
Region of the ampulla of Vater	7	21	
Above the ampulla	2	4	
Below	1	3	
Duodeno-jejunal flexure	3	1	4
Jejunum	6	4*	10
Ileum	15	5	20
Total	34	38	72

* Includes one probable secondary tumour.

Comment.—The habitual use, or rather abuse, of aperients in this case presumably blurred the onset of symptoms due to the stricture. The anaemia was due partly to bleeding and partly to the disturbance of absorption. Carcinoma of the small intestine is rare. From 1908 to 1952 72 cases were seen at the London Hospital (Table 1). If the duodenal cases, which as a class merge into carcinoma of the ampulla of Vater and pancreas, are omitted only 13 cases occurred at or below the duodeno-jejunal flexure.

Eight of the nine jejunal carcinomata were annular constricting growths and one was a polypoid situated 75 cm. beyond the flexure. Fig. 1 emphasizes the interesting point that the site is usually fairly close to the flexure. The 20 ileal carcinomata, on the other hand, tended to occur not far above the ileo-caecal valve.

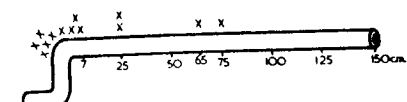


FIG. 1.—Site of jejunal carcinoma in 13 cases—nine at flexure, two "fairly high," one 65 cm. beyond, and one half-way along.

Case 2. Leiomyosarcoma of Duodenum

A married woman (record No. 24329/52) was admitted under Dr. Donald Hunter as an emergency case from the cardiac department on July 10, 1952, with a provisional diagnosis of "anaemia, cirrhosis of liver."

Background.—She was born in 1906. Neither her parents nor her two sisters and brother had had any gastro-intestinal disease. Since her marriage in 1938 she had looked after her only child, born in 1939, and her home. Her husband, a G.P.O. van driver, served in the Army during the war. She was a non-smoker, took alcohol only at parties, and had never needed opening medicine for her bowels until 1950, when she began to take liquid paraffin.

Course of illness.—The onset of symptoms is difficult to determine. During pregnancy she had attacks of palpitation followed by giddiness and fainting. During the war three further attacks occurred and after the war a few minor ones. In 1952 the attacks became more serious and culminated in her collapsing in a swimming-bath. She was then referred to hospital.

Her doctor's story is slightly different. She attended the surgery from time to time with various minor complaints, but there were no symptoms which could be attributed to anaemia until February, 1952, when she fainted. In July she fainted again, and also vomited blood, and so was sent straight away to the London Hospital.

Examination after admission showed a pale woman with a lump in the right loin. No other abnormality was detected on examination. Her haemoglobin was 48% and the liver-function tests were normal. A barium meal on July 21 and a barium enema on August 8 were reported as being "normal." (Re-examination of the films showed an indentation of the stomach and colon by an extraluminal mass corresponding to the tumour found at operation.) At subsequent physical examinations no lump could be felt.

She was going to be sent home, but on August 24 a further severe haemorrhage occurred and she became disorientated. The lump in the loin was again felt. A laparotomy was carried out after transfusion. A semi-cystic tumour was found arising from the posterior wall of the second part of the duodenum and extending in the mesocolon as far as the hepatic flexure. The tumour was removed together with some duodenum. The hole was repaired, but the consequent constriction of the lumen made it necessary to do an emergency gastro-enterostomy four days later. Her recovery was uneventful, and when last seen in June, 1953, there was no digestive discomfort.

Examination of the tumour showed a very vascular leiomyosarcoma surrounding a diverticulum lined with duodenal mucosa. Presumably the tumour originated as an intramural nodule and as it grew out subperitoneally it carried duodenal mucosa with it. Ulceration of the lining of the diverticulum led to haemorrhage which produced a tense mass. Later, as the blood found its way into the lumen of the gut, the mass became soft and impalpable.

Comment.—The hospital records from 1908 to 1952 show five other cases of leiomyosarcoma of the small intestine (Table II). Four had formed diverticula, the contents of

TABLE II.—*Sarcoma of Small Intestine (Pylorus to Ileo-caecal Valve). From the London Hospital Records, 1908-52*

	Surgical Specimen	Post Mortem	Total
Leiomyosarcoma	2	4	6
Duodenum	1	1	2
Jejunum and ileum	1	3	4
Lymphosarcoma	16	22	38
Duodenum	0	3	3
Jejunum and ileum	16	19	35

three being pus and one of blood. One arose from the duodenum. It perforated and the patient died of peritonitis. At necropsy a coincidental cirrhosis of the liver was found. Another of these patients was known to be well three years after resection in 1927, but it has proved impossible to trace her since that time. The fifth tumour, in the lower ileum, was solid and caused an intussusception.

Case 3. Diffuse Angiomatosis of Intestine

A man (record No. 48660/51) was admitted under Dr. Kenneth Perry from the Brentwood District Hospital on December 28, 1951, because of persistent anaemia.

Background.—He was born in 1917. His parents and his brother were healthy. He was a bachelor living with his parents. He had worked as a carpenter for the local council and had served in the Black Watch during the war. He had always been a light smoker and taken little alcohol. His bowels were regular and he almost never took aperients. He admitted to epigastric discomfort occurring about one to one and a half hours after meals, which first came on in 1944 while he was in the Army; further bouts occurred, especially in the winter, but they were slight and he never went to a doctor about them.

Course of illness.—The first symptoms suggesting anaemia occurred in the summer of 1948, when he began to get very tired. He went to his doctor and his haemoglobin was found to be only 33%. During the next months he was given liver and iron and felt himself again. At Christmas, 1950, there was a relapse and this time recovery was less complete. Throughout 1951 symptoms of anaemia persisted. In December, when he was admitted to the Brentwood District Hospital and investigated, his haemoglobin was 35%. As no cause for the anaemia could be found he was transferred to the London Hospital.

Examination showed a well-built muscular man, 5 ft. 11 in. (1.8 m.) tall and weighing 13 st. 4 lb. (84.4 kg.). There were

no spider naevi, but the tip of his spleen was felt on one occasion. The blood picture was that of severe secondary anaemia. Two barium-meal examinations revealed no abnormality. The findings at laparotomy on February 8, 1952, are shown in Fig. 2. The stomach and large gut appeared normal. The whole of the small gut was affected, the feel being similar to that of a distended pulsating varicocele. Even the peripheral arteries were big and were seen

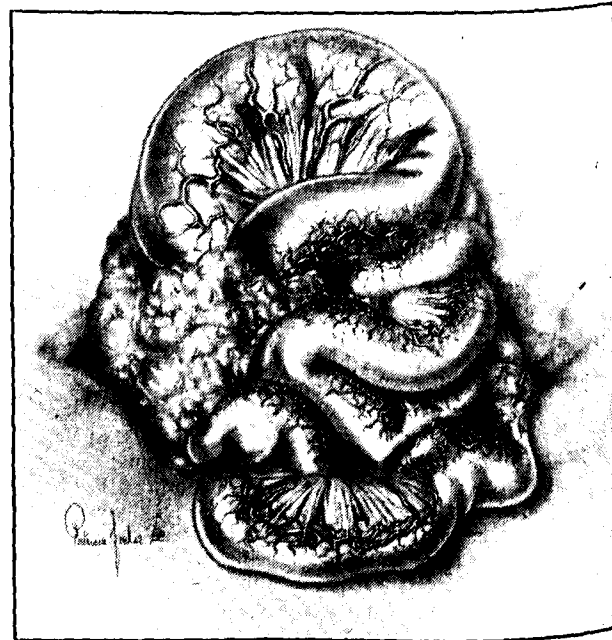


FIG. 2.—Case 3. Drawing to show the diffuse angiomatosis of small intestine.

to be pulsating vigorously. Apart from this the liver and portal vein were normal. The spleen was about normal size, with a splenunculus of a similar size attached to its lower pole.

Since discharge the patient had a further melaena in August, and had to be readmitted to hospital in 1953 for transfusions following a more severe haemorrhage.

Comment.—There is no record of a similar case at this hospital. Fortunately it was possible for Miss P. Archer to make a drawing from her operation sketch. Peyton (1938) described a similar case in a boy aged 15; and Kalliser (1936) reviewed the literature of intestinal angioma up to 1936.

Summary

Three cases of rare lesions of the small intestine are described. The lesions were carcinoma of the jejunum, leiomyosarcoma of the duodenum, and diffuse angiomatosis of the intestine. All three patients presented with anaemia. The early symptoms were vague and the diagnosis was difficult.

Seventy-two cases of carcinoma and 44 cases of sarcoma of the small intestine have been recorded at the London Hospital since 1908. The sites of the tumours are recorded. The similarity in site and pathology of the jejunal tumours is stressed. The tendency for diverticulum formation in the cases with leiomyosarcoma is also recorded.

We wish to thank Mr. Alan Brews for asking us to undertake the gut resection in Case 1; Miss P. Archer for the drawing of Case 3; and Dr. Denys Jennings for his help in preparing this paper.

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THREE CASES OF SMALL-INTESTINAL NEOPLASM WITH UNUSUAL CLINICAL FEATURES

BY

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New growths of the small intestine occur infrequently. Ewing (1940) states that the comparative incidence of malignancy in the large and small intestines is 97.5% and 2.5% respectively. Neoplasms of the small intestine may first produce symptoms because of (a) intestinal obstruction, (b) an associated anaemia (see Cases 1 and 2), or (c) rarely because of malabsorption (see Case 3). In the absence of obstructive symptoms the diagnosis may be most difficult to make.

The first two cases are presented because of the long latent period (17 months and four years respectively) between the recognition of an obscure anaemia and the ultimate discovery of its cause in spite of the most thorough investigations. The third case is described because of its initial clinical manifestations as idiopathic steatorrhea.

Case 1

In January, 1948, a 59-year-old woman began to have symptoms of general loss of strength, diarrhoea, and some colicky abdominal pain. She had lost 21 lb. (9.5 kg.) in weight in the preceding year. She was first seen at the blood clinic in April, 1948, when physical examination was negative, except for slight pallor. The haemoglobin was 66% (14.8 g.=100%), red-cell count 3,800,000, and colour index 0.86. The possibility of an alimentary tumour was considered, but an investigation with barium meal and enema was negative. Ferrous sulphate failed to raise the haemoglobin level, and in September she was admitted to hospital. The haemoglobin was 44%, red-cell count 3,420,000, and colour index 0.65. The blood Wassermann reaction was negative and the E.S.R. was 75 mm. in one hour. The stool benzidine test was carried out on six occasions and was strongly positive on three. Fat-balance studies were negative. Gastric analysis revealed a histamine-fast achlorhydria. Sternal puncture showed a normoblastic reaction. A barium meal and follow-through was negative.

On October 25 the first of two injections (200 mg. and 80 mg. respectively) of intravenous iron was given. These were not continued because of unpleasant side-reactions. At the time of discharge (November 24) the haemoglobin had risen to 64%, and 30 gr. (2 g.) of iron and ammonium citrate was given three times a day. This was followed by a rise in haemoglobin to 90% on January 20, 1949, and iron therapy was discontinued. In April the patient was feeling well, but her haemoglobin had fallen to 64%. Iron was started again, but produced no significant rise in the haemoglobin level. On September 8 she complained of loss of appetite and a dull ache on the left side of the abdomen. There was no history of vomiting or melaena. The haemoglobin had fallen to 56%. Manual examination of the abdomen revealed for the first time the presence of a firm, slightly tender mass in the left hypochondrium. It was not fixed to skin and was about the size of an orange. Sigmoidoscopic examination and barium enema were negative.

In November laparotomy was carried out. In the left hypochondrium a tumour of the jejunum was discovered. It was not obstructing the lumen, but was adherent to the descending colon and had spread to the adjacent mesenteric lymph nodes. Microscopical examination revealed a carcinoid tumour with more cellular irregularity than usual and frequent mitotic figures. The tumour was resected, and the patient made an excellent post-operative recovery. She remained well for eleven months, but in September, 1950, the occurrence of upper abdominal pain and tenderness suggested recurrence of the tumour. Her condition gradually deteriorated and she died in April, 1951. The post-mortem examination showed recurrence of the tumour in lymph nodes adjacent to the anastomosis, with further involvement of the bowel wall and metastases in the lungs.

Case 2

A woman aged 58 reported to the blood clinic in January, 1948. She gave a history of general malaise, dyspnoea, palpitations, and precordial pain on exertion of one year's duration. Her appetite was good and her diet satisfactory. There was no history of dyspepsia, change in bowel habit, or melaena, or previous illness. On physical examination no abnormalities were detected apart from a moderate degree of pallor. The blood count showed: haemoglobin, 34%; red cells, 3,440,000; colour index, 0.5. The cause of the anaemia was not apparent and the possibility of a silent alimentary tumour was considered.

The patient was admitted to hospital for further investigation. The stool benzidine test was repeatedly strongly positive. There was free acid in the gastric juice, the E.S.R. was 25 mm. in one hour, and the blood Wassermann reaction was negative. A barium meal and enema were also negative. A total of 1,525 mg. of iron was given intravenously over a period of seven weeks, and on discharge on March 20 her haemoglobin was 70% and red-cell count 3,700,000. In April her haemoglobin was 68% and red-cell count 4,280,000, and she was given molybdenized ferrous sulphate, with no beneficial effects. During the following month she received 600 mg. of iron intravenously. In May her haemoglobin had risen to 82% and the red-cell count was 4,550,000. In July she complained of a gradual recurrence of malaise, breathlessness, and precordial distress on exertion and her haemoglobin had fallen to 56%. From then until June, 1949, her haemoglobin ranged from 60% to 76% in spite of continuous oral iron therapy.

When next seen in February, 1952, her haemoglobin was 37% and red-cell count 2,900,000. She had palpitations, dyspnoea, and precordial distress on exertion. It was estimated that she had lost about 14 lb. (6.4 kg.) in weight during the preceding six months. Abdominal examination revealed a mass the size of a foetal head to the left of the umbilicus. The tumour was smooth and not fixed to skin. At laparotomy on March 10 a large tumour involving the proximal 2 ft. (60 cm.) of jejunum was found. At one point it had invaded the peritoneum, but there was no gross evidence of metastases. The tumour was resected and an end-to-end anastomosis performed. Microscopically the tumour consisted of clumps of polyhedral, epithelial cells with a peripheral zone of columnar cells. No true acinus formation was seen, though foci of degeneration had given rise to pseudo-acini. Mitotic figures were frequent. The appearances were much more suggestive of a carcinoid tumour than of a carcinoma, though they were not altogether characteristic of the former.

On the third post-operative day it was discovered that the patient was leaking bile-stained fluid from her wound. Within a few hours a further operation was performed and a small leak from the anastomotic site was found and repaired. Despite repeated transfusions, she gradually became weaker, and died six days later. At necropsy localized peritonitis following leakage at the anastomotic site was found. Macroscopically there was no evidence of secondary growths, but microscopical examination revealed deposits in the liver.

Case 3

A man aged 43 was well until December, 1949, when he first noticed swelling of both ankles. This subsided spontaneously during the next few weeks. In October, 1950, he first complained of diarrhoea, characterized by four or five frothy, yellowish, watery stools a day. This continued intermittently for eleven months and he was admitted to the Royal Infirmary, Edinburgh, on September 14, 1951, for investigation. During the preceding months he had lost 42 lb. (19 kg.) in weight in spite of a reasonably good appetite. There was no history of abdominal pain. The family, social, occupational, and past histories revealed no information of diagnostic value.

On examination he was seen to be a thin, pale, middle-aged man. The tongue was atrophic. The respiratory, nervous, and cardiovascular systems were normal except for the presence of hypotension; his blood pressure was 90/60. The liver and spleen were not palpable and no abdominal masses were felt. He had gross clubbing of the fingers. There was minimal sacral oedema, but a moderate degree of bilateral ankle swelling. X-ray examination of the chest, urine analysis, and the stool benzidine test were negative. The initial blood count was haemoglobin, 69%; red cells, 4,600,000; colour index, 0.75; mean corpuscular volume, 86.9 μ^3 . The serum calcium was 7.7 mg. per 100 ml., and Trousseau's sign was positive. The serum sodium equalled 136 mEq./l. (312 mg. per 100 ml.); serum potassium, 4.1 mEq./l. (16 mg. per 100 ml.); plasma albumin, 2.37 g.%; and plasma globulin 2.21 g.%. Liver-function tests were negative. The Robinson-Kepler-Power water test gave a positive result. The glucose-tolerance curve was flat. 17-ketosteroid excretion was 8.4 mg. per 24 hours. A three-day fat-balance study showed that there was only 66% fat absorption and a barium meal gave evidence of a "deficiency" pattern.

About a month after admission the patient developed frank tetany with carpal spasm. This was relieved with antitetanic therapy, including calcium gluconate, "parathormone," and vitamin D. The Sulkowitch test consistently revealed the absence of calcium from the urine. A diagnosis of idiopathic steatorrhoea was made and he was given folic acid, 20 mg. daily, ferrous sulphate, 4 gr. (0.26 g.) thrice daily, multivitamin therapy, added salt (10 g. daily), and added protein ("casinal"), 100 g. daily. A total of 100 mg. of intravenous iron was given during his last week in hospital. At the time of his discharge (December 11) he was subjectively much improved. Moreover he had gained 28 lb. (12.7 kg.) in weight, the blood pressure had risen to 100/74 and the serum calcium to 11.3 mg. per 100 ml. The haemoglobin level was 77%. He was having only one or two stools a day and was completely free of oedema.

He returned to work during January and February, 1952, but had to stop because of weakness. In May he developed colicky abdominal pain which gradually increased in severity. Laparotomy was carried out in another centre, and a tumour of the ileum was found completely obstructing the intestinal lumen. Microscopically this was a reticulo-sarcoma which had invaded the adjacent mesenteric glands. The tumour was resected. Although relieved of his obstructive symptoms the patient continued to feel tired and was readmitted to the Royal Infirmary, Edinburgh, in September. The liver was now palpable three fingerbreadths below the right mid-costal margin and a chest x-ray film showed consolidation in the left lower lobe with a large hilar shadow on the left side, suggesting metastatic tumour formation. The patient has continued to become progressively weaker.

Summary and Conclusions

Two cases of tumour of the small intestine are presented in order to emphasize that an obscure anaemia may exist for months or years before obstructive symptoms occur, an abdominal mass is felt, or positive radiological evidence is obtained. The difficulty in arriving at an early correct diagnosis is evident. It is suggested

that the presence of a hypochromic anaemia, with a persistently positive stool benzidine test, the origin of which cannot be explained by clinical, instrumental, or radiological investigations, is an indication for laparotomy. If such an anaemia is refractory to oral iron therapy, this is an additional reason for operation, as it suggests that the loss of blood is of a degree that cannot be counteracted by iron therapy or that malabsorption of iron from the small intestine is occurring.

The third case is described because of the rarity with which the clinical and biochemical features of idiopathic steatorrhoea are associated with a neoplasm of the small intestine (Fairley and Mackie, 1937).

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THE SYNDROME OF HIGH-TITRE COLD HAEMAGGLUTINATION

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Occasional normal sera contain an antibody which agglutinates red cells in the cold, but it is usually present only in low titre. The physiological significance of this agglutinin is unknown and its presence is of practical importance only in blood transfusion work. A considerably raised titre of such a cold agglutinin is commonly found in cases of virus pneumonia, and rarely in a variety of unrelated conditions, including haemolytic anaemia, hepatic cirrhosis, and trypanosomiasis. In cases in which the titre is exceptionally high, exposure to cold may result in marked agglutination of red cells in the vessels of the extremities, with symptoms of vascular insufficiency. This is usually a transient phenomenon occurring at the height of the illness or during convalescence.

Cold agglutinins are, however, sometimes found in the blood of persons who have not suffered from any recent illness. They appear suddenly in very high titre and are persistent rather than transient. They give rise to a prolonged illness characterized by Raynaud's phenomenon, peripheral gangrene, intravascular haemolysis, haemoglobinuria, and anaemia.

We have recently had the opportunity of studying two further cases of this syndrome.

Case 1

A 47-year-old cycle-repairer noticed in the winter of 1950 that at times his hands became numb and blue up to the wrists and the fingers dead-white. After each attack he experienced abdominal discomfort and passed black urine. At no time was there numbness or cyanosis of the feet, but the tip of the nose often became blue, and this he recognized as a sign of an impending attack. He was careful to avoid exposure to cold, as he soon realized that

this was the cause of his trouble. However, during the autumn of 1951 further severe attacks occurred when out of doors in cold weather. Mild attacks of digital ischaemia without haemoglobinuria resulted from slight exposure to cold induced in his ordinary occupation by handling cold metal tools or bicycle components. There was no history of pneumonia or of any other serious illness, and until the onset of the present condition he had been able to work for long hours in cold surroundings without ill effects.

On admission to hospital there was no pallor of mucous membranes or any icterus. The skin of the distal segments of the digits was atrophic, but the colour was normal and all peripheral arteries pulsated strongly. The temperature was 98° F. (36.7° C.), pulse 90, blood pressure 138/86. He had bilateral direct inguinal hernias. Otherwise physical examination was negative. The urine contained no protein, red cells, or reducing substances, and there was no excess of urobilinogen. Renal-function tests showed normal excretion and radiological examination of the kidneys showed no opaque calculi.

Clinical Investigations

Exposure to Cold.—The patient was taken for a walk in the hospital grounds on a cold afternoon—temperature 42° F. (5.5° C.)—with the hands exposed. After 25 minutes both hands became numb and blue. Samples of blood were collected at hourly intervals after exposure; there was well-marked haemoglobinuria in the first specimen, but not subsequently. This haemoglobinuria was followed by haemoglobinuria, which was maximal two hours after the exposure to cold.

Rosenbach Test.—The right arm was immersed for 15 minutes in water at 54–57° F. (12–14° C.). Blood samples were taken immediately afterwards from both arms. The chilled hand showed ischaemic changes, but there was no oedema or allergic reaction to cold such as is seen in patients with syphilitic paroxysmal cold haemoglobinuria. Blood serum from the chilled limb was cherry-red, while that from the non-immersed limb was pink. Haemoglobinuria did not occur. The haemoglobin levels in the samples of serum are recorded in the Table, which also shows the results of similar experiments in Case 2 and in a case of syphilitic paroxysmal cold haemoglobinuria. Spectroscopic examination of serum from the chilled limb revealed no pigment other than oxyhaemoglobin, even in a thickness of 4.5 cm.

Results of Rosenbach Test

Case	Free Haemoglobin (mg./100 ml. Serum)		
	A	B	C
1	18	190	110
2	45	220	28
J.	19	250	47

Cases 1 and 2 suffer from high-titre cold haemagglutination, and J. from syphilitic paroxysmal cold haemoglobinuria. Column A=levels of free Hb in blood from right arm before its immersion in water at 54° F. (12° C.) for 15 minutes. Column B=levels of free Hb in blood from right arm following immersion. Column C=levels of free Hb in blood from left (non-immersed) arm.

Observations on the Vessels of the Chilled Conjunctiva.—The anaesthetized conjunctiva was examined in a warm room with a slit-lamp corneal microscope, and its circulation was noted to be normal. Following the direct application of ice to the conjunctiva the blood stream slowed and became fragmented, small clumps of cells alternating with stretches of clear plasma. On subsequent warming the circulation quickly became normal.

Examination of Nail-bed Capillaries after Chilling.—This was unsatisfactory, as the heat of the microscope lamp rapidly warmed the chilled finger-tip.

Laboratory Investigations

On admission the haemoglobin was 88% Haldane (13 g.%); erythrocytes, 4,120,000 per c.mm.; leucocytes, 9,950 per c.mm., with normal distribution; reticulocytes, 0.5–1%; platelets, 224,000 per c.mm.; E.S.R., 33 mm. in 1 hour at

72° F. (22° C.) and 31 mm. in 1 hour at 50° F. (10° C.) (Wintrobe method); osmotic fragility of erythrocytes normal. The blood group was O($\alpha\beta$) rhesus-positive (anti-D) and the Coombs test was strongly positive. Serum bilirubin was 0.8 mg. per 100 ml.; serum proteins, 6.7 g. per 100 ml. (albumin 4.55 g., globulin 2.15 g.). A differential count on marrow aspirated from the iliac crest showed a normal distribution with 24.5% normoblasts of all stages of development.

The Wassermann and Kahn reactions were negative. The serum contained a cold agglutinin active against his own and homologous erythrocytes to a titre which has remained persistently high during the period that he has been under investigation. When this test is carried out with normal saline as diluent the titre at 32° F. (0° C.) has been 1:20,480, but using bovine albumin as diluent the titre is enhanced many-fold, and has been as high as 1:327,680. The activity of this agglutinin falls sharply between 50 and 68° F. (10 and 20° C.) and is completely inhibited at body temperature.

Temperature	Titre	Temperature	Titre
32° F. (0° C.)	1:20,480	68° F. (20° C.)	1:1,280
50° F. (10° C.)	1:20,480	98.6° F. (37° C.)	0

No cold haemolysin could be detected in the serum using the technique described by Dacie and de Gruchy (1951).

The cold agglutinin was found to be absorbed on to the surface of erythrocytes collected from the patient's blood, which was allowed to clot at room or refrigerator temperature but not at 98.6° F. (37° C.). If these erythrocytes were repeatedly washed with warm saline the cold agglutinin was eluted from the cells. A Coombs test then carried out on such washed cells was found to give a positive result, which indicated the presence of an adsorbed cold immune body. The presence of this incomplete immune body can also be demonstrated by adding homologous cells to the serum, chilling the mixture, eluting the cold agglutinin with warm saline, and testing the washed cells with anti-human globulin serum, when a positive result is also obtained. This immune body is regarded by Ferriman *et al.* (1951) as an incomplete cold antibody, and is probably an enhanced titre of the incomplete cold antibody described by Dacie (1950a) in normal sera.

The Donath-Landsteiner test has been repeatedly carried out both without acidification and after adjusting the pH to 6.6. It has always been negative. A control Donath-Landsteiner test carried out on the serum of a patient with syphilitic cold haemoglobinuria has been persistently positive, and this reaction has been enhanced by acidification.

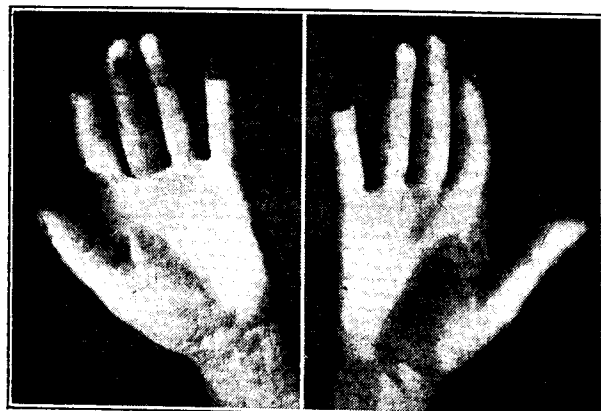
Treatment

The patient was advised to avoid unnecessary exposure to cold by wearing woollen mittens and remaining indoors as much as possible. In order to obtain peripheral vasodilatation tolazoline hydrochloride and nicotinic acid were given by mouth, but there was no evidence that they brought any lasting benefit.

Case 2

A 40-year-old fitter noticed during the winters of 1949 and 1950 that both hands became numb and painful during frosty weather. The hands were deeply cyanosed and the digits showed blue-and-white mottling; there was also cyanosis of the nose and ears, but the feet remained normal. During a cold spell in December, 1951, the tips of both the index and little fingers gradually became dry, black, and extremely painful. The only previous illness was pneumococcal lobar pneumonia in 1947, which had responded satisfactorily to chemotherapy.

On admission to hospital there was a moderate pallor of exposed mucous surfaces but no icterus. The hands showed mottled bluish discoloration, and the fingers were waxy-white, with shiny atrophic skin. Light touch and pin-prick were not appreciated. There was dry gangrene involving the distal segments of the index and little fingers of both hands (see illustration). Arterial pulsation was good in the radial and ulnar arteries, and there were no changes in the



Photograph of the hands of Case 2, showing symmetrical digital gangrene.

vessels or skin of the feet. The temperature was 97° F. (36.1° C.), pulse 84, blood pressure 180/90. No other abnormality was detected on clinical examination. The urine contained no protein, red cells, or excess urobilinogen; there was no haemosiderin in the urinary deposit. X-ray examination showed moderate enlargement of the left ventricle; there were no bony cervical ribs.

After nine days' treatment with local heat to the hands and vasodilator drugs there was no improvement in the gangrene, and the tips of both forefingers were amputated.

Clinical Investigation

Exposure to Cold.—Five days after amputation of the gangrenous finger-tips the patient was up and about in the ward, when he developed a severe attack of digital ischaemia. The amputation stumps were particularly painful, and the tip of the nose and right ear became blue. It was noted that pressure on an area of cyanosis failed to produce blanching (negative Parisius phenomenon). The pain and vascular changes were relieved after a few moments' immersion of the hands in water at 104° F. (40° C.).

Rosenbach Test.—As in Case 1, serum from the chilled limb contained a large amount of free haemoglobin (see Table). Spectroscopic examination showed, in addition to oxyhaemoglobin, a weak band at 630 mμ. It was mostly but not completely removed by bringing up to pH 9, and formed a small amount of haemochromogen (band 560 mμ) in Schumm's test. This could have been methaemoglobin mixed with a little methaalbumin, but the amount present was minute.

Observations on the Chilled Conjunctiva.—The changes following the application of ice to the conjunctiva were similar to those noted in Case 1.

Laboratory Investigations

Initially the haemoglobin was 57% Haldane (8.4 g.); erythrocytes, 2,650,000 per c.mm.; leucocytes, 7,350 per c.mm., with normal differential count; reticulocytes, 2.5%; osmotic fragility of erythrocytes normal. Sedimentation rates per hour determined by the Wintrobe method were: 50° F. (10° C.), 22 mm.; 72° F. (22° C.), 45 mm.; 98.6° F. (37° C.), 21 mm. The blood was group A(β) rhesus-positive (anti-D), and the Coombs test was positive. Serum bilirubin was 1.8 mg. per 100 ml.; serum proteins, 6.6 g. per 100 ml. (albumin 3.8 g., globulin 2.8 g.); thymol turbidity, 2.5 units; alkaline phosphatase, 9 (King-Armstrong) units; bromsulphthalein retention, 5% in 30 minutes. Sternal marrow showed normoblastic hyperplasia with a preponderance of intermediate forms.

The Wassermann and Kahn reactions were negative. An agglutinin active in high titre in the cold against the patient's own and homologous erythrocytes was present in the serum. It has been tested for on six occasions, and with a saline diluent the titre has been relatively fixed at 1:20,480. A higher titre was obtained using bovine albumin as diluent (1:81,920). The agglutinin is most active between 32 and

50° F. (0 and 10° C.), and its activity diminishes rapidly above 68° F. (20° C.)

Temperature	Titre	Temperature	Titre
32° F. (0° C.)	1:20,480	68° F. (20° C.)	1:1,280
50° F. (10° C.)	1:20,480	98.6° F. (37° C.)	0

On frequent testing no cold haemolysin could be demonstrated either with or without acidification of the serum, using the technique described by Dacie and de Gruchy (1951).

An incomplete cold antibody was also present in this serum as demonstrated by a positive Coombs test after elution of the complete cold antibody as in the previous case.

The Donath-Landsteiner reaction gave equivocal results. On two occasions it was negative even with acidification, but on two other occasions haemolysis occurred with acidified serum although all controls were negative.

Treatment

A course of 100 mg. of A.C.T.H. daily for six days produced no clinical or haematological remission. Urethane was then tried, and a total of 63 g. was taken over a period of three weeks. After ten days the titre had fallen to 1:2,048, but despite continuance of treatment the titre rose to its original level and there was no clinical improvement. Peripheral vasodilator drugs were given as in Case 1, and again had no effect. The only effective measure consisted in the avoidance of undue exposure to cold surroundings.

Discussion

The onset of the disease in both cases was characterized by the sudden spontaneous appearance of numbness and cyanosis of the hands during exposure to cold. These changes are produced by massive agglutination of erythrocytes in the blood vessels. This phenomenon can be demonstrated by examining the conjunctival vessels under the slit-lamp microscope after instilling iced water into the conjunctival sac (Iwai and Mei-Sai, 1925, 1926), when slowing and fragmentation of the blood column can be directly observed. That a similar process occurs in the extremities is inferred from the absence of blanching following pressure on the cyanosed fingers (negative Parisius phenomenon). Attempts to examine the nail-bed capillaries of the chilled finger directly with the capillary microscope were not successful, as the heat of the microscope lamp warmed the part and reversed the process of agglutination. Further observations carried out on our two cases have shown that the attacks of numbness and cyanosis of the hands can be adequately explained by intravascular haemagglutination (Marshall Shepherd, and Thompson, 1953).

When exposure to cold is excessively prolonged thrombosis may occur in the vessels distal to the blocked area. This is irreversible and when extensive enough leads to gangrene, which has been described as an unusual complication of high-titre cold agglutination by McCombs and McElroy (1937), Benians and Feasby (1941), Stats and Bullowa (1943), Carey, Wilson, and Tamerin (1948), and Ferriman *et al.* (1951). In our second patient, whose occupation entailed the handling of sheet-metal plates out of doors, prolonged exposure resulted in the development of symmetrical digital gangrene. Microscopical examination of the amputated finger-tips revealed thrombi, and such histological evidence as was available was consistent with these having been initiated by stasis.

It is surprising that the clinical symptoms are not always related to the titre of cold agglutinins. In the case recorded by Erf (1945) there were no symptoms directly referable to haemagglutination, although the titre was reported as 1:4,194,304. It may be that activity of this agglutinin in the body does not parallel that *in vitro*, or that, as Henne mann (1951) has suggested, the thermal amplitude of the antibody is the important factor in determining the occurrence of symptoms.

Exposure to cold causes not only intravascular haemagglutination but also haemolysis. This seems to be purely local phenomenon, and can be demonstrated by

chilling a single limb from which blood samples are collected before and after cooling (Rosenbach test). Stats and Bullowa found only oxyhaemoglobin in serum from the chilled limb, and concluded that simple haemolysis occurs without alteration of the blood pigment. Serum from one of our cases also showed oxyhaemoglobin alone, but in the other there was in addition a small amount of a pigment which may have been a mixture of methaemoglobin and methaalbumin. Although haemoglobinaemia in the single chilled limb is a constant feature in these patients, insufficient pigment enters the general circulation to produce haemoglobinuria during the performance of the Rosenbach test.

There is a wide divergence of views regarding the mechanism of haemolysis. It seems that intravascular stasis in small vessels contributes to haemolysis by allowing more time for the erythrocytes to agglutinate under the influence of cold, and that "cohesion of erythrocytes may lead to their prompt mechanical destruction while in motion in the circulation," as suggested by Shen, Castle, and Fleming (1944). This mechanistic concept is supported by the experiments of Stats (1945), who showed that when mixtures of sera containing cold agglutinins and homologous cells were shaken during refrigeration at 32° F. (0° C.) haemolysis resulted. In contrast with this theory of mechanical fragility, Dacie (1950b) claims to have detected the presence of a haemolysin in the serum. It is demonstrable only by altering the pH of the mixture to the physiological range or a little below it, and the titre is low. We have made repeated attempts, using an identical technique, to detect such a haemolysin in our two cases, but without success.

The anaemia found in patients with this condition is of the haemolytic type. It should be proportional to the extent of intravascular haemolysis as judged by the degree of haemoglobinaemia and haemoglobinuria. However, no distinct relationship between these manifestations and anaemia may be evident. In one of our cases there was well-marked anaemia in the absence of haemoglobinuria.

It is claimed by Benians and Feasby (1941), Helwig and Freis (1943), and Forbes (1947) that the E.S.R. increases when the test is performed at low temperatures owing to the enhanced activity of the agglutinins. However, Stats and Wasserman (1943) maintain that the increased viscosity of blood at low temperatures may retard the E.S.R., and this occurred in the patient reported by Mellinkoff and Pisciotta (1949). In Case 1 a reduction in temperature from 72 to 50° F. (22 to 10° C.) had no significant effect upon the E.S.R., but in Case 2 there was marked retardation.

The treatment of this condition is very unsatisfactory. Some authors have claimed that the use of vasodilator drugs has procured improvement in the Raynaud phenomenon, but in our cases they had no effect. Since there is no evidence that an excessive vasomotor tone contributes to the digital ischaemia, it is not surprising that sympathectomy failed to produce relief in the case recorded by Hanns (1943). The most effective measure consists in avoiding exposure to a cold environment by keeping the extremities well wrapped up and remaining indoors as much as possible during the winter. Attempts have been made to prevent the formation of cold agglutinins or to inactivate them, but without success. Bateman (1949) administered heavy doses of salicylates, which have been shown in animal experiments to be capable of blocking the antigen-antibody reaction, but there was no significant improvement either in the titre of cold agglutinins or in the symptoms. A short course of A.C.T.H. produced no change in one of our patients, and Ferriman *et al.* also noted no benefit from it. More prolonged treatment of the same case with urethane, undertaken in the hope of inhibiting the activity of the reticulo-endothelial system as a producer of immune bodies, was similarly without lasting effect.

Summary

Two cases are reported which readily developed the Raynaud phenomenon and intravascular haemolysis on

exposure to cold. One showed, in addition, bilateral symmetrical gangrene of the finger-tips and severe haemolytic anaemia, while the other was subject to attacks of haemoglobinuria. Examination of the serum of both cases revealed cold agglutinins in high titre. Treatment is unsatisfactory, and the only effective measure is the avoidance of cold surroundings.

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CONTINUOUS SUCCINYLCHOLINE CHLORIDE WITH PETHIDINE IN ABDOMINAL SURGERY

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The sequence of thiopentone, nitrous oxide and oxygen, and a relaxant and controlled respiration, aptly described by Gray and Rees (1952) as a pyramid having as its base apnoea with sides consisting of narcosis, relaxation, and analgesia, has for some time held an important place in anaesthesia for abdominal surgery. This technique produces excellent operating conditions, but the use of longer-acting relaxants such as D-tubocurarine chloride and gallamine triethiodide creates special problems, in particular the difficulty in controlling the duration of relaxation without the use of antidotes. The anaesthetist, faced with the problem of obtaining relaxation for peritoneal closure, is loath to give a further injection of a long-acting relaxant, and may use some less satisfactory alternative.

Even when relaxants are withheld during the latter stages of a major abdominal operation the patient is often left in a state of partial curarization, and the anaesthetist must either accept this or administer neostigmine. Here one encounters varying opinions, some advocating neostigmine in every case, some never. However, the decision to give or withhold neostigmine is a delicate one, and each case must be judged on its merits.

The side-effects of neostigmine, such as bradycardia, salivation, and vomiting, and the occasional occurrence

of collapse or bronchial spasm, all of which may occur in a patient well under the influence of atropine, make the routine use of this drug potentially dangerous, so that the antidote may well be more dangerous than the condition for which it is given. Macintosh (1949) and Clutton-Brock (1949) report two fatalities immediately after the injection of neostigmine at the end of operation. On the other hand, the patient who is allowed to return to the ward in a partially curarized state following an abdominal operation may become critically hypoxic and later develop pulmonary complications.

The short-lived but potent action of succinylcholine should make it an ideal agent for prolonged relaxation in abdominal surgery when given by intravenous drip. Thesleff and von Dardel (1951) used the iodide by this method in a series of 132 operations, mainly abdominal, employing a 0.1% solution at a rate of 2 to 8 mg. a minute in patients whose ages varied from 11 to 70 years. They did not aim at complete apnoea, but found muscular relaxation excellent. No toxic effects were noted, even in poor-risk patients. Bourne, Collier, and Somers (1952) used succinylcholine chloride ("scoline") for abdominal relaxation in 68 cases, an unspecified number of which were by continuous drip. They thought the method cumbersome and found that a steady rise in blood pressure often occurred and that respiration was sometimes slow to recover. Foldes (1952), however, criticized what he thought to be the excessive dosage used by these and other British workers, stating that adequate relaxation without apnoea could be obtained with approximately one-fifth of the dosage used in this country. Green (1952, 1953) had good results in 146 abdominal operations, using a 0.1% solution and giving a test dose to the conscious patient. Apart from the initial thiopentone, he used only nitrous oxide for maintenance of anaesthesia, and stressed the need to effect early saturation, a point well demonstrated earlier by Brennan (1952).

In the present series of 289 abdominal operations the sequence of thiopentone, nitrous oxide, continuous succinylcholine chloride, and intermittent intravenous pethidine was used. After some experiment, a 0.15% solution of succinylcholine in normal saline was decided upon as giving simple control without excessive fluid, 750 mg. being added to 500 ml. of saline in the usual transfusion bottle. Most of the patients were adults, but the ages varied from 14 to 82 years.

Description of Technique

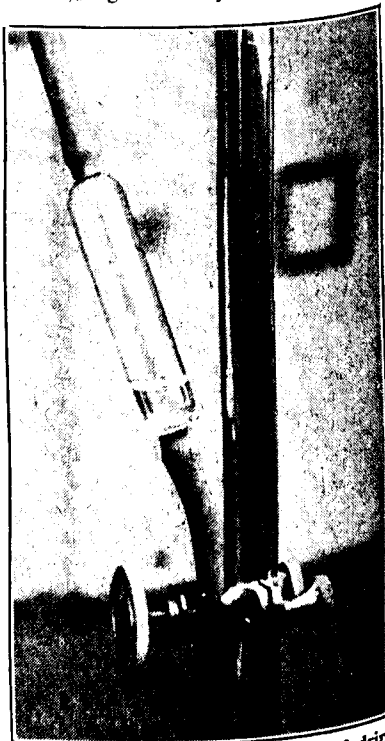
Fit adults received "omnupon," 1/3 gr. (22 mg.), and scopolamine, 1/150 gr. (0.43 mg.), one hour before operation. Elderly or seriously ill patients were given atropine,

1/100 gr. (0.65 mg.), with or without a small dose of morphine. Thiopentone, 0.3 to 0.5 g.—a dose which need rarely be exceeded—was followed by 40 to 50 mg. of succinylcholine, and the succinylcholine drip was then started through the same needle, preferably not smaller than size 12, just fast enough to prevent clotting. In one patient to whom a test dose of succinylcholine was given before thiopentone painful muscular contractions resulted, and the method was therefore abandoned.

After inflation of the lungs with oxygen, the cords and trachea were sprayed with 4% lignocaine hydrochloride, and in most cases a cuffed tube was then passed orally. For the next 10 to 15 minutes the patient was hyper-ventilated with 6 litres of nitrous oxide to 2 litres of oxygen, and the succinylcholine drip was speeded up sufficiently to keep the patient just apnoeic. This is an adjustment of some delicacy and one greatly facilitated by the use of a drip control attached directly to the upright of the drip stand and actuated by a large milled head, as shown in the photograph. This arrangement was specially useful to the single-handed anaesthetist engaged in manipulating the bag.

When saturation with nitrous oxide was considered adequate, the closed circuit was used with 1 litre of nitrous oxide to approximately 300 ml. of oxygen and an intentional leak in the circuit. Before the peritoneum was opened 10 to 20 mg. of pethidine was given, and this dose was repeated at the most traumatizing stages of the operation, particularly in gastrectomies and other major abdominal procedures. The succinylcholine drip was stopped as the peritoneum was being closed.

Details of the operations, together with the average doses of thiopentone, succinylcholine, and pethidine, and the average times taken to resume breathing, are shown in the accompanying Table.



Drip control attached to upright of drip stand.

Operation	No.	No. of Emergencies	Average Age	Average Length of Operation	Average Dose of			Average Time to Start Breathing after Stopping Drip	Average Time to Resume Normal Breathing
					Thiopentone	Succinylcholine	Pethidine		
Partial gastrectomy	42	4	50	Minutes	g.	mg.	mg.	Minutes	Minutes
Cholecystectomy	20	—	49	94	0.4	650	65	1.9	5.8
Splenectomy	6	—	48	48	0.4	350	35	1.9	6.0
Prostatectomy	11	—	64	45	0.35	300	35	2.5	3.0
Appendicectomy	30	16	35	40	0.35	350	30	1.0	4.0
Hysterectomy	40	—	35	30	0.35	200	35	1.0	4.0
Wertheim's hysterectomy	4	—	44	72	0.45	620	25	1.5	4.5
Miscellaneous gynaecological	32	8	50	150	0.45	1,150	36	2.6	13.0
Caesarean section	11	—	43	55	0.4	420	75	4.0	6.0
Intestinal obstruction	18	18	50	40	0.3	300	30	3.5	3.0
Perforated peptic ulcer	5	5	55	62	0.35	320	25	0.6	6.0
Hernia	15	2	52	25	0.3	200	30	2.0	4.0
Bladder operations	4	—	62	46	0.45	200	25	1.5	2.5
Closure of colostomy	4	—	58	38	0.4	376	25	1.5	4.5
Others	47	6	52	55	0.35	190	30	0.25	2.5
Total	289	59				300	35	2.0	4.5

Advantages and Disadvantages

Advantages of Pethidine.—Although a few early cases in the series were maintained on nitrous oxide, oxygen, and succinylcholine alone, the occasional slight movement of a limb or eyelid showed that analgesia was not adequate. The use of small doses of pethidine has, in our experience, prevented such reflex disturbances, has diminished appreciably the amount of succinylcholine required, and has, by providing analgesia with little narcotic effect, contributed materially to the good post-operative condition of the patient. Moreover, its action as a bronchodilator facilitates inflation of the lungs.

Use of the Cuffed Tube.—Succinylcholine provides such perfect intubating conditions that an oral cuffed tube can be passed easily and leisurely. While this was done in all lengthy operations, or in those in which there was any risk of regurgitation of stomach contents, equally good results were obtained by one of us (E. J.) using a simple airway in shorter non-emergency operations such as appendicectomy and herniotomy. However, in view of the possibility of inflating the stomach during hyperventilation, we think that most anaesthetists would prefer to have an endotracheal tube in position.

Indications and Contraindications.—The cases in this series comprise a fairly representative selection of abdominal operations, in all of which extremely good operating conditions were provided. Some of the cases used in this trial were of rather short duration, and, while the method produced ideal conditions for appendicectomies and herniotomies, it should perhaps be reserved for cases in which surgical difficulty is anticipated. Again, a single appendicectomy will probably be over too quickly to justify its use, but where the operation is one of a list, there is no greater difficulty in setting up the succinylcholine drip than in giving repeated injections of *n*-tubocurarine or other relaxant. However, we found that the method was seen to its best advantage in the more lengthy and extensive abdominal operations—for example, gastrectomy, hemicolectomy, and cholecystectomy. In emergencies, too, it was found that the method gave excellent operating conditions, and that the patient's condition at the end of operation was most satisfactory.

Some Special Cases

Eleven cases of caesarean section (lower segment) were anaesthetized by this technique. In one of them the infant was lively and cried immediately, while the mother's condition was excellent. In another case, a toxæmia of pregnancy, anaesthesia was induced with 0.35 g. of thiopentone, and the infant was sleepy and did not cry for five minutes. It was thought that the induction dose of thiopentone was rather high in this case, and that this was responsible for the sleepy condition of the infant.

For gynaecological operations in which the surgeon was satisfied with a moderate Trendelenburg position, the technique was found satisfactory, but where the maximum table tilt was used the technical difficulty of maintaining the succinylcholine drip made the method scarcely worth while. One patient, a very fat woman of 61 undergoing a Wertheim's hysterectomy, required 1.5 g. of succinylcholine in two and a half hours. Although respiratory movements returned within three minutes of stopping the drip, the respirations remained shallow and diaphragmatic in type for a further twenty minutes. Apart from oxygen no special treatment was given, and at the end of this time the respirations had become normal and recovery was uneventful. This is the longest time noted in the series for the return of normal respiration.

A few cases not included in this series have been given continuous succinylcholine for haemorrhoidectomy. Here again operating conditions were excellent, but in one case (a muscular man of 41) the surgeon stated that the anal sphincter was not relaxed, although it was noted at the

time that there was perfect relaxation of the abdominal wall. This is the only case in which failure of relaxation with succinylcholine has been noted. Clearly, however, haemorrhoidectomy is too short an operation to justify the use of a drip, and intermittent injection of succinylcholine would appear to be more suitable.

An Emergency Laparotomy

This case is cited to show that the technique can be used successfully, even in grave emergency, provided that only minimal quantities of anaesthetic and relaxant are used.

The patient, a woman of 59, was admitted in a moribund condition following severe haematemesis, which had been preceded for some weeks by vague dyspeptic symptoms. The blood pressure on admission was not recordable, and her respiration was gasping in character. After a rapid transfusion of 4 pints (2.3 litres) of blood, however, the general condition improved slightly, and the surgeon considered that operation offered the only hope of arresting the bleeding. Just before operation the systolic blood pressure was 50 mm. Hg and the pulse rate 120. Anaesthesia was induced with 0.15 g. of thiopentone followed by 20 mg. of succinylcholine. After a cuffed oral tube had been passed, anaesthesia was continued with a 50% mixture of nitrous oxide and oxygen. The patient was apnoeic for only two minutes at the start—perhaps a tribute to the cholinesterase content of fresh transfused blood—and was kept apnoeic during the 60 minutes of the operation by 100 mg. of succinylcholine. Pethidine was not given. Laparotomy showed a cirrhotic liver, a stomach distended with clotted blood, and large freely bleeding oesophageal varices. Attempts to arrest the bleeding were only temporarily successful, but the pulse rate and blood pressure remained almost unchanged throughout the operation. Respiration started almost as soon as the succinylcholine drip was stopped, and was adequate within three minutes. The patient died one hour after operation from fresh and massive haemorrhage.

Characteristic Effects of Continuous Succinylcholine

In these cases the relaxation of the abdominal wall was always excellent, and the peritoneum during closure was described by one surgeon as "hanging in festoons." A few patients, for purposes of observation, were allowed to breathe spontaneously for a short time, but we found that respirations of any depth were accompanied by the return of tone in the lateral muscles of the abdominal wall. The work of Gray and Rees (1952) and Dundee (1952), who demonstrated the effect of controlled respiration in decreasing the dosage of thiopentone and relaxant, would seem to apply equally well to succinylcholine.

Bleeding in these cases was described by the surgeons as moderate, with little tendency to oozing. Many of the patients awoke on the table, and the others had active reflexes within a very short time. As stated above, post-operative analgesia was provided by the pethidine, and there was little tendency to restlessness. The post-operative condition of the patients was good, and there was very little deterioration during the immediate post-operative period, in contrast to the picture often seen when cyclopropane, or to a lesser extent ether, are withdrawn. The pulse rate tends to remain slow and stable both during and after operation, in contrast to the characteristic changes seen with cyclopropane, gallamine triethiodide, and neostigmine. No case of arrhythmia was observed. The blood pressure sometimes showed an initial fall, ascribed to the thiopentone, followed by a rapid restoration to the normal level. Where pethidine was not used, as in some of the very early cases, the climbing type of blood-pressure chart was sometimes met with, especially in long gastrectomies, and this in spite of adequate lung ventilation. With pethidine, however, this picture was not seen, and the blood-pressure charts pursued a constant course.

The most pleasing observation in these cases has been the spontaneous return of normal respiration within a few minutes of cessation of the drip, although the peritoneum has been perfectly relaxed for closure. The average time taken for the return of respiratory movements in these cases has been one and a half minutes, with a further period of two and a half minutes before full normal intercostal breathing returned. The figures showed considerable individual variation, but the impression was formed that in those cases which took longer than usual to start respiratory movements the return of normal respiration was quicker. No doubt the dosage of thiopentone, pethidine, and succinylcholine, and the degree of ventilation of the lungs, all influenced these figures, but the relative importance of each of these factors in prolonging apnoea is difficult to assess.

Summary

A technique for anaesthesia in abdominal surgery is described, using thiopentone, succinylcholine by continuous drip, intermittent pethidine, and controlled respiration with nitrous oxide and oxygen.

The succinylcholine drip gives a flexibility of control not obtainable with other relaxants, while respiration is quickly restored after the drip has been stopped. No case of prolonged apnoea has been met with. Given a well-trained nurse, the method is no more cumbersome than repeated injections of D-tubocurarine or other relaxant, even for the single-handed anaesthetist.

The technique is suitable for both planned and emergency abdominal surgery, in both fit and seriously ill patients.

The use of pethidine minimizes reflex disturbances and adds greatly to the post-operative well-being of the patient.

Thanks are due to our surgical and theatre nursing staff colleagues at Rush Green and Wanstead Hospitals, and particularly to our resident anaesthetists Dr. M. O'Callaghan, Dr. Pramanik, and Dr. W. R. Lamb.

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The Alcoholic Research Foundation, Toronto, was set up to conduct and promote research in alcoholism and the treatment and rehabilitation of alcoholics. Its annual report for 1952 gives an account of treatment methods and problems. In dealing with alcoholism of psychological origin the Foundation advocates informal group sessions under the direction of a psychiatrist and consisting in the exchange of experiences, attitudes, and knowledge by the participants. Many patients make real progress from this method. Others have been helped more by short interviews of 5-10 minutes. "Antabuse" continues to be used, although many who might be helped by it are dissuaded from taking it through previous misinformation. In employing antabuse no use has been made of the trial reaction with alcohol after the patient has been on the drug for a few days; it is considered unnecessary to use this test now that clear information is available to the patient. According to the report, there is room for more careful screening and instruction of patients on the use of antabuse if it is to give the maximum benefit. One problem causing concern is the increasing use of sedatives of the open chain ureide group, to which patients often become habituated.

AN UNUSUAL CASE OF SYPHILITIC PARKINSONISM

BY

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Although the recent literature on syphilis as a cause of Parkinson's syndrome is scant, it is an accepted fact that *Treponema pallidum* can cause the features of this condition (Guillain, 1935; Kinnier Wilson, 1940). The signs of involvement of the basal ganglia may appear soon after the original infection or may be delayed for some years. Pires (1935) reports the case of a man aged 32 who had a primary chancre five years previously, and three months after finishing a course of arsenic and bismuth injections developed rigidity in the right arm, pill-rolling movements of the fingers, and loss of facial expression.

Cases of Parkinson's syndrome combined with tabes dorsalis or general paralysis have also been recorded (Chavany and Levy, 1926; Dumas *et al.*, 1928; Urechia and Retezeanu, 1936b).

Urechia and Retezeanu (1936a) describe the case of a young woman, aged 24, whose first symptoms were uselessness of the hand for five minutes after she got out of bed in the mornings. She developed a typical Parkinsonian facies later on. This case was of particular interest in that the blood Wassermann reaction was negative but the cerebrospinal fluid Wassermann reaction was positive.

Cases of oculogyric crises, in association with other Parkinsonian features due to *T. pallidum*, are recorded by Pearson (1927) and Cossa *et al.* (1936).

The following case of syphilitic Parkinsonism seen at this hospital is of particular interest in that the patient, aged 43, appears to be a congenital syphilitic. The Parkinsonian features were well marked and were progressing. A survey of the literature failed to reveal a similar case.

Case Record

A professional fur classer aged 43 had not felt really fit since the removal of a papilloma of the bladder two years previously. Soon after discharge from hospital he began to feel tired in the daytime. During the past six months there had also been a great decrease in his usual energy and he had become rather depressed. Shortly before admission he noticed that his hands were shaking (especially the right) and he had difficulty in writing properly. The writing had become small and the letters were poorly formed. About this time his speech had become thick and slurred. There had been a tendency to fall over, particularly when he went out at night or closed his eyes. He had noted that his method of walking had become shuffling and that his arms had ceased to swing. At times he had difficulty in stopping once he had started walking. Dribbling of saliva was often excessive, particularly at night-time.

For the past two years he had had very severe pain in his right lower leg. He described it as "like a hot knife being pushed through the leg." The pain was always transversely through the leg, never vertically. It nearly always came on when he was in bed at night.

Previous Complaints and Illnesses.—As a baby he was said to have had a troublesome nasal discharge. The two upper permanent central incisor teeth were said to have been peculiar, in that they were shorter than the others and decayed early. He had a severe infection of the eyes at the

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age of 18, and was almost blind for four months. He attended a London eye hospital and received a course of twenty-eight intramuscular injections. There had been no recurrence. The old hospital notes of his own doctor said that he had interstitial keratitis. He denied ever having had sexual intercourse with anyone but his wife, and there was no history of a chancre, skin rash, or other syphilitic manifestation.

Unfortunately, no satisfactory history of his parents was available. His wife and his son, aged 18, are well. Their blood Wassermann and Kahn reactions are negative. On admission he complained of tiredness, especially during the day, but inability to sleep and restlessness at night, dribbling of saliva, trembling of the hands (particularly the right), difficulty in walking properly, and a tendency to fall over.

On examination he was seen to have a typical mask-like, expressionless Parkinsonian facies. Speech was slow and slurred, and saliva dribbled from the corners of his mouth. He had a slight stoop and a shuffling gait, and did not swing his arms.

Nervous System.—Cranial nerves: the following abnormalities were noted. He had slight diplopia at times. The pupils, which did not react to light and reacted minimally to accommodation, were large, irregular, and unequal. The edge of the iris was hazy and irregular. There was slight lateral nystagmus, with a fine tremor of the closed eyelids. A fine tremor of the jaw was present. Ophthalmoscopic examination showed slight pallor of the temporal sides of the disks. The vision and fields were normal.

Limbs.—Power and co-ordination were normal, but there was slight bilateral rigidity, and a fine pill-rolling movement was present in both hands, particularly the right. Although there was no loss of power in the lower limbs, a marked degree of ataxia was present. This was particularly evident when he attempted to slide the right heel down the anterior surface of the left tibia. The reflexes in the arms were all excessively brisk. The knee-jerks were exaggerated, particularly the left. The ankle-jerks were present but not exaggerated. The left plantar response was flexor and the right extensor. The abdominal reflexes were normal. The sensations of touch, temperature, pain, and vibration sense were normal in the arms and legs. Position sense in the arms and left leg was normal, but in the right great toe it was grossly impaired. A marked degree of Rombergism was present. No abnormalities were found in the sphincters. Testicular sensation was normal and there were no areas of cutaneous anaesthesia of the face, forehead, or chest.

The cardiovascular system was normal. The blood pressure was 140/90. The respiratory, genito-urinary, alimentary, and lymphatic systems were normal. The chest x-ray film showed nothing abnormal.

Laboratory Investigations.—Blood: haemoglobin, 102% (15.1 g. per 100 ml.), E.S.R., 2 mm. in one hour (Westergren); white cells, 5,700 (normal distribution); Wassermann reaction and Kahn test, strongly positive. Cerebrospinal fluid: appearance clear (pressure 140 mm.); protein, 110 mg. per 100 ml.; globulin, excess present; chlorides, 700 mg. per 100 ml.; sugar, 65 mg. per 100 ml.; leucocytes, total 16 per c.mm.; lymphocytes, 100%; Gram stain, no organisms; culture, no growth; Lange, 5554320000; Wassermann reaction, strongly positive. X-ray films of the skull, right and left tibiae, knees, hands, wrists, and chest were normal.

Treatment.—The patient was given a course of 10,000,000 units of penicillin, 30,000 units of soluble penicillin three-hourly for 48 hours, followed by 600,000 units of procaine penicillin daily. Within a few days of starting the penicillin an obvious improvement in his general condition was noted. After receiving the full course he was discharged.

When examined one month later he no longer felt sleepy during the day, and at night he had eight hours of undisturbed sleep. He felt more energetic than before treatment,

and no longer dribbled saliva. There was only slight residual trembling in his hands, and he could write reasonably well again. He was able to stand with his eyes shut without feeling unsteady and could go out at night without fear of falling over. He has had no further diplopia. There have been no further lightning pains. His facial expression, however, was still somewhat mask-like, he still walked with a shuffling gait, and his arms moved only a little. There was, however, a considerable improvement compared with his condition before treatment started.

Discussion

This patient had typical Parkinsonian signs, a mask-like face, slow monotonous speech, tremor of the closed eyelids, rigidity and tremor of the arms, and a characteristic gait, but there were several unusual features. Irregular pupils with no reaction to light and a poor contraction on accommodation may occur in Parkinsonism, particularly the post-encephalitic type, but exaggerated tendon-jerks and extensor plantar response, impairment of position sense in the right big toe, a positive Romberg sign, and lightning pains in the legs are not part of the clinical picture of the disease. The past history of interstitial keratitis suggested the possibility of congenital syphilis, and the presence of syphilitic involvement of the nervous system was confirmed by the excess of lymphocytes and the raised protein content in the cerebrospinal fluid, the first-zone Lange curve, and the positive Wassermann reaction in the blood and cerebrospinal fluid.

Neurosyphilis and Parkinson's disease are both fairly common disorders, and the association of the two conditions in the same patient may at times be coincidental (Schaeffer and Bize, 1935; Kinnier Wilson, 1940). In this patient, however, the improvement in the Parkinsonian features following treatment with penicillin suggests strongly that the syphilitic infection of the nervous system was the cause of the Parkinsonian syndrome as well as of the other neurological signs. The syphilitic infection was in all probability congenital, and the development of neurological involvement occurred at an unusually late age. It is possible that the course of treatment which was given at the age of 18, when he had interstitial keratitis, though inadequate to control the infection completely, was enough to delay the appearance of neurological involvement.

There is little doubt that acquired syphilis can occasionally cause a Parkinsonian syndrome. Stevenson and Allen (1937) record a case resembling the present one, but with the addition of considerable mental deterioration, in which post-mortem examination showed typical changes of dementia paralytica in the cortex, together with widespread lesions in the corpus striatum and its connexions. Mella and Katz (1924) also record typical mesodermal syphilitic involvement of the basal ganglia. Their case was that of a man aged 46 who was admitted to hospital with a diagnosis of "paralysis agitans." He gave a history of a chancre ten years previously. His blood Wassermann reaction was positive. The cerebrospinal fluid Wassermann reaction was negative. No other tests were done. He died in hospital with bronchopneumonia. At the post-mortem examination two types of microscopical lesions were found: a perivascular infiltration of round cells and rod cells in the globus pallidus, and nerve-cell degeneration. The first is indicative of neurosyphilis, and this was further borne out by the gross findings of chronic leptomenigitis, atrophy of frontal convolutions, and granulations in the fourth ventricle which are pathognomonic of neurosyphilis. Although Mella and Katz suggest that the neurone changes may be secondary to vascular changes, they point out that the neurone change may be a primary one like that found in pre-senile paralysis agitans, and that two pathological processes are going on at the same time without any definite association.

Cases of a Parkinsonian syndrome occurring in the thirties and forties without a previous history of lethargic encephalitis are not uncommon, and the possibility of syphilis as the cause should be considered, especially if there

are unusual neurological signs such as were found in the present case; in this event, adequate antisyphilitic treatment may help in averting further progress of the disease and bring clinical improvement.

Summary

A case of the Parkinsonian syndrome apparently due to congenital syphilis is described. The response to treatment has been satisfactory.

Although syphilis is a rare cause of the condition it should be considered when the Parkinsonian syndrome develops in the 30-50 age group, particularly if there are any anomalous clinical features.

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Medical Memoranda

Fatal Suppurative Cholangitis without Obstruction

Acute suppurative cholangitis is almost unknown, save in the presence of chronic biliary obstruction or of intrinsic disease of the bile ducts. Rogers (1903) found gall-stone obstruction in 18 out of 20 cases. The following case is recorded because of the occurrence of fatal suppurative cholangitis in the absence of recognized obstruction or of antecedent jaundice.

CASE REPORT

A housewife, aged 65, previously in good health, noticed slight, painless distension of the upper abdomen in July, 1952. This was accompanied by some flatulence but no other dyspeptic symptoms. Three weeks later she had sudden violent abdominal pain while out walking. The pain was in the epigastrium and right hypochondrium, and was of such severity that she went straight home to bed. Antacids, hot water, and local heat all failed to relieve it, and it was aggravated by lying on her left side. The next day she felt feverish, anorexic, and nauseated, and sweated profusely. No rigors were described. Her urine became darker than normal, but the colour of the stool was unchanged. Her doctor then found she was pyrexial, and very tender to palpation, with "guarding" over the whole upper abdomen. The pain persisted, constant in intensity, without remission. Four days after the onset two attacks of vomiting occurred, and on examination a tender hepatomegaly and persistent pyrexia were found. She was not jaundiced. The next day she was admitted to hospital.

On examination she was drowsy but conscious, in obvious pain, and moderately dehydrated. Feter hepatitus was present. She lay on her right side with her knees flexed. She was not jaundiced. A few cutaneous petechiae were present, together with several De Morgan spots. The cardiovascular system was normal. The blood pressure was 130/80, but ocular fundi showed grade 2 hypertensive retinopathy. The liver was enlarged to 7 cm. below the

right costal margin; it was exquisitely tender, and had increased in firmness; its margin was difficult to define. Gall-bladder enlargement was not present. Splenomegaly and ascites were not present, and rectal examination was negative. The urine gave a position reaction for bile constituents.

Investigations.—Blood: Hb, 102% Haldane (15.1 g.%); white cells, 12,700 per c.mm., with 92% polymorphonuclear leucocytes, showing a "shift to the left"; serum van den Bergh, direct reaction positive; serum bilirubin 1.3 mg. per 100 ml.; alkaline phosphatase, 20.5 units per 100 ml.; thymol turbidity, 2 units; serum proteins, total 4.75 g.% (albumin 2.8 g., globulin 1.95 g.); blood urea, 440 mg. per 100 ml. Urine: bile salts and urobilinogen present; albumin, 70 mg. per 100 ml.; large numbers of erythrocytes and pus cells present; culture yielded a heavy growth of *Bact. coli*. Stool: benzidine test strongly positive. A hepatic puncture biopsy, subsequently taken with a Terry biopsy needle, showed the characteristic changes of acute suppurative cholangitis.

No pyrexia occurred while under observation. A diagnosis of acute hepatitis with cholaemia and uraemia was made. Treatment consisted of intravenous administration of dextrose, saline, and water, later followed by Latner's intravenous regime for acute hepatic failure.

Five days after admission the patient's general condition showed further deterioration, with the development of drowsiness, disorientation, and minimal icterus. The skin of the abdominal wall and upper arms showed dusky purpuric blotches. Menaphthone (vitamin K₁), 10 mg., was given intramuscularly preparatory to hepatic puncture biopsy. A few hours later she collapsed and died.

At necropsy, 18 hours later, the lungs showed early pulmonary oedema. No bronchopneumonia or abscess formation was present. Many subpleural ecchymoses were present over both lungs. The cardiovascular system showed no abnormality beyond mild atheroma. The brain and meninges were normal. The oesophagus, stomach, and rest of the intestines were normal, except for a few diverticula of the sigmoid colon; these were not inflamed. There was no inflammation of the appendix or inflammatory lesion of the rectum. A fairly large blood-stained ascitic effusion was present. A large blood clot (approximately 300 ml.) was present in the peritoneal cavity in the region of the hepatic flexure and right lobe of the liver. The liver was large (2,720 g.). Three small puncture marks were present in the right lobe, but no tearing. A cut surface of the liver showed numerous small abscesses, containing yellow or occasionally greenish-coloured pus. Abscess walls showed recent inflammatory tissue. The gall-bladder was distended and thin-walled, and contained bile and several small and medium-sized black gall-stones. The bile was slightly turbid but not frankly purulent. The common bile duct was patent and appeared normal. Culture of the gall-bladder bile yielded a profuse growth of pure *Bact. coli*. The appendix and rectum were normal. The pancreas, kidneys, and urinary tract showed no abnormality.

The haemorrhagic ascites was attributed to bleeding from the site of the hepatic puncture biopsy—a matter of some interest in view of the frequency with which this investigation is nowadays carried out.

COMMENT

I have been unable to trace a necropsy-proved case of non-obstructive acute suppurative cholangitis, save in the presence of artificial regurgitation of chyme, as a post-operative phenomenon—for example, in cholecystgastrostomy (Zaslow and Counsellor, 1946; Cole, 1947). A single case was described by Bassler (1937) in which no obstruction was discovered during laparotomy with exploration of the bile duct: this patient recovered.

On the other hand, chronic infective cholangitis without clinically recognizable jaundice and biliary obstruction is well known. It takes a remittent course without suppuration, and may be but one manifestation of an underlying "cholangitis

lenta" (Schottmüller, 1921) as a separate entity. This "low-grade" cholangitis is recorded in the enteric fevers and bacillary and amoebic dysenteries (Umber, 1929; Lyon, 1932), but many observers doubt its existence as an entity. Grant (1945) drew attention to the difficulty of excluding calculi in the relatively inaccessible retroduodenal portion of the common bile duct.

The frequent absence of jaundice in this group was attributed by Weiss (1944) to the essentially chronic nature of the infection: "owing to inflammatory changes the hepatic system of lymphatics—which would otherwise carry the bile into the general circulation—becomes impermeable and consequently jaundice fails to appear." Virulent infection is generally believed to depend on the factors of biliary stasis and diminished resistance of the duct epithelium.

It would seem possible that in this instance a fulminating ascending infection occurred during the passage of a "silent" gall-stone. Closer examination of the bowel contents might have revealed such a stone in the process of evacuation.

I have to thank Dr. J. S. Richardson for permission to publish this case under his care, and Dr. C. Pike for the account of the morbid anatomy.

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Carcinoma of the Submandibular Gland

A man aged 60 was admitted to hospital complaining of a painless swelling of the lower jaw of twelve months' duration which had enlarged rapidly during the four months preceding admission.

On examination a solid mass 6 by 5 cm. was present at the lower border of the body of the mandible on the right side. The mass, tender to pressure, was firmly fixed to the mandible and the overlying skin. The floor of the mouth was infiltrated, there was no discharge from the right submandibular duct, and the related cervical lymph nodes were not enlarged.

Investigations.—A white-cell count was within normal limits; the Wassermann and Kahn reactions were negative. Radiographic examination of the mandible showed a translucent area with well-defined margins in the left premolar region suggestive of a cyst. There was slight bone absorption of the right half of the mandible in the region of the tumour, the impression being that of a tumour outside the jaw invading it or causing bony resorption. Immediately anterior to this area was an outgrowth of dense bone on the external aspect of the mandible. A chest radiograph did not reveal the presence of secondary deposits. The tumour was thought to be a primary malignant neoplasm of the submandibular gland, and radical excision was advised.

Operation.—Under thiopentone, oxygen, and cyclopropane anaesthesia with an endotracheal tube, a preliminary ligation of the external carotid artery was performed and the tumour excised, together with that portion of the mandible extending from the symphysis menti to just below the coronoid and condyloid processes.

Pathological Report.—The specimen consisted of the right half of the mandible, excluding the upper part of the ramus. Apparently arising from the body of the mandible was a large tumour mass causing swelling on both the external and internal aspects. Over the external aspect was an elliptical portion of skin measuring 5 by 4.5 cm. The cut

surface of the tumour appeared white and fleshy. **Microscopical Examination.**—The tumour is a cystic type of squamous-cell carcinoma of the submandibular salivary gland, with adamantinoma-like structure in places. It is arising from the larger ducts and is invading the adjacent muscle. There is no evidence that the tumour arose from the skin or skin glands. Sections of the decalcified mandible showed osteoclastic absorption of the cortex (due to compression) with no evidence of origin of the tumour from the enamel organ or enamel organ rests.

When seen six months after operation a local recurrence was present in the neck and had produced ulceration of the overlying skin; dysphagia and pain in the neck had been present for five months. Nine months after operation the patient died as a result of haemorrhage from the internal carotid artery.

COMMENT

In a review of 150 cases of salivary gland tumours treated at the Lahey Clinic, Marshall and Miles (1947) found only 12 cases in which the submandibular gland was affected; 11 of these were cases of mixed tumour, and in the other the glandular enlargement was due to lymphadenoma.

Dockerty and Mayo (1942) reviewed 500 cases of submandibular tumours at the Mayo Clinic and found only 81 primary malignant neoplasms. These were classified into four groups: (1) Adenocarcinoma of mixed tumour type (51); the capsule was often thin and frequently invaded; 14 cases showed squamous-cell metaplasia. (2) Cylindroma type (15); most were associated with marked capsular invasion, tissue infiltration, and invasion of perineural lymph spaces; 30% of these cases showed lymph-node metastasis; 80% were associated with local recurrence after removal; 50% of the patients died within five years. (3) Intermediate type (7): these showed a histological picture with features both of adenocarcinoma and of cylindroma, but clinically were highly malignant, showing extensive metastasis. (4) Miscellaneous tumours (8): these included such neoplasms as papillary adenocarcinoma, primary epidermoid carcinoma, and other atypical tumours demonstrating none of the features of mixed tumours or cylindromata.

Stanford Cade (1949) stated that the value of pre-operative radiation, while accepted at Radiumhemmet and the Memorial Hospital, New York, has been doubted in this country. In his own experience the treatment of choice is pre-operative radiation followed by wide excision, only those patients with visceral metastases or in very poor general condition being rejected. Radiosensitive tumours (those of the type of basal cell carcinoma) may be submitted to either x or γ radiation, but radio-resistant types (squamous-cell carcinoma or adenocarcinoma) are better treated with radium.

I am indebted to Mr. W. Skyrme Rees for permission to publish this case, and to Dr. W. Whitelaw for the pathological report.

KEITH D. ROBERTS, F.R.C.S.

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The National Association for the Prevention of Tuberculosis has recently published three pamphlets on tuberculosis in the Commonwealth. *A New Colonial Vista*, an eight-page brochure, deals with the problem in general terms and refers to the work of the voluntary Colonial anti-tuberculosis associations. *NAPT Commonwealth Scholarships* (8 pp.) describes the association's scholarship scheme which enables doctors, nurses, and health officers to study the latest methods of control in Britain. *Tuberculosis, a Commonwealth Problem* (48 pp.), is a useful résumé of the papers on the subject read at the third Commonwealth Health and Tuberculosis Conference, held in London on July 8-14, 1952. These publications may be obtained from the National Association for the Prevention of Tuberculosis, Tavistock House, Tavistock Square, London, W.C.1.

Reviews

THE R.A.M.C. AT WAR

The Army Medical Services: Administration. Volume I. Medical History of the Second World War. By F. A. E. Crew, F.R.S. (Pp. 530. £2 10s.) London: H.M. Stationery Office. 1953.

To give the background to Army medical administration Professor Crew has very rightly delved into history, and in this eminently readable story he presents one of the best pictures of the development of the R.A.M.C. that is to be found.

A complete review of this large volume of 530 pages is impossible in the space available, but among the many highlights one or two stand out, and lessons are there to be learnt if the will to learn from and profit by experience exists in this materialistic world to-day. Students of the fortunes of the senior partner of the three corps which form the medical services will find much of interest. It may surprise them to learn that the arguments for and against the D.G.A.M.S. being a full member of the Army Council are no new thing. In 1904, when a complete reorganization of the structure of the War Office took place, the Army Medical Department ceased to hold its honourable niche in the Army hierarchy and became subordinate to the Adjutant-General's department. Since that time repeated efforts, so far unsuccessful, have been made to restore the *status quo ante*. Many consider that a reorganization, now proved by two world wars, is a real necessity if the universal impact of medicine on the life of the soldier is to be placed in its proper perspective. The story demonstrates that adequate provision of medical manpower has a most marked effect on the potential fighting strength of an army. No doctors, no army, is almost axiomatic. Those now deliberating on the means to preserve the very existence of the R.A.M.C. would do well to ponder before they permit the Corps to sink below the state of even financial restoratives.

War greatly increases the size and complexity of problems which receive but scant attention in peace. Not the least of them is an adequate yet accurate assessment of the physical standards of the civil population called up for service with the armed Forces. The problems of medical classification of both officer and man are presented here in a most interesting manner, culminating in the birth of the Pulheems system but stopping short of the stage where this method of classification was universally adopted for the Army. May we hope that in these times of comparative peace the many advantages of this system can be perfected so that every peg, whether round or square, finds its appropriate lodging-place.

The anonymity of the principal actors in this drama of war is maintained to a greater or lesser degree throughout the book, but surely it is only fair that the D.G.A.M.S., who bore the greater part of the responsibility, should receive open praise and recognition, if for no other reason than the inimitable way in which he kept the peace among and controlled the persistent and insistent demands of the consultants in some twenty specialties. That he did so so successfully—and those consultants are the first to admit that he did—stamps him as a man of outstanding capabilities. His continuous "war" with the powers that be is also well told. The Medical Services were fortunate, indeed, in having a man of his attainments at their head during these anxious years.

In the 1914-18 war the Medical Services strove to ensure that they were given ambulance cars for their exclusive use to transport their wounded, and they won the battle on its merits. We read in this history a vivid story of a similar contest in an air-minded decade for the recognition of the essential facts that casualties must have the advantage of air transport and that air ambulances must be provided for the

exclusive use of the Medical Services. This battle still goes on. May the Air Council read, mark, learn, and inwardly digest this chapter and so realize that the needs of the sick and wounded are of almost equal importance to operational demands in a well-balanced fighting force.

The history is concerned almost entirely with the R.A.M.C. One short chapter on dental manpower is included, but the nursing service, though forming a most important partner in the tripartite service, receives scanty attention. The choice of author was an inspiration. The standard of the presentation of his facts is high, and, as might be expected from one of his reputation, the phrasing is well-nigh perfect.

J. C. DOWSE.

YOUNG CHILDREN

The Normal Child: Some Problems of the First Three Years and Their Treatment. By Professor Ronald S. Illingworth, M.D., F.R.C.P., D.P.H., D.C.H. (Pp. 342; 64 illustrations. £1 10s.) London: J. and A. Churchill. 1953.

Some years ago the view was expressed in the Goodenough Report that the teaching of paediatrics should "run like a golden thread" throughout the medical curriculum. It can hardly be said that this Utopian ideal has yet been realized, and Professor Illingworth starts with the assumption that the English medical student knows far too little about normal infancy and childhood when he comes to study or treat disease in these age periods. There are clearly various ways in which this deficiency may be made good. Before reaching the clinical years the student may be taught to integrate the physiology of the human infant with that of the mature adult. The special problems of the childhood community may receive particular attention in the teaching of social medicine. Finally a clinical study may be made of the infant and child in health, observing the widening scatter of developmental phases and behaviour which occur with advancing age.

While an understanding of individual variation in infancy and childhood is most necessary to the practitioner advising parents, it is one which is seldom provided for the medical student within the confines of an overcrowded curriculum, no doubt partly owing to the difficulty of making it even tolerably interesting to those who are in the first flush of studying disease. Professor Illingworth is writing primarily for the doctor who finds himself ill-equipped to decide what is normal and what is abnormal, when to offer reassurance, and when to feel concern. The sub-title of this book gives a better idea of its scope than does the title, since he is concerned with the infant up to 3 years of age rather than with the older child, and to a large extent with those "problems" of feeding, behaviour, and development which he himself regards as within the range of normality. Since, however, there is often no clear landmark in that twilight region where a normal universe overlaps with an abnormal, his definitions will be respected as the considered opinion of an experienced clinician rather than as absolute standards.

The book contains much valuable advice, which, although the author has provided abundant references, is clearly based to a large extent on personal experience. Against this experience the observations of other writers have been checked. As is perhaps inevitable in a volume of this compass and purpose, there is a tendency to over-simplification and dogmatism which will not altogether satisfy the more inquiring reader but will prove a comfort to those requiring immediate practical guidance. The influence of Dr. Gesell, with whom the author studied, is clearly seen and fully acknowledged. Although this book should not be regarded as a comprehensive study of the normal infant (since detailed studies of physiology, biochemistry, nutrition, and embryology have been deliberately omitted), it is a valuable addition to the English paediatric literature and should appeal to those concerned with the upbringing and health of infants and young children.

R. W. B. ELLIS.

A NEUROSURGEON'S LIFE

Brain Surgeon: The Autobiography of William Sharpe. With foreword by Sir Cecil Wakeley, Bt., President of the Royal College of Surgeons of England. (Pp. 244. 16s.) London: Victor Gollancz. 1953.

Every autobiography necessarily gives a one-sided view of its subject. It would be interesting and instructive if to every such account there were appended a short impartial character sketch of the subject by someone who knew him well.

This reflection comes to mind on perusing this readable book by Dr. William Sharpe, an American neurosurgeon. The story of his life is interesting, and there are few inhibitions in the telling of it, but there are so many other details we should have liked to know. Dr. Sharpe's father was a rigidly orthodox pastor of the Scottish Presbyterian Church who worked all his active life on a very small salary amid the slums of Philadelphia, and was loyally supported by his wife. The three sons had to go to church five times each Sunday, and perhaps it is no wonder that this overdose in youth caused a reaction after they left home. All of them became doctors.

William Sharpe went to Harvard and never had any financial difficulty, for he was a born teacher and earned a very good living by coaching his fellow students. After qualification he studied in Germany, visited Russia and Italy, and returned to America to work for a time under Harvey Cushing, who inspired him to devote his attention to neurosurgery. For a year he worked at the Harvard medical centre at Shanghai, and had the distinction of operating successfully on a son of the President of China. Back in America he had a successful career as a neurosurgeon, taking a special interest in the prevention and early treatment of cerebral spastic paralysis. His enthusiasm for this subject was one of the main reasons for writing this book.

Not everyone will appreciate the sardonic sense of humour betrayed in the incident connected with the necropsy on the author's brother, and it is likely that Presbyterians may heave a sigh when they read of the manner in which the widow of such an orthodox pastor spent her last years. Nevertheless the book holds the interest of the reader to the end.

ZACHARY COPE.

THE RIDDLE OF EXISTENCE

Sinn und Gehalt der Sexuellen Perversionen. By Dr. M. Boss. Second edition. (Pp. 136. 17.50 Swiss francs.) Bern and Stuttgart: Hans Huber. 1953.

It is perhaps regrettable that the younger generation, completely under the spell of analytic-dynamic psychology, has lost sight of the many other approaches to psychopathology. In this book the well-known Swiss author examines the "sense and content of the sexual perversions." He calls his book an "existential-analytical contribution to the phenomenon of love." The existential-analytical school of thought, prevalent chiefly in the German-speaking countries of the Continent, regards the problem of human existence as fundamental. Based on Jaspers', Heidegger's, and L. Binswanger's works and linked with the philosophical movement towards existentialism, it brought a revival of some neglected features of the humanist tradition to psychopathology. It does not debunk or flatter human nature, but recognizes human existence as ever resisting being shackled by any system. The English reader will find a good introduction to this school in R. D. Loewenberg's paper "Jaspers on Psychotherapy" (*Amer. J. Psychother.*, 1951, 5, 502).

In the first part of his book the author examines the two theories which have been put forward to explain fully the immense variety of sexual perversions—namely, Freud's psycho-analysis and the anthropological school of Gelbsattel, Strauss, Kunz, and others. While he appreciates and uses psycho-analytic techniques, he criticizes certain Freudian theories as being "hasty identification based on super-

ficial similarities." He attacks Freud's biological-physical approach and states that the libido theory, and especially the Oedipus and castration complexes, do not go to the heart of the real problem of human love, and that therefore the riddle of human existence escapes Freud. The author rejects as well the anthropological theories pertaining to love and sex. Here he finds unproved and unacceptable the assumption that destructive and aggressive impulses account for perversions.

The second part contains eight case histories of a fetishist, a coprophiliac, a kleptomaniac, an exhibitionist, a sadomasochist, and three homosexuals. These case histories are excellently written, and show the author's great power of insight. In all of them he shows how the capacity of "being in the world lovingly" (*liebend in der Welt sein*)—a basic feature of human existence—becomes partly disturbed or totally lost. All perversions mean but frantic attempts to express love in spite of all limitations of this capacity. Here he meets Freud, who said once: "The omnipotence of love is perhaps never more strongly proved than in its aberrations."

In spite of some objections which the reader may raise against a rather nebulous terminology, the book is well worth studying as a challenge to our own basic assumptions and a stimulus to reviewing our own work.

T. A. WERNER.

ASSORTED MONOGRAPHS

Monographs in Medicine, Series 1. Editor: Professor W. B. Bean, M.D., Associate editors: M. Hamburger, M.D., J. A. Leutscher, jun., M.D., and Professor S. Wolf, M.D. (Pp. 655; 21 plates, 21 line drawings. 91s. 6d.) Baillière, Tindall and Cox. 1953.

This books adds another to the annual collections of lectures or monographs on medicine. This field, in which that admirable quarterly *Medicine* reigned in unique splendour for a generation, has now been invaded by a number of competitors. Presumably the public for such books has been increased by the upgrading of hospitals throughout the western world and the increasing numbers of people who are interested in medicine as a specialty. Professor Bean, the editor of the present volume, thinks that "medical progress is not delayed by taking time out to survey the scene from the medium hills, neither staying on the flats of day-by-day affairs, nor climbing the high mountain for the grand and inclusive spectacle." He and his team have provided fifteen monographs averaging about 40 pages each. They vary from such subjects as "Talking with the Patient," which has eight references, to "The Seasonal, Arthropod-borne, Virus Encephalitides," which has 146; "Sickle-Cell Anaemia" has 481 references.

Most of these monographs are admirably written, but they are hard reading, just because of the anxiety to mention all recent work. It is high time an enterprising psychologist discovered how much of importance is remembered per hour spent in reading medical literature of different kinds. If the weekly and monthly journals correspond with the newspaper, then these annual volumes correspond with the magazine, which is possibly not the best instrument of education. A friend said of a bachelor colleague, "He goes home and reads all night, but he remembers little of what he has read because he has not got a special interest to which to attach it." One cannot help feeling that an annual volume of this kind encourages disconnected reading, which is not well remembered.

L. J. WITTS.

The last complete revision of Lewis's Library Catalogue, which covered books up to the end of 1949, was noted in the *Journal* (June 16, 1951, p. 1370). A supplement listing books added to the library during the years 1950-2 has now been published, bringing this useful reference book closer to the present. Over 6,000 new books or new editions are given under both author and subject entries. The supplement may be obtained from H. K. Lewis and Co. Ltd., 136, Gower Street, London, W.C.1, price 6s. (3s. to subscribers to the library).

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GENETICS AND CLINICAL RESEARCH

Human genetics was once said to be a harmless occupation pursued by doctors who knew no genetics or by geneticists who knew no medicine. While the taunt was never altogether justified, some writings by medical men and geneticists have lent it a certain sting. For the different parties are usually interested in different things. The pure geneticist is concerned with such matters as the mapping of human chromosomes, and he studies serological characters or diseases with good Mendelian ratios; and these diseases rarely come the way of the general physician. But formal genetics is only part of a much wider field, and, since the techniques of the laboratory worker cannot be transferred directly to clinical research, other methods have had to be devised. Among these is the study of twins. It has certain limitations, perhaps the chief being the rarity of twins. In studying such a common disease as acute rheumatism, for example, a very large population has to be surveyed, for under 1% of the patients are likely to be one of a pair of twins, and of these about a quarter will be monozygotic and the remainder dizygotic. Though it is desirable to carry out more systematic studies of twins, there is plenty of scope for other and less complex investigations. It is important to know, for instance, whether a disease appears more frequently in certain families than in others. Some recent work illustrates the kind of methods that may be used in clinical medicine to study such a problem.

The pathogenesis of atherosclerosis is debatable, but few would deny that sometimes a disturbed lipid metabolism is of importance.¹ It has long been known that families in which xanthomatosis occurs also show a high incidence of coronary disease, and this has led Adlersberg and his colleagues to a genetic study of coronary disease in general. Adlersberg, Parets, and Boas² made a study of families with

xanthomatosis and of a certain number of patients who did not come from such families but who had contracted coronary disease before the age of 50. In a later study Adlersberg and Boas³ studied the families of patients who had suffered from coronary disease after the age of 60. In all these the serum cholesterol of patients was compared with that of such close relatives as were available.

The genetical deductions made from the first of these studies are faulty in various ways. The writers maintain that "hypercholesterolaemia" is determined by a partially dominant gene which gives rise to xanthomatosis when homozygous. There is no evidence to support this. If it were so, one would expect a high incidence of cousin marriages among the parents of such families, which the authors state is not the case. Discussing the families of the patients with coronary disease before the age of 50, these writers also claim that hypercholesterolaemia shows Mendelian segregation to give a close approximation to a 1:1 ratio. This again is unjustified. They classify a person as hypercholesterolaemic if the serum cholesterol is over 300 mg. per 100 ml. as estimated by Bloor's method. But this is arbitrary. While it is convenient for general clinical use to have some upper limit of normal, it should not be used as a method of classification in genetical work unless it can be shown that people fall sharply into two groups, say one in which the value is never over 200 mg. per 100 ml. and another in which it is never less than 300 mg. In the later study of Boas and Adlersberg the data are of more use; a graph shows the distribution of the serum cholesterol in patients and their sibs, the values ranging from about 150 mg. to over 400 mg. per 100 ml. Both groups show much the same type of distribution, with the mode (that is, the most frequent class) being between 250 and 280 mg. per 100 ml. Analysis of such data is admittedly difficult, partly because age must be allowed for. The population studied consisted largely of Jewish people. It is possible (as the authors seem to believe) that a gene favouring a high serum cholesterol is common in this community, but it has not been demonstrated. It is necessary to know the frequency distribution of the serum cholesterol for this particular population before one can be sure that high values do show an undue concentration in certain families. Even if it is finally demonstrated that there is a significantly high correlation between sibs, there remains the question of interpretation. The investigator must bear in mind that families and larger communities often share dietary habits as well as genes.

Cancer has been extensively studied genetically both in the laboratory and clinically, and some of

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the clinical studies are indeed open to the criticism that they show little knowledge of genetics. If there is one generalization about malignancy that is acceptable it is that "cancer" is not a single disease. This is shown nowhere better than in cancer of the uterus. Cancer of the cervix is associated with a high fertility and a low standard of living, while precisely the reverse is true for growths of the fundus. Murphy⁴ has conducted an investigation in America of the families of patients with carcinoma of the cervix, while Brøbeck⁵ in Denmark has done similar studies on cancer of both cervix and fundus. Murphy compared the families of patients with a control group; Brøbeck used both a control group and the statistics of the Danish Cancer Registry. The proper selection of a control group is a thorny problem, and it is desirable wherever possible to have other confirmatory evidence as well. For this reason Brøbeck's results are the more convincing. Both were handicapped by the fact that death certificates often failed to state which part of the uterus was primarily affected. The results of the two workers differ somewhat, but not to a degree that amounts to contradiction. It would appear that there is a slight but definite tendency for cancer of the uterus to be more frequent in the female relatives of patients with carcinoma of the cervix; Murphy found this to be most striking in the case of mothers and aunts, while Brøbeck found it in the case of sisters. Another interesting finding by the latter author was that an unusually high proportion of the fathers of his patients had carcinoma of the oesophagus. Growths at both these sites show the same social distribution, and it is quite likely that the results are due to some environmental factor common to the families affected.

As to carcinoma of the corpus uteri, Brøbeck found a significant increase in cancer of various sites in the families of these patients. He is inclined to invoke the existence of a general cancer gene to explain this. A similar conclusion was reached in Denmark by Jacobsen⁶ when studying cancer of the breast. There are reasons for treating this with some reserve. Penrose, Mackenzie, and Karn,⁷ working in Britain, confirmed Jacobsen's finding—and that of most workers in this field—that cancer of the breast does show a significant concentration in certain families, but they did not find any significant increase in other forms of malignant disease. We are faced with a direct contradiction in which it is not possible to point to any obvious fault on either side, and here twin studies may prove to be of great value. Once again Danish workers are to the fore. Busk, Clemmesen, and Nielson⁸ have surveyed over 30,000 cancer patients and obtained 184 useful twin pairs. We shall have

to wait many years before a final judgment can be made, since many of the pairs have been observed for only a short time, but as things stand now their evidence is against some general cancer gene being common in Denmark.

The work of such investigations as these may give the impression that only a large organization can obtain valuable results in human genetics. Often this is true, but by no means always. Nor is it true that an intimate knowledge of statistics is required. McFeeters,⁹ one of those doctors who has found in general practice the opportunity to do some research, published a most interesting survey of the distribution of certain pathological conditions in an isolated rural community. This sort of work is of great potential value. In obtaining the results sound clinical sense and skill in handling people are the prime assets; some knowledge of genetics is needed, but advice can always be obtained. The results have to be assessed statistically, but the final biological assessment is another matter. The worker should beware of fitting results to some Mendelian scheme without due thought. The discovery of some non-genetic factor common to certain family groups may be of much greater value than the announcement of a new gene.

SHORTAGE OF HOSPITAL RESIDENTS

Many hospitals, particularly in areas remote from the teaching centres, are complaining of the difficulty of obtaining applicants for the posts of house-officer, senior house-officer, and registrar. In Parliament the other day the Minister of Health said that he was considering how this problem could be solved. It will not be an easy task. The number of recognized pre-registration house appointments is larger than the six-monthly output of qualified men from all the medical schools, yet many hospital management committees have protested that their allowance of pre-registration posts is far below their requirements. In the United States also there are more internships than young doctors to fill the posts, and a number of official bodies, including the Council on Medical Education and Hospitals of the American Medical Association, have set up a National Intern Matching Program, Inc. This bureau receives information from students about the several internships they have applied for and from the hospitals about students whose applications they would like to accept, transfers the details to punched cards, and uses machines to do the actual matching between students and hospitals. The arrangements made by the machines are said to work satisfactorily.

¹ Firstbrook, J. B., *British Medical Journal*, 1951, 2, 133.

² *J. Amer. med. Ass.*, 1949, 141, 246.

³ *Arch. Intern. Med.*, 1952, 90, 347.

⁴ *Heredity in Uterine Cancer*. Harvard University Press, 1952.

⁵ *Heredity in Cancer Uteri*. Copenhagen: Aarhus University Press, 1949.

⁶ *Heredity in Breast Cancer*. London: H. K. Lewis, 1946.

⁷ *Brit. J. Cancer*, 1948, 2, 168.

⁸ *Ibid.*, 1948, 2, 156.

⁹ *British Medical Journal*, 1939, 1, 218.

In attempting to give the best possible service hospital authorities should bear in mind the benefits likely to accrue to the patient if history-taking and the preliminary examinations are carried out by a senior member of the staff. Therefore the shortage of house-officers would not be an unmixed evil if compensated by more generous staffing at the consultant, senior hospital medical officer, and senior registrar levels. Despite the great expansion of hospital specialist staff since 1948 there is still need for increase in the number of consultants and, in the appropriate specialties, senior hospital medical officers.

Some hospitals have tried to get over their difficulties by arranging for general practitioners, on a rota system of duty, to take on the work which normally falls to house-officers and registrars. Such schemes are of only limited value. General practitioners can be given a much wider field of hospital work as clinical assistants, with duties more akin to those of senior registrars, in association with the consultant staff. It need not be more than a step from this to the employment in hospitals on a sessional basis of suitably qualified general practitioners in the specialty of their choice. There would be more encouragement for ex-senior registrars to go into general practice if the prospects of obtaining sessional work in hospitals were brighter than they are now.

In the past two years the hospital service has been discredited as a bountiful source of consultant posts for existing senior registrars and for new entrants to the registrar group. If doctors of senior house-officer and registrar status are to be recruited and retained in greater numbers they must have reason to feel that they are improving their personal fitness for general practice and their prospects of obtaining an opening in general practice. They must also feel that while working in hospital they are not being exploited as cheap labour. An additional year or two in well-chosen resident hospital appointments, with perhaps an M.D. degree acquired in that time, ought to be a strong recommendation on behalf of an applicant for an assistantship with view to partnership in general practice. It is doubtful whether it works that way at present. In the interests of general practice, at least as much as in the interests of the hospital service, this doubt should be removed from the minds of young doctors.

The hospital service must face the fact that the present rates of pay for senior house-officers and registrars are not high enough to attract and retain

for three years or so doctors whose ultimate aim is general practice. The young doctors who should be applying for these hospital posts will have spent a year in pre-registration house jobs and then two years in the Services in addition to their six-year medical course. Besides, the duties of experienced hospital residents are arduous and carry what seems to be an increasing risk of legal actions—a point emphasized by Mr. W. Gissane¹ in a recent letter. A possible improvement which the hospitals should consider is the provision of flats or small houses for young married doctors. Those management committees whose advertisements carry the promise of such accommodation are seldom short of suitable applicants. The suggestion has been made that a new grade of senior house-officer might be established for those waiting to enter general practice. The salary would be the same as that of an assistant, and of course suitable living accommodation for married men would have to be provided. With such an arrangement as this some young doctors might be prepared to extend their period of hospital work by two or three years. Incidentally, the holders of these posts would avoid the stigma of "failed specialist" which tends to be attached to registrars and senior registrars when they attempt to transfer to general practice. A more drastic change has recently been proposed by Mr. N. J. Logie,² who suggests that a joint hospital and general-practice appointment might replace both the trainee assistant scheme and first-year registrar posts. But probably the quickest way to obtain an increase in senior house-officers would be for the armed Services to permit deferment of call-up for a year after the pre-registration year. This might cause embarrassment to the Forces for a time, but once that period was over they would obtain just as many, and more experienced, doctors, some holding higher qualifications.

NEONATAL ASPHYXIA

There are many reasons why a baby may be reluctant to breathe adequately at birth. They include central depression caused by intrauterine anoxia, narcotic drugs, raised intracranial pressure, or prematurity, and it is more appropriate to consider the morbid condition present than to hope for any universal remedy. A wider appreciation of this has led to the abandonment of older methods of stimulation which were little better than punitive, and traditional types of artificial respiration are now regarded as ineffectual and often mischievous.

The baby cannot oxygenate its vital centres and therefore remain alive unless its airway is clear and its blood circulation and respiratory movements are adequate. The first essential is therefore to remove foreign material

by suction from mouth, nostrils, and pharynx at the earliest possible moment, and preferably before the first inspiratory gasp has sucked it out of reach. Bronchoscopy in these circumstances may be too late to be effective, since the source of the child's continuing atelectasis may already lie too deep for removal by mechanical means. The aspiration of regurgitated stomach contents is particularly apt to occur in premature babies and after caesarean section.¹ In these cases there should be no hesitation in passing a fine rubber catheter down the oesophagus and emptying the stomach by suction. The vigorous baby with an active cough reflex is well able to protect itself from this risk, but prematurity, narcosis, foetal shock, or serious asphyxia may diminish coughing and add peril to respiratory efforts already handicapped.

The shocked baby is toneless and breathes with intermittent gasps. Tracheal intubation is particularly beneficial here, and it is facilitated by the flaccid state of the baby. It ensures an effective airway, and the trachea can be aspirated and oxygen supplied at intermittent positive pressure of 25 cm. of water.² The purpose of this is not so much to blast open the collapsed alveoli as to flood the bronchial tree with oxygen, which is then available during the smallest inspiratory effort. Foetal shock (or white asphyxia, to give it the older and less adequate name) demands gentle handling, so that the baby is disturbed as little as possible and heat loss is kept to a minimum. Such cases are often injudiciously overtreated. Oxygen is the first need in asphyxia; of carbon dioxide there is already more than enough. But no atmosphere will count for much if the baby is incapable of breathing it. In the absence of vigorous respiration the oxygen deficit can be partially made good by absorption from the gastro-intestinal tract,³ and the supply of a very gentle trickle of oxygen through a fine polythene tube passed into the stomach often helps to tide a baby over the immediate crisis of asphyxia. The use of Eve's rocking method⁴ of artificial respiration or a mechanical rocker of the Roberts-Talley type⁵ disturbs the child very little and encourages circulation by increasing venous return to the heart.

Where narcosis is to blame—for example, from morphine recently given to the mother in labour—the effects can to some extent be countered by the intravenous use of N-allyl normorphine. Nikethamide, too, will often rouse a narcotized infant to respiratory activity, but it may do more harm than good when shock is present.

Bloxson's positive pressure oxygen-air lock⁶ is now popular in the United States. In it the whole baby is subjected to alternating positive pressure ranging every forty seconds or so between 1 and 3 lb. per square inch (0.07–0.21 kg. per sq. cm.) in the belief that these conditions reproduce the pressures of the second stage of labour, that a continuation of these circumstances is desirable, that bronchial drainage is improved, and that

oxygen absorption is increased, to mention a few claims. But these arguments have not been wholly supported by analysis,⁷ though the child in such an apparatus is at least safe from meddlesome interference and is left at peace to enjoy warmth and an atmosphere rich in oxygen. The phrenic-nerve stimulator, introduced by Cross⁸ is a more active line of treatment, and operates by supplying an electrical stimulus over the point of stimulation of the phrenic nerve in the neck. Further reports of its usefulness are awaited.

When atelectasis persists, especially in premature infants, the condition of the child, though initially fairly good, is liable to deteriorate in the course of several hours, and hyaline membrane, intraventricular haemorrhage, or a combination of both take their toll. Hyaline membrane is now becoming increasingly recognized in association with neonatal atelectasis. It consists of acidophile material which, on microscopy, is found plastered round the walls of the alveolar ducts, causing secondary resorption with non-aeration. Its origin is still disputed, and death from asphyxia and atelectasis usually occurs within the first three days of life. Various types of respirator to work in cycles determined by the baby's own irregular respiration are being developed by Donald⁹ in order to help in expanding atelectatic lung by augmenting spontaneous respiratory effort, but further development and simplification in practical handling are required.

There is no surer guarantee of healthy respiration in the newborn than full-time normal delivery, and the science of obstetrics has still far to go in meeting the hazards that delivery and premature labour hold for the foetus. Here lies a rich field in prophylaxis. The emergency of neonatal asphyxia is all too common, but research into its prevention and treatment is gathering momentum. In the meantime treatment must still rely mainly on rest, warmth, oxygen, and a clear airway in the comforting knowledge that a baby that has a chance to breathe will usually take it.

SURGERY FOR CORONARY DISEASE

Surgery to-day plays a limited part in the treatment of coronary artery disease. Two principles are invoked. First, as a palliative procedure the afferent visceral nerves carrying impulses from the heart may be destroyed to relieve the pain of angina. This is most surely done by bilateral excision of the upper four thoracic sympathetic ganglia. Although pain is then absent, some sensation as of tightness or choking is still felt on exertion, so that the warning signal is not entirely lost. Secondly, an attempt may be made to increase the blood supply of the myocardium to prevent ischaemia. Coronary arteriosclerosis is often far advanced when arteries elsewhere are scarcely affected. Such patients should be ideal subjects for surgical revascularization. Unfortunately a reliable method has not yet been established, so few patients have been treated by operation. Much experimental work has been carried out, mostly by operations on dogs, who can be protected from the effects of ligature of a

¹British Medical Journal, 1953, 1, 1167.

²British Medical Journal Supplement, 1953, 1, 247.

¹Gellis, S. S., et al. *New Engl. J. Med.*, 1949, 240, 533.

²Gibberd, G. F., and Blaikley, J. B., *Lancet*, 1935, 2, 138.

³Ylpo, A., *Act. paediat. (Uppsala)*, 1935, 17, Suppl. 1, 122.

⁴Eve, F. C., and Forsyth, N. C., *British Medical Journal*, 1948, 11, 554.

⁵Roberts, Hilda, *J. Obstet. Gynaec. Brit. Emp.*, 1949, 56, 961.

⁶J. Pediatr., 1950, 37, 311.

⁷Apgar, Virginia, and Kreiselman, Joseph, *Amer. J. Obstet. Gynec.*, 1953, 66, 45.

⁸British Medical Journal, 1951, 1, 1043.

⁹*Lancet*, 1953, 1, 9.

coronary artery by various preliminary manoeuvres. Since the initial work of O'Shaughnessy¹ in Britain, who showed that suture of the omentum to the surface of the heart was an effective method, most reports have come from the U.S.A. The simplest of the techniques attempted is the injection of an irritant substance into the pericardial sac to promote vascular adhesions between the parietal layer and the surface of the heart. Beck,² whose experience is the widest, recommended finely powdered asbestos. This method can be combined with other manoeuvres. Various organs and tissues have been applied to the epicardium, such as lung or muscle; vascular communications can be demonstrated, but their value is equivocal. Attempts have been made at the direct anastomosis of an artery, such as the internal mammary, to one of the coronary arteries; technical difficulties are great. Success has been reported after implantation of this vessel into the myocardium. Ligature of the great cardiac vein was advised by Fauteux.³ And Professor Charles Rob, in an article at p. 308 of this *Journal*, discusses the possibility of restoring the blood flow by means of grafting in new blood vessels.

A new approach has recently been reported by Bailey and others,⁴ who were continuing work initiated by Beck. Arterial blood is supplied through the coronary sinus. The capillaries of the myocardium of the left ventricle are conceived as in communication with the branches of three sets of vessels—the coronary arteries, the coronary sinus system, and the deep myocardial veins, the latter normally draining 40% of the deoxygenated blood. The coronary sinus tributaries are considerably more numerous than those of the coronary artery. The coronary sinus system communicates with veins of the other chambers of the heart, and with veins opening into the right atrium—these collaterals forming a safety-valve mechanism after arterialization, while the blood which has passed through the capillaries can drain by the deep myocardial veins system. Arterial blood is supplied to the coronary sinus by a free vein graft the other end of which is anastomosed to the aorta. After an interval, the atrial end of the sinus is narrowed by partial ligation. When this procedure has been successfully carried out in dogs, the blood flow from the distal end of a divided coronary artery, measured directly, is greatly increased compared with a normal dog; this increase is reduced by clamping the graft. Bailey and his colleagues report the results of this operation in eighteen human patients; two died, and in seven the graft remained patent. These were all improved.

It is difficult to assess results of treatment of coronary disease, first because its natural course is extremely variable, and secondly because, except for subsequent myocardial infarcts, assessment must be founded on subjective evidence. These provisos must be remembered in evaluating any procedure. A sound basis can be established only by the observation of large numbers of patients for long periods, and so far there have been no opportunities.

¹ *Lancet*, 1937, 1, 185.

² *Amer. Heart J.*, 1941, 22, 539.

³ *Ibid.*, 1946, 31, 260.

⁴ *J. thorac. Surg.*, 1953, 25, 143.

SUN ON THE SKIN

Sensitivity of the skin to light is so common that sunburn is accepted as almost normal by people taking holidays in the middle of the summer, even in the United Kingdom. For most people the full summer sun is necessary to cause sunburn, but people with an abnormal hypersensitivity to light may suffer symptoms from about May onwards in this country. The skin of normal people is damaged only by the invisible rays of wavelength below about 3170 Å, and in natural sunlight the ultra-violet band around 2900 to 3170 Å is the part of the spectrum responsible. Shorter wavelengths produced by the mercury vapour lamp also damage the skin, but are not to be found in natural sunlight. Light in the visible range and in the infra-red may give rise to skin reactions, but not in normal people.

The type of response in the skin varies a good deal. The familiar common sunburn starts as a simple erythema with oedema of the surface, and may proceed to vesiculation. When abnormal sensitivity is present the reaction may be one of simple urticaria or of vesiculation and blister formation. Less often appears the papular excoriated polymorphic light eruption which may be associated with abnormalities of porphyrin metabolism.

The position of xeroderma pigmentosum in the general classification of light sensitivity remains uncertain. Although the eruption is strictly limited to areas exposed to light, sensitivity to ultra-violet cannot be demonstrated by simple testing, and the changes produced are those of chronic light dermatitis without the acute or subacute phase. The peculiar sensitivity of the skin in lupus erythematosus has also never been explained. It is an important feature, accounting for the seasonal variations in that disease and sometimes apparently being responsible for converting the chronic form into the acute disseminated and malignant variety.

It has long been known that porphyria, whether natural or produced experimentally, is likely to be accompanied by sensitivity to light. Porphyrinuria¹ is not constantly present, and an examination of the stools is sometimes necessary in order to demonstrate abnormalities in porphyrin metabolism. Certain drugs may increase sensitivity to light, the most common being the sulphonamides. A few years ago, when sulphonamide contact dermatitis was more common, light sensitivity was often found too. The skin usually returns to normal as the dermatitis clears up, but occasionally light sensitivity has persisted for many years after all signs of sulphonamide dermatitis have disappeared. The reason for this is obscure.

Far more common in ordinary practice is the development of light sensitivity from local applications to the skin. The term "phyto-photo-dermatitis" introduced by Klaber² covers all those states in which sensitivity

¹ MacGregor, A. G., Nicholas, R. E. H., and Rimington, C., *Arch. Intern. Med.*, 1952, 80, 483.

² *Brit. J. Derm.*, 1942, 54, 193.

³ *Arch. Pediat.*, 1935, 52, 833.

⁴ Russell, B., and Anderson, D., *Lancet*, 1950, 2, 347.

⁵ *Arch. Derm. Syph. (Chicago)*, 1953, 87, 284.

⁶ *Lancet*, 1952, 1, 945.

THE SWEET TOOTH

The belief is widespread that an excessive consumption of readily fermentable carbohydrates, particularly in the form of sweets, is an important cause of dental caries. Yet in several of the investigations made in the past no increase in caries rates has been recorded when additional sweets have been given to children living in institutions. In an attempt to evaluate the part played by fermentable carbohydrates in dental caries, the Swedish Government and the Swedish Dental Institute organized a long-term investigation at Vipeholm Hospital, Lund, in 1945. This hospital houses about 1,000 patients suffering from mental deficiency or other ailments. Reports on some of these studies, with thorough statistical analyses, have now been published.^{1,2} Sugar was added to the basic diet of different groups of patients in the following ways: (1) dissolved in beverages and semi-fluid foods, (2) baked in bread, (3) plain chocolate, (4) 8-9 toffees daily, (5) 24 toffees daily, (6) 22 pieces of caramel daily. In groups 3, 4, 5, and 6 the supplements were given between meals. In a control group fats were substituted for the fermentable carbohydrates to compensate for loss in calories. The highest caries experience occurred in the group taking 24 toffees daily; these patients showed an average of 4.02 new carious tooth surfaces per person per year. The controls showed the lowest increase, with 0.30 carious surfaces. The caries experience of the beverage group did not differ much from the control, and the groups receiving daily 8-9 toffees and 22 pieces of caramel respectively did not differ notably from the group on 24 toffees. Caries in the chocolate and the bread groups was intermediate, but was considerably less than in the toffee groups.

As another part of this investigation samples of saliva were taken from these patients at 15-minute intervals during the day, and analysed quantitatively for sugar. From a correlation of these findings and the caries experience the following were among the conclusions drawn: first, sugar in the form of sticky sweets consumed between meals causes a marked increase in the number of new carious cavities; secondly, sugar taken with meals is not so deleterious; and, thirdly, chocolate appears to be less apt to produce caries than toffees.

All the same, individuals varied greatly in these tests. Some could consume sweets between meals over long periods without an increase in caries, while others deprived of sweets and consuming little sugar in their food developed many new cavities. It is clear that there must be other factors in the causation of dental caries, but there seems to be good evidence that the frequent eating of sticky sweets between meals is of primary importance as a cause of caries in many people. These studies also showed that thoroughly rinsing the mouth with water, which was then swallowed, immediately after eating sweets or after meals would greatly reduce the concentration of sugar in the mouth. This would seem a practical method of caries control for parents to teach their children when they are not prepared to ban the eating of sweets between meals.

¹ Gustafsson, B., *Sverig. TandläkFörb. Tidn.*, 1953, 45, 51.

² Lundqvist, C., *Odontol. Revy*, 1952, 3, Suppl. 1. (In English.)

of the skin results from contact with plants or from their juices. More than a hundred plants have been named as possessing this quality; some of them, such as the milky juice of the fig, will sensitize regularly most normal subjects on the area of skin to which they are applied. With others there seems to be an element of personal idiosyncrasy or sensitivity. This appears to be the case with Berloque dermatitis. It must surely be fairly common for people who have applied eau de Cologne to the skin to expose that area to sunlight a few hours afterwards; and yet Berloque dermatitis, which results from this sequence of events, is quite uncommon. The same may be said of that form of cheilitis which results from light sensitization of the mucous membrane of the lip by eosin. Under experimental conditions some proprietary face creams can be shown to heighten the sensitivity of the skin to light in most normal subjects. The degree of sensitization thus induced is slight and does not appear to cause trouble. But perhaps the melanosis of the face and neck seen in some women is traceable to such a cause. It has long been suspected that this melanosis was in some way connected with the application of face creams.

It is not easy to increase tolerance to light by systemic treatment. Taking mepacrine by the mouth allows an increase in the dose of ultra-violet light needed to cause erythema, and possibly the beneficial effect of mepacrine in lupus erythematosus is brought about, at least in part, by this mechanism. According to Eder³ the administration of large doses of iron to infants increases their tolerance of natural sunlight and enables the skin to pigment evenly without burning. He attributes this to an increase in the concentration of iron in the tissues. And it is well known that the presence of haemosiderin in the skin will favour melanin pigmentation. This is seen in varicose dermatitis and in haemochromatosis, and arises presumably because the metal attracts sulphhydryl groups and liberates tyrosinase.

It is far easier to protect the skin with local applications. The normal skin may be protected from ultra-violet light with a variety of invisible substances, and 5% of tannic acid in vanishing cream is probably as good as anything.⁴ Para-aminobenzoic acid is also remarkably effective, but may perhaps be more apt to produce epidermal sensitization. In an interesting survey of the whole subject of light sensitivity, Kesten and Slatkin⁵ give the results of examining some light-screening lotions and creams which are on the market. It is encouraging to learn that most of them have a good light-screening effect, at least up to five times the ordinary erythema dose. In abnormal light sensitivity when visible wavelengths must be screened the problem is more difficult, and the best results are probably obtained by opaque applications, which must then be carefully tinted so as not to be conspicuous in use. The cream devised by Smithers and Wood⁶ for use in xeroderma pigmentosum is of this kind, and serves the double function of protecting the skin from light and at the same time concealing much of the disfigurement of the disease.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

CORTISONE AND A.C.T.H.—II

BY

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Both cortisone and A.C.T.H. are scarce, and demand is likely greatly to exceed supply for a number of years. It will not be possible, nor indeed is it desirable, to use the drugs indiscriminately, and one of the main problems confronting the physician therefore will be how to use a limited allocation to the best effect. The diseases for which the drugs have been used with success are many, but some stand out as having a much stronger claim than others; the conditions considered below all deserve high priority. The strongest indication for cortisone or A.C.T.H. therapy is for replacement in conditions where the endogenous adrenal or pituitary hormone is inadequate.

If the adrenals are absent or diseased then A.C.T.H. will have no target organ on which to act and so will prove useless. The most compelling reason for cortisone therapy therefore is after bilateral total adrenalectomy, an operation sometimes employed experimentally for the treatment of certain inoperable neoplasms and for severe hypertension. These cases should be handled only by experts, and the operation should never be carried out unless cortisone is available for maintenance.

Addison's Disease and Hypopituitarism

Both Addison's disease and hypopituitarism are conditions in which the indications for cortisone therapy are strong. Patients with Addison's disease are not always well controlled by salt and D.C.A. Some of them remain in a mildly subnormal state and others suffer from symptoms due to an abnormal tendency to develop hypoglycaemia. Both these states can be much improved by small daily doses of cortisone, 25 mg. orally each day usually being adequate for maintenance. Patients with hypopituitarism, especially those chronic cases due to post-partum necrosis of the anterior pituitary lobe, are greatly benefited by testosterone therapy, but even with such treatment they often continue to suffer from hypoglycaemic symptoms and even coma; in these patients there may also be transient attacks of coma not clearly related to a low blood sugar. Both these symptoms are considerably alleviated by a small daily dose of cortisone; usually 12.5 mg. twice a day is sufficient. In both diseases ability to withstand the stress of operation or infection is much impaired: during fevers, such as influenza or pneumonia, it is desirable to increase the dosage to 100 mg. daily, and before and after major operations a daily dose of 200 mg. is of the greatest value.

In the acute emergency of an Addisonian crisis parenteral and oral cortisone are also of very great value, and ideally all patients with Addison's disease should carry with them an emergency pack of cortisone tablets for use when subjected to unforeseen stress.

In the substitution therapy of hypopituitarism oral cortisone is greatly to be preferred to A.C.T.H., as the frequent injections of the latter are a heavy burden to the patient. In Addison's disease A.C.T.H. is not indicated, since the adrenal glands are only sluggishly responsive, or even completely resistant, to the stimulus of the A.C.T.H.

The extra benefit bestowed by regular cortisone in either of these diseases may be undramatic if hypoglycaemic symptoms are not present. But cortisone is likely to increase efficiency and to enable the patient to carry out his job

more satisfactorily—a very important matter. All established cases should have access to the drug, and theirs should be a priority claim when supplies are restricted.

Rheumatoid Arthritis

So much publicity has been given to the effects of cortisone and A.C.T.H. in rheumatoid arthritis, and so impressive is the prompt response, that popular clamour for the use of the drugs is strong. Most cases of rheumatoid arthritis will respond, though in very varying degree. The main exceptions are advanced cases with severe contractures and with burnt-out inflammation. Pain, joint tenderness, and stiffness diminish early; periarticular swelling and inflammation diminish in more variable degree and more slowly. There is renewed optimism and improved sense of well being and appetite. If any fever has been present, it will be reduced or abolished. The erythrocyte sedimentation rate starts to fall and may return completely to normal. The persistent and resistant anaemia, so frequent in rheumatoid arthritis, is improved. The general mobility and agility of the patient is much increased, the extent of this benefit being largely determined by the state of the disease process in the various joints.

With such great benefit to be expected in a majority of cases it is clear that the case for cortisone is strong. Yet great caution must be observed in exhibiting the drug. The curiosity of physician and patient to see the effect is not alone sufficient reason. Most patients in the chronic stages of rheumatoid arthritis have become fairly well adjusted to their own degree of disability. If now a drug is given which produces a dramatic alleviation of their symptoms, and if later this drug has to be stopped because of shortage of supply, then the patient will be precipitated into a state of acute disappointment and dissatisfaction. To start a patient with established rheumatoid arthritis on a course of A.C.T.H. or cortisone thus imposes a very heavy responsibility on the physician so doing. He must either see his way clear to obtaining steady supplies of the drug for an indefinite period for his patient, or must most carefully warn him that, owing to shortage of supply, whatever effect the drug may have can only be temporary. If such warning is not given, more harm than good is often done by a short course of the drug.

Although supplies are steadily increasing, they are likely to remain far below demand for some years to come. It is desirable, therefore, for physicians to develop a plan of action in relation to the drug. As a general guiding principle it is suggested that highest priority should be given to those sufferers from rheumatoid arthritis who are bread-winners and who can be improved sufficiently to continue remunerative work by cortisone maintenance therapy, but who are unable to work without it. Similarly of high priority are those housewives who can be raised from invalidism to usefulness and who have several children to look after. In both these groups a trial course is justified, but the nature of the trial should be carefully explained to the patient. Each case must be considered on its merits. While supplies remain scarce, the continued use of cortisone cannot readily be justified in those who, even with it, remain bedridden or severely disabled.

In some other circumstances there will be a strong case for the drug. Thus a rapidly progressive and disabling attack of rheumatoid arthritis, if resistant to other measures, is a strong indication for cortisone. Investigation is also

being made into the use of cortisone therapy as a temporary cover during remedial orthopaedic procedures, but no final conclusions on its value have yet been reached.

With A.C.T.H. initial daily dosage should be 80 to 100 mg. divided in four six-hourly doses, or one single injection of 40 mg. of gel. Larger doses may occasionally be needed. When remission is obtained, dosage is gradually lowered to the lowest figure that will maintain useful control of the disease, often 10 to 30 mg. daily.

With cortisone, the daily initial dose should be 200 mg. This may usually be lowered after a few days to 100 mg. Either injections or oral tablets may be used. Here also dosage is reduced to the minimum that will exert effective control. A daily maintenance dose of 75 mg. is an average need.

Acute Rheumatic Fever

The suppressive effect of cortisone or A.C.T.H. on acute rheumatic fever is equally dramatic. Within a day or two temperature will often have fallen to normal and malaise have been abolished. Tender and swollen joints will become practically normal and the general condition of the patient will be greatly improved. The classical manifestations of activity of the rheumatic process are suppressed, often almost completely.

The two major dangers in rheumatic fever are immediate heart failure and permanent valvular and myocardial damage. Heart failure often responds well, the good effect on the myocardium outweighing the less important tendency to increased sodium retention; but traditional methods of treatment such as salt restriction and mercurials should not be omitted. Heart size may diminish and the P-R interval on the electrocardiogram shorten. The action is, however, apparently purely suppressive, and relapse will often occur on stopping therapy, unless in the meantime the disease has burned itself out spontaneously. Greatest interest naturally centres round the possible value of early cortisone or A.C.T.H. therapy in preventing valvular damage. Unfortunately it is not yet possible to state with certainty that such protection is achieved. Nevertheless, acute rheumatic fever patients should get the benefit of the doubt whenever supplies permit. For full effect, treatment should be prompt and in full dosage. The starting dose should be 200 mg. daily of cortisone or 100 mg. of A.C.T.H. (preferably as the gel). After a week or two this dosage may be gradually reduced to a maintenance figure of 100 mg. daily of cortisone or 25 to 40 mg. of A.C.T.H. This will usually need to be continued for four to six weeks or until on further reduction there is no sign of recurrence of activity. Proportionately smaller doses may be given to children. In the more chronic cases of rheumatic fever the results of therapy are much less impressive, as so much damage has already been done.

Disseminated Lupus Erythematosus and Some Other Collagen Diseases

Disseminated lupus erythematosus is one of the so-called collagen diseases and responds well to A.C.T.H. or cortisone therapy. Suppression of activity can usually be achieved, with relief of most of the symptoms. Like acute rheumatic fever, the best results are obtained with early treatment. The main difficulty is that of sufficiently early diagnosis; it is desirable that the characteristic L.E. cells should have been found in blood or bone marrow. Therapy may be expected to abolish the fever, joint symptoms, and skin manifestations more slowly, and to hasten resolution of pleural or pericardial effusions. Renal abnormalities, however, are not affected, and it is generally held that, when renal damage is severe, treatment is less satisfactory. The sedimentation rate falls, but anaemia may persist. Remission of symptoms of sufficient degree to maintain patients ambulant and even at work for very many months may be expected in a high proportion of early cases, but relapse often follows promptly on cessation of therapy. The diagnostic L.E. cells do not disappear on A.C.T.H. or cortisone therapy, and treatment must be continued for

long periods. In late cases the rapid downhill course is not significantly prevented by A.C.T.H. Associated bacterial infection should be treated with antibiotics.

In *periarteritis nodosa* the activity of the lesions can be reduced, but the general course of the disease is not much benefited. Some degree of remission will often occur in early cases, but in more advanced cases with severe cardiac or renal damage no benefit can be expected, and the metabolic changes produced by treatment with A.C.T.H. or cortisone may actually be harmful.

In *scleroderma* the benefit is usually slight. By the time the disease is diagnosed much collagen will usually have been laid down, and this will not be affected by the hormone therapy. In very early cases some remission may occur.

In *temporal arteritis* the pain and tenderness in affected arteries can be reduced, but, if vision has been lost, this is not likely to be restored.

In *dermato-myositis*, also, the main effect is to reduce pain and oedema, a purely symptomatic improvement.

Asthma and Allergic States

Status asthmaticus is an acute emergency. It may completely fail to respond to adrenaline and other adrenergic drugs, and may terminate fatally in two or three days. Viscid plugs of mucus too thick to be coughed out play a big part in the lung failure. In such patients prompt use of A.C.T.H. may have a dramatic, even life-saving, effect. If adrenaline is not producing relief it should not be continued in large doses, but intravenous A.C.T.H. or, as second best, A.C.T.H. injections should be promptly substituted. For the intravenous drip 25 to 40 mg. dissolved in 500 ml. of saline and delivered slowly over several hours will often produce an effective response; with intramuscular injections 25 mg. six-hourly is usually sufficient. Not all will respond, but the treatment should be tried in all serious cases.

In *severe chronic bronchial asthma*, which in this country usually has a big infective factor in its aetiology, effects are more variable and less dramatic. A two-week course of 40 to 60 mg. daily of A.C.T.H. gel may be tried, the dose being reduced gradually for the last few days. If improvement does occur it may persist for several weeks after cessation of therapy.

Allergic Asthma and Allergic States.—In acute attacks of allergic asthma good results may be expected from A.C.T.H. or oral cortisone therapy in a good proportion of cases. It is indeed possible that the benefit in the infective group is largely due to the effect on the allergic factor in these cases. In drug sensitivities and other allergic skin manifestations good results may also result from prompt and full dosage.

Pemphigus

Pemphigus stands out among skin diseases as one with cogent indications for A.C.T.H. or cortisone. Occurring in several forms, it has a high mortality. With intensive therapy with A.C.T.H. or cortisone the distressing skin lesions may be brought under control and indeed healed in the great majority of patients. But it is now realized that large doses are needed to ensure full control. Forty milligrams of A.C.T.H. daily by intravenous drip or 40 to 60 mg. six-hourly intramuscularly are often needed in the early treatment. Of cortisone, 300 to 400 mg. orally may be required daily. When the disease is under control dosage is gradually reduced to low maintenance levels, which must be continued for many months. It is too early to say in what proportion of cases a complete cure can eventually be achieved. Failure to get great improvement is usually a sign of inadequate dosage. With adequate therapy, new lesions should cease to form within four to seven days, though healing of existing lesions may take several weeks. If toxic side-effects develop, a compromise dose may have to be found. Since in most cases of pemphigus therapy may be life-saving, sufferers from it should have high priority for these drugs.

Other Skin Diseases.—Good therapeutic responses have been obtained in dermatitis medicamentosa, particularly that due to penicillin. Generalized exfoliative dermatitis often responds well to A.C.T.H. and cortisone. The drugs should be used when they are likely to be life-saving or to relieve severe but temporary distress. In general they should not be used in chronic or recurrent skin diseases.

Eye Diseases

In such a wide field, only certain general points can be mentioned here. Cortisone or A.C.T.H. therapy produces a prompt subsidence of inflammatory reaction and diminution of fibroblastic activity. Their value, therefore, is to minimize the danger of residual damage from an excessive acute inflammation. The local application of cortisone to the eye is so effective that the use of A.C.T.H. or parenteral cortisone is seldom necessary and indeed may be less effective. Cortisone may be applied directly as drops, the standard preparation being diluted 1:4 for the purpose. It may be instilled every hour until inflammation subsides. Alternatively an ointment of 15 mg. per gramme in lanolin or a similar base may be applied every three hours. Cortisone may also be given by subconjunctival injection, but this is not usually necessary.

Results are often dramatic. In acute iridocyclitis the symptoms and signs may resolve completely in two to three days. In subacute and chronic cases results are much less impressive. In conjunctivitis the acute inflammatory process is readily reduced, but the infecting organism is not affected and the signs of infection will return when therapy is stopped. Other methods of treatment, such as with antibiotics, should therefore not be neglected.

In acute corneal ulceration the prompt exhibition of cortisone may prevent or greatly delay vascularization and infiltration, thus minimizing later scarring. Cortisone tends to delay wound healing, but in most corneal ulcers the benefits tend to outweigh the disadvantage of slower healing.

Cortisone is likely to prove of great value in cases of sympathetic ophthalmia and lead sometimes to the saving of sight. There is considerable uncertainty about the effects of cortisone on tuberculous processes. Cortisone should not generally be used for ocular conditions suspected of being tuberculous unless skilled anti-tuberculous chemotherapy is also available, as the cortisone may light up a relatively quiescent focus.

Since so many ocular conditions can be greatly influenced by local applications, very small amounts of cortisone are required and such cases can usually be given a high priority for the drug.

Ulcerative Colitis

The place of cortisone or A.C.T.H. therapy in this disease is still a matter of exploration and discussion. It is rather less well defined than in many other diseases. There is no doubt that beneficial effects can often be produced in the inflamed colonic mucosa. In a number of cases the mucosa will be seen, on sigmoidoscopy, to have improved greatly, to be less inflamed, and less liable to bleed; it may even return to normal. General remission of other symptoms, with improvement in the condition of the patient, may be expected in a good proportion of cases. Though relapse may not follow immediately after cessation of therapy, it is likely to occur sooner or later, and the relapse may not prove so responsive as the earlier attack; results are rather unpredictable. We have seen one man have a two-year remission after a 10-day course of A.C.T.H., and, in contrast, another who deteriorated so rapidly whilst on A.C.T.H. that he had to have an emergency colectomy, treatment which led to his eventual recovery. A.C.T.H. does not provide a cure; it may prove of value in bringing a relapse under speedier control or in improving the general condition sufficiently to make surgical intervention safer. In troublesome cases it is unlikely to replace surgical treatment.

It is unlikely also that prolonged maintenance therapy will have any important place in the treatment of the

disease. The most hopeful use for the drug is promptly at the commencement of a relapse.

Blood Disorders

The value of A.C.T.H. and cortisone therapy in blood disorders does not seem to be high. In only two conditions are there reasonable chances of improvement. In *acquired haemolytic anaemias*, whether idiopathic or symptomatic, a favourable response may be expected in most cases. Improvement may persist for several months after cessation of therapy, occasionally for more than six months.

In *thrombocytopenic purpura* also, whether toxic or essential, remission may be induced in a high proportion of cases by cortisone or A.C.T.H. therapy, but relapse is more likely to occur promptly when treatment ceases. Occasionally, however, cure seems to be complete. These two disorders present the most favourable conditions for the use of A.C.T.H. and cortisone, but in neither is the prospect of a cure high.

In *acute leukaemia in children* a beneficial response may often be obtained and sometimes almost complete remission. The benefit is purely temporary, and in the long run little is gained in such cases. Parents should therefore be warned not to draw too strong a hope from any initial improvement. No appreciable response is obtained in adult forms of leukaemia, in aplastic or refractory anaemias, in congenital acholuric jaundice, or in paroxysmal nocturnal haemoglobinuria.

Renal Disease

Chronic renal damage with poor renal function is usually regarded as a contraindication to cortisone or A.C.T.H. therapy: in cases of chronic or subacute nephritis the results of therapy have not been impressive. There is, however, one condition in which benefit from A.C.T.H. or cortisone therapy may be expected in about half the cases.

In nephrotic children without significant nitrogen retention A.C.T.H. causes the usual tendency to sodium retention, but when therapy is stopped then a diuresis often occurs which leads to removal not only of this retained sodium but also of the greater part of the nephrotic oedema fluid. Younger children respond better than older ones. The child should be put on a low-salt diet with a high-potassium content. Full dosage should be given, a child of 60 lb. (27 kg.) requiring 20 mg. six-hourly for about 12 days, or 60 mg. of gel once daily. During the course particular attention must be paid to the cardiovascular system: signs of increasing jugular venous pressure or of cardiac dilatation will necessitate a reduction of dosage. After six to eight days dosage may be gradually tailed off and then an effective diuresis may be expected in about half the cases so treated.

Conclusion

The catalogue of diseases which benefit from cortisone or A.C.T.H. therapy can be continued very much longer. Inevitably, for some time to come, supply will fall far behind demand, and principles of priority allocation will need to be applied. As a guiding principle, the most economical use of these drugs will usually be in the alleviation of acute situations occurring in inherently recoverable diseases. Chronic diseases for prolonged maintenance therapy should be selected with caution and care. Those chosen should preferably be those where useful life may be restored or where a major economic crisis in a family can be averted by treatment.

Next Refresher Course Article.—"Spectacles," by Mr. J. H. Daggart.

THE PRACTICE OF MEDICINE FOR ANIMALS*

BY

TOM HARE, M.D., B.V.Sc., M.R.C.V.S.

You have invited me to talk about the practice of medicine for animals and to compare it with your own. Please allow me to avoid the abstract and to talk of such living things as doctors and veterinary surgeons; how they learn the one body of knowledge, exploit the same discoveries, meet with the same problems, and use the same methods in trying to solve them.

The veterinary schools are in the Universities of London, Edinburgh, Dublin, Glasgow, Liverpool, Cambridge, and Bristol. Among the medical and veterinary students I find little if any difference in social origin, upbringing, dress, deportment, and contributions to university life. In their hobbies possibly more of the city clings to the medical and more of the country to the veterinary.

Syllabus

In 1912, when I entered the veterinary school of the University of Liverpool, medical and veterinary students together attended the courses in the basic sciences, physiology, materia medica, and general pathology. They separated for anatomy and the clinical studies; but, through the friendships forged in junior days, ways and means of the sharing experience in the schools were devised. A veterinary student disguised in the short white coat would be smuggled into an operation or ward round; medicals in the long white veterinary coat did the meat-inspection tour of the abattoir, studied castrations with relish, or wallowed in the post-mortem examination of a horse. Of course, our teachers knew, and pretended they didn't.

An objective survey of the training of the senior students of the two schools would bog me in a morass of detail. The superiority of the medical training was in its clinical teaching, the art of recording the case history, diagnosis, and prognosis. The highlight of the veterinary training was animal management, a huge subject which includes the characteristics and behaviour of the domestic animals, their husbandry, breeding, housing, feeding, hygiene, transport, and marketing. It equips the veterinary student with standards against which he can compare his patients and assess the efficacy of his treatments and their economic value. I missed such training in my medical course; the teaching about man and his environment was incidental and insipid. The superb qualities of the medical training in hospital tended to condition the student to the outlook of the specialist. Despite the comparative poverty of his intramural clinical training the veterinary student knew it as equipment for general practice and supplementary to pupillage.

Veterinary students are advised to spend the vacations of their first year on farms as a preparation for pupillage. For my pupillage I entered into a written agreement with, and paid a premium to, a partnership of father and son in a mixed town and country practice. The son's house, where I boarded, included the consulting-room and dispensary. It formed one side of a paved yard, which was bounded by operating theatre, garage, smithy, kennels, coach-house, harness rooms, stables, and loose boxes. Facing the office at the entrance were three houses tenanted by the head groom, head shoeing-smith, and chauffeur. There were ten whole-time employees.

The "chief" was strict, just, generous, upright, handsome, and always immaculate. Woe to the yardman if the "chief" picked up a straw or the stub of a woodbine; little escaped

*Presented to the Mid-Herts Division of the B.M.A. on October 10, 1952.

his eye. He had lovely hands, which charmed a knife or a horse. He and his horse were one, a picture of power and grace, which, as he rode to the meet, warmed the hearts of Lincoln folk. He was an external examiner in surgery, a master craftsman, and a leader.

I accompanied the "chief" on his rounds and devilled for him; sometimes, and on most night calls, I went with the junior partner or his assistant. I was expected to memorize particulars of each client, his whims and oddities, his stock and husbandry, and to avoid party politics. Morning surgery began at 8.30, by which time I had dusted the dispensary, helped with the cleaning, feeding, and dressing of the in-patients, packed the gear-bags, and eaten my breakfast. Usually we were off on the rounds by 10.30; the transport consisted of two cars, a motor-bike, and a stable of horses for riding and driving. The night staff came on duty at 8 p.m., by which time I was usually washed and changed for dinner. After dinner on one evening a week stock medicines were put up and stored; farmers ordered them in lots of a dozen for home-doctoring. The system is natural, and fortunately prevails in many practices; the veterinary surgeon knows what his client has already administered and the client takes the credit for all recoveries; *noblesse oblige* goes a long way in the country. On another evening each week the accountant attended to enter up the ledger, while the professional staff deciphered entries in the day-book, costed their journeys, and checked up records of work done for Government, local authorities, and insurance companies.

There was no "clocking on and off"; I do not think it had been invented. There were occasions for leisure and recreation; I had my fill of riding and cricket, and my Sundays, after 10, were my own except for emergencies. The "chief" arranged for me to visit neighbouring veterinary surgeons when they had a particular technique or case to demonstrate; also, as a guest, I attended meetings of the local division. In all I spent 24 crowded, healthy, and happy weeks as a pupil in the practice, and I returned to it as assistant for some of the vacations of my medical course.

From my enthusiasm for pupillage I would not have you infer that it is invariably a success for student or principal. A few students do not seem to have the temperament to enjoy or profit by it. I think the need for improving the medical training for general practice would be met by re-introducing pupillage during the vacations. It would avoid any major upset in the existing system of hospital training, which in some respects is of superb quality.

Surgery

The differentiation of the medical general practitioner from the specialist does not obtain in the veterinary profession. Some veterinary surgeons restrict their practice to a particular animal; others develop a special aptitude, for which they are consulted by their colleagues. The majority of veterinary surgeons undertake major surgery at the patient's home or in their own theatres. Except for emergencies many veterinary surgeons reserve one or more periods of the week for their operations. Usually they have a nurse-secretary to maintain anaesthesia, attend to instruments and apparatus, and dress and nurse patients. All parts of the small animals, except the central nervous system, are explored by the knife.

Major surgery on the large animals is usually done in the open, sometimes at a distance from tap-water and other hygienic conveniences. The physical means for preparing and controlling large animals, during and after operations, have to be carefully planned. Nowadays veterinary surgeons have the additional difficulty of finding competent assistance on farms. For major operations on the viscera there is a preference for the large animal to stand at its manger under local analgesia. Casting the patient on a bed of straw for general anaesthesia, even when skilfully done, severely upsets the animal and influences its after-treatment and behaviour. The less the interference with the

patient's posture and surroundings the better the prognosis. Another limiting factor of major surgery of the large animals is the size of their organs and the difficulty of bringing some of them into the incision through the body wall. Nevertheless, capacious viscera have their advantages: with his arm in the rectum a veterinary surgeon can explore the organs as far forwards as the kidneys.

The structure, functions, and diseases of the foot occupy an important place in the veterinary curriculum. It is the seat of many troubles, to which, in the horse, must be added the many injuries from faulty shoeing and work. Veterinary students receive practical instruction in the smithy. In my medical course instruction about footwear and the everyday troubles of the foot was insignificant.

For measuring a patient's fitness both professions employ similar manual, instrumental, and athletic procedures. When all these have been done for a horse the veterinary surgeon mounts and puts it through its movements and speeds. Riding with skill and judgment, he comes to his diagnosis and something more. In the exhilaration of their rhythmical movements there is evoked a mutual sympathy, which calms the apprehensive animal. I believe this sympathy uniting two creatures to be the essence of "clinical touch." Without it the doctor or veterinary surgeon, for all his knowledge, is a mere technician.

Obstetrics

The pathology of reproduction is a major subject of veterinary practice which adheres to orthodox principles and is admirably set out in the textbooks. It is governed by economics. Livestock owners at subsistence level rarely can afford veterinary obstetrical practice; they make do with primitive methods and ideas. Knowing his hill and his sheep, the shepherd can forecast where and when each ewe will drop her lambs. If a ewe is unable to lamb he does his best to deliver her. If he fails he opens his knife, cuts her throat, opens her abdomen, removes the lambs, clears their nostrils, and fosters them on to ewes with single lambs. Most of the ills of fertility, pregnancy, parturition, and infancy of animals are primarily due to infectious disease. But the voice of Pasteur rarely penetrates to those who look on lambing as the harvesting of a crop and their bread for a twelvemonth.

For three lambing seasons I was working in the Pennine Hills. One bitter night a hill farmer fetched me to his mare. I followed him over the bosom of the hill to a stable, a lamp, the mare, and three chaps fatigued by midwifery. I stripped to the waist, lathered my right arm with soap, corrected the presentation, and the mare delivered her first foal. When I turned to wash in the bucket the farmer said, "Don't waish th'onds lad, cum to th'ole wumon; she's took bad." But I washed and put on my shirt. Next door I had a look at the farmer's wife, sat on her bed, and spoke reassuringly while she gave birth to her third girl. The farmer's diagnosis was shrewd; his wife was a multipara and could wait on nature; the mare's foal was her first and nature was stuck. As for his ideas of hygiene: if hands are mucked in lambing they are wiped on the fleece and you get on with the next job.

Infectious Disease

This is the major problem of veterinary practice. It accounts for more illness than that due to autonomous, physical, and chemical causes. Domestic animals live at risk of infection from diseased contacts, insanitary surroundings, infected food, and diseased wild creatures. They live with their dung, droplets, and discharges, which, as the means of spreading infection, become more potent with crowding.

The notifiable infections, which include rabies, glanders, and anthrax, are specified in the Diseases of Animals Acts and Orders. On detection and report to the authorities they are dealt with by the veterinary officers of the Ministry of Agriculture. Of more concern to general practice are the

endemic infections, such as helminthiasis, coccidiosis, tuberculosis, Johne's disease, brucellosis, and streptococcal infection.

The parasite of the ubiquitous intestinal infection coccidiosis is expelled in the patient's dung. It can survive outside the animal for 18 months. In young animals the infection tends to an acute course with a high mortality; in adults it is a common cause of invalidity. Coccidiosis is curable, but, relative to the market value of the animal, the treatment is costly in drugs, labour, and time.

Infection by the haemolytic streptococcus is also very prevalent in domestic animals. Its foetal and infant mortality and adult morbidity rates are high. When penicillin and sulphonamides can reach it, as in septicaemia, they slay it. But the spread of the haemolytic streptococcus is by droplets, and its natural habitat is mucous membrane, particularly that of the pharynx. Under the protective coating of mucus it is relatively quiescent for a period, and then it has a burst of activity, during which it produces a toxæmia. Also from mucous membrane it may emigrate to sites of stress, such as the pregnant uterus, the mammary gland of the milking cow, or the strained capsule of a horse's joint.

From what I have said of endemic infection I would not have you infer that usually the animal patient is suffering from only the one species of parasite. In the large majority of my cases more than one specific infection was found: three specific infections were found in about 10% and four or more in about 3%. The symptomatology of polyinfection may be far removed from the sum of the signs expressed by each specific infection. Animals infected by the haemolytic streptococcus and suffering from coccidiosis show spasmodic, which varies from the intermittent spasms of a single muscle in the mild case to the tetany, hysteria, or epilepsy of the more severe case.

Prophylaxis

In my experience the incidence of endemic infection has been increasing during the past 25 years. I see no signs of the reverse trend. This is a disappointing contrast to the impressive advances in diagnosis and specific biological and chemical treatments. Moreover, the meaning and value of these advances have been made known to stock-owners by their veterinary surgeons through the advisory schemes of the British Veterinary Association and Ministry of Agriculture. The technical means for subduing endemic infection are available, but it is not being subdued. Why?

The responsibility for seeking and accepting veterinary advice rests on the stock-owner, who tends to refrain from anticipating disease, and, after it has come, to set a greater value on curative treatment and prognosis than on specific diagnosis and prophylaxis. This attitude is encouraged by the fact that animals suffering from endemic infection are convertible into the nation's meat ration. The practices of the stock-owner are a contributory but not the essential cause of the rising incidence of endemic infection. To illustrate this I will cite one of my experiences. The story began with two sows on a farm and a public demand for pork. The two were multiplied to two dozen sows, which bred litters averaging nine. The farmer increased his pig population beyond his resources for clean husbandry. Parasites multiplied and increased the mortality and morbidity rates. The demand for pork declined and increased the farmer's losses. The story ended in the fifth year with two sows on the farm.

Wherever animals are assembled together in farm, field, market, showground, ship, and hospital, their parasites appear. They appear with the undetected infected animal. They spread in its dung, discharges, and droplets. This is no new knowledge. It and the essential preventive methods were systematized during the second half of the nineteenth century and incorporated in the veterinary curriculum as the hygiene of animal management. Fifty years ago the veterinary profession was advocating routine cleanliness as an effective control of such endemics as tuberculosis and Johne's disease; it does so to-day. Forty years ago I began

my pupillage in a practice of which the animals, equipment, and buildings were kept as clean as a new pin. To keep them clean was a veterinary surgeon's duty, pleasure, and pride. It was so even 20 years ago with many city veterinary surgeons, who maintained large establishments for the treatment of small animals. To-day the maintenance of an animal hospital is beyond the means of private practice. The routine cleanliness of animals and their surroundings can be effective demands intelligence, ceaseless vigilance, and rained labour.

Faced with the difficulty of obtaining the trained labour, and its high cost, the veterinary surgeon has dispensed with his animal hospital. The farmer, faced with the same economic problem, has to keep his animals, saturate them in antibiotics, and trust to luck. To-day all of us are haunted and frustrated by the same ghost. Few of us can afford to keep our homes as clean as we did. I do not see medical hospitals so well scrubbed as in my student days. Cleanliness is too expensive, and its practice fades as the welfare State slides into slumdom.

My selection of vignettes of veterinary medicine must end here. It has been a great privilege to show them on behalf of my friends in general practice. Instead of presenting their thoughts and experiences I seem to have given you far too many of my own. My only defence is to acknowledge them as my own, the best I have to give you.

ELECTRONICS AND MEDICINE

[BY A SPECIAL CORRESPONDENT]

The eighth annual exhibition of the Institution of Electronics, organized by the North-west Branch, was held at the College of Technology, Manchester, from July 15 to 21. It was opened by Sir Geoffrey Jefferson, F.R.S., emeritus professor of neurosurgery at Manchester University. The exhibition was organized in two sections: a Scientific and Industrial Research Section, in which the applications of electronics to medicine featured prominently; and a Commercial Section displaying the astonishing versatility of this infant science in solving the problems of modern industry.

The Christie Hospital and Holt Radium Institute, Manchester, demonstrated the precautions necessary in handling radioactive isotopes, and also the uses of I^{131} in estimating thyroid function, P^{32} in treating chronic leukaemia and polycythaemia and in locating brain tumours, and of radio-cobalt in irradiating neoplasms. The Department of Medical Physics, Leeds University, showed an arrangement for taking dynamic measurements of blood pressure, using a blood-pressure manometer and commercial capacitance meter which is easily constructed and apparently trouble-free. Other exhibits by this department included an electromyograph and an experimental scintillation counter in which the difficulty of distinguishing signal and noise impulses has been overcome. The Lewisham Hospital exhibit showed how x-ray films can be automatically named and numbered, and also an apparatus for recording foetal heart sounds audibly by loudspeaker and visually on both cathode screen and tube. This instrument has already been in use for about 18 months for research purposes.

The Postgraduate Medical School, London, exhibited a number of interesting devices including a trigger mechanism for taking x-ray exposures of the heart when studying the relationship of cardiac volume to the E.C.G. cycle; an exposure meter for low light levels, as, for example, in photomicrography; and an amplifier for recording uterine contractions and cervical dilatation. The mechanical heart-lung machine recently described by Melrose and Aird in the *British Medical Journal* (July 11, p. 57) was also on view: it is an impressive example of what can be achieved by combining the skills of medicine, engineering, and electronics. The Department of Physics, Royal Cancer Hospital, London, had a very fine piece of machinery for recording

visually on a large television screen the distribution of ionizing radiation. But the exhibit of the Radiochemical Centre, Amersham, was disappointingly limited to a high β source emitter. No attempt had been made to show the work of the Centre in supplying radioactive isotopes for medical use; even a request for a catalogue of the preparations available met with the reply that the catalogues had all been taken up at a recent Continental exhibition.

The Commercial Section of the exhibition introduced one to a Jules Verne world of streamlined grey boxes and flickering eyes which appeared to be capable of telling one everything about everything, from counting the various emissions of radioactive isotopes to telling how thick one's cigarette paper is, from determining the quality of a turbine blade in a jet engine to measuring the amount of haemoglobin in the blood. A handy table-model electron microscope will photograph bacteria at $\times 60,000$ magnification, or one can sit back in a chair at the console model of the flying-spot microscope while pathology slides are projected on to a television screen for leisurely consideration.

Preparations and Appliances

COMFORT IN CALLIPERS

Dr. H. L. ROGERSON, of Bergh Apton, Norfolk, writes: A few years ago I complained in the correspondence columns of the *Journal* (1948, 2, 724) of the antiquated design of the walking-calliper. Recently, seeing that no advance had apparently been made, I thought that, as a patient and doctor with some enthusiasm for mechanical devices, I was myself in a fair position to design and have made a walking-calliper for my own use. This I did, and for 18 months have worn the resulting product in complete comfort.

My poliomyelitis is of eight years' duration, my right leg being completely paralysed up to and including the muscles around the hip-joint. The left leg is paretic to the extent of about 50%, but no calliper has been needed for this leg.

I had two main objectives, lightness in weight and as near perfect fitting as possible. A paralysed leg, even without any attachment, feels heavy and cumbersome. Lightness has been achieved partly by simplicity in design as well as by the use of duralumin, and the total weight of the instrument is 3 lb. (1.36 kg.). A high standard of fitting has been obtained by wearing the instrument in its skeleton form at first, and returning it to the makers for adjustments until considered perfect. In my case it was returned three times in the rough state before the final finishing process.

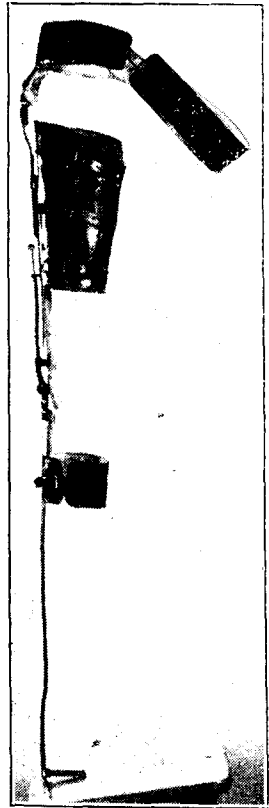
The basis of the design is the use of one "iron" only. This, in my case, for a weight of less than 140 lb. (63.5 kg.), is of duralumin strip $\frac{3}{4}$ in. (1.9 cm.) wide by $\frac{1}{4}$ in. (0.6 cm.) thick. The following are the details of construction, starting at the proximal end of the instrument.

The pelvic band is of the usual type, but without the usual metal stiffening. This stiffening is most uncomfortable for the thin patient and quite unnecessary, except as a mounting for the band in the form of a strip about 6 in. (15 cm.) long, shaped to fit comfortably below the iliac crest on the affected side. The band mounting is attached and hinged in the usual manner, so that the hinge is just clear of the skin over the greater trochanter of the femur. It is important that the portion above the hinge be moulded inwards so as to fit accurately, with its upper edge passing just inferior to the anterior superior spine of the ilium.

The leather thigh casing of usual design is laced in my original instrument, but the straps shown in my duplicate instrument are equally satisfactory.

The knee hinge is self-locking in extension and can be unlocked either directly at the knee or indirectly by means of the extension, which can be reached by a hand in the trousers pocket. The locking assembly is spring-loaded.

The eccentric arrangement of the hinge whereby the ratchet protrusion disappears on flexion between the two outer circular layers is worth adopting on account of the lessened damage to clothing. The below-knee cage is of usual design and strapped. It is fitted so that the upper level just covers the tuberosity of the tibia.



From the knee to the heel down the outer side of the leg passes the single duralumin strip, which is shaped so that it is approximately parallel to the outer side as it passes down the leg. The heel of the shoe is provided with a round socket in the usual manner, and the iron bar which enters it is 2 in. (5 cm.) long. This side strip just described, since it is not strapped to the leg or shoe in any way, is sprung in slightly towards the heel to prevent its coming away from the heel of the shoe of its own accord. In my case this arrangement has been entirely satisfactory, and only rarely has the rod shown a tendency to come out to the extent of about $\frac{1}{4}$ in. (0.6 cm.). Sitting with the legs crossed has been the only cause of this, and the bar has clicked back again when the knee has been re-extended. A toe-raising spring has not been necessary, the foot, when lifted off the ground during walking, remaining at right angles to the leg. The distribution of weight-bearing

between the tuber ischii and the heel is important, and approximately 50% to each site has been the aim. It is also important that in full extension during standing there is no feeling of strain at the back of the knee as though hyperextension were being produced.

A good and simple way of testing the instrument for perfect fit is to ask the patient to stand with the weight of the body equally divided between both feet. If the knee cage is undone there should be no flexion at the knee, and therefore the patient should have no feeling of insecurity. Now, if the knee cage is refastened and the thigh casing unlaced, there should still be no flexion at the knee and no feeling of insecurity.

There is no doubt that an instrument with a single bar is much more comfortable than one with a double bar, and not the least luxury is the ability to sit down with one's knees touching each other.

I have to thank Messrs. F. G. Ernst, of 110, Great Portland Street, London, W.1, for their co-operation in making this instrument to my specification.

Trusts and Foundations, a valuable select guide to the charitable trusts and other grant-making bodies in Britain and the Commonwealth, has recently been published by Bowes & Bowes Ltd., Cambridge, price two guineas. The book has been compiled by Mr. Guy W. Keeling, a former secretary of Aslib and of the Library Association. It represents the first serious attempt to bring together in a single volume all the available information on nearly 1,000 charitable trusts and foundations. Entries are arranged alphabetically and give full details of the trustees and the history, purposes, provisions, and conditions of the trusts. There is also an alphabetical subject index and a subject index classified by the Dewey decimal system. This most useful book will go a long way to filling the need for such a guide expressed in the report of the Nathan Committee on the Law and Practice Relating to Charitable Trusts.

Correspondence

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

The Banning of Heroin

SIR,—Your annotation (*Journal*, July 25, p. 196) on this subject concludes that omission from the B.P., 1953, of heroin would be a most respectable precedent for Government authorities to make the use of the drug illegal. Now a precedent tends to be used as justification for further bans on liberty of action, and should be regarded most critically before being accepted. The main argument for the disappearance of heroin is that it is a drug of addiction, a fact which is exemplified by 500,000 Egyptians in its toils. It may be significant that this huge number has developed since the institution of repressive measures against the less harmful cannabis, which used to render the appalling conditions of the fellaheen endurable. By and large it may be accepted that widespread drug addiction is the outcome of poverty, ill-health, and misery, and it is to the remedy of these conditions rather than interference with therapeutics that governments should direct their energy and money. If the argument that heroin can be satisfactorily replaced by other drugs is sound, no exception should be taken to its banishment. But is this, in fact, the case? Clinical impressions may be notoriously fallacious, but they are not always so, as was exemplified in the history of ergot by the triumph of the general practitioners when ergometrine was discovered.

The incidence of vomiting, often severe, from morphine is high; that following heroin is rare. Amidone and pethidine are by no means as reliable as the first-mentioned drugs, and pethidine vomiting can be troublesome. Are we to suffer our patients to vomit for the sake of potential addicts? As to the suppression of cough, it is true that in adequate doses codeine will be effective, only too often, however, with the addition of severe constipation, lethargy, and depression.

The laws governing the use of dangerous drugs in this country are very strict, and rightly so. Let us then not give countenance to remote control by an organization detached from the day-to-day problems presented by the sick and suffering.—I am, etc.,

London, W.1.

A. H. DOUTHWAITE.

Sex Ratio at Birth

SIR,—I was much interested in your annotation on this subject (*Journal*, July 18, p. 142) and would like to draw attention to two further aspects.

The inconstancy of the sex ratio at birth is well established. Judging from the decennial census figures (my source was *Papers of the Royal Commission on Population* Vol. II), this ratio was quite close to 100 boys per 100 girls born during the period 1841–1901. Thereafter, it rose steadily so as now to stand at approximately 106. The tables in the above-mentioned source do not show the sudden rises in sex ratio at the time of the two wars referred to in the annotation, but merely a steady climb.

The explanation of changes in the sex ratio at birth is as you rather indicate, not altogether satisfactory, and I would venture to suggest what must be an important factor in determining these changes—namely, variations in the abortion rate. This depends upon the fact that the primary sex ratio—that is, the number of males to females at the time of conception—is a good deal higher than the ratio at birth; the evidence for this conclusion is the excess of male over female abortuses. Just as, in post-natal life, the human male at all ages has a higher death rate than the female, so, it seems, does the male foetus in intrauterine life. The primary sex ratio is, of course, indeterminate, but

the available evidence places it at about 120 males to 100 females conceived. It is easy to show that an increase in the abortion rate will lower the sex ratio at birth while a decrease in the abortion rate will raise it. One possible explanation, therefore, for the steady rise in the sex ratio during the last half-century is a progressive fall in the abortion rate, perhaps the result of steadily improving ante-natal care.

By making use of the considerations in the above paragraph, I was led to the conclusion that the spontaneous abortion rate is probably nearer 20% than the 10% figure usually quoted. In a series of pregnancies occurring among women attending a fertility clinic (where the likelihood of overlooking spontaneous abortion was small) the abortion rate was 19.1%; the sex ratio of the babies born was 107 males per 100 females. Being so close to the general sex ratio at birth, it was reasonable to suppose that the abortion rate was not dissimilar from the general one. Had the latter in fact been only 10%, the sex ratio of the babies in this series should have been about 92 for a 19% abortion rate.—I am, etc.,

London, W.C.1.

G. I. M. SWYER.

SIR,—For the research worker much of the interest of variation in the sex ratio of live births has derived from the possibility that it reflects variation in the ratio at conception. Since the sex ratio of live births is influenced by the incidence and sex ratio of foetuses lost as abortions and stillbirths, reasons have recently been suggested for doubting whether this interpretation is correct.¹ The composition of abortions and stillbirths by cause of death changes from month to month of gestation, and the various causes have different sex ratios. Indeed, it is not even certain that the sex ratio of the same cause of abortion and stillbirth remains constant throughout pregnancy—for example, the sex ratio of anencephalus (expressed as the percentage of males) increases from about 20 at 7 months to 40 at 9 months. It is therefore certain that variation in the sex ratio of live births in association with war, birth order, maternal age, and social class is influenced by changes in the incidence and composition of abortions and stillbirths, and it is possible that there are no corresponding changes in the ratio at conception.

In view of these results the statement in your annotation (*Journal*, July 18, p. 142) that "variations in the sex ratio at birth are due to variations in the composition of the birth orders forming the population" is clearly inadequate. And since birth order is only one of the variables with which variation in incidence and composition of abortions and stillbirths is associated, the statement is also inaccurate.—We are, etc.,

Birmingham.

C. R. LOWE.
THOMAS MCKEOWN.

REFERENCE

- ¹ McKeown, T., and Lowe, C. R. (1951). *Hum. Biol.*, 23, 41.

A.C.T.H. in Delirium Tremens

SIR,—Within the last few months I have had the opportunity of treating two cases of delirium tremens with A.C.T.H. I am not aware of any similar published cases, though there may be many, but the results of treatment were so rapid and favourable in both cases that it might be worth while recording these.

Case 1.—A man aged 30 years was admitted to hospital acutely delirious and with the usual hallucinations. The attack may have been precipitated by a wound, accidentally sustained, on the back of the right hand which severed one of the extensor tendons. In a few days, after treatment with sedatives, vitamin-B complex orally, and large doses of vitamin B₁ parenterally, the mental condition had considerably improved and it was decided to suture the cut tendon. He was anaesthetized with thiopentone intravenously and the operation was completed in 18 minutes. From this day the patient sank into a state of low muttering delirium; his temperature rose and ranged between 100° and 103° F. (37.8° and 39.4° C.), and he became completely disorientated as to time and place. Blood films were negative for malarial parasites. He lay on his back and frequently reached forward with his hands, going through the "rope-climbing"

movements which are said to be typical of serous "meningitis" (wet brain). Lumbar puncture produced normal cerebrospinal fluid at a pressure of 110 mm. Penicillin, streptomycin, and sulphadiazine had no effect on the fever.

Fourteen days after the operation and 20 days after admission to hospital, it was decided to try 20 units of A.C.T.H. every six hours. After two doses the mental condition had improved almost to normal, and in 24 hours he was perfectly sane. The temperature dropped to normal in 24 hours and convalescence was rapid after that. The A.C.T.H. was gradually reduced to 5 units once daily, and this was continued for three days and then stopped.

Case 2.—A woman aged 57 years was admitted to hospital in subacute delirium, completely disorientated as to time and place, restless and running a temperature of between 98° and 100° F. (36.7° and 37.8° C.). After 24 hours she was given 40 units of A.C.T.H. every eight hours, and after one dose the mental condition was almost normal. Recovery was rapid and the patient was discharged in six days. The A.C.T.H. was stopped after four days, by which time it had been reduced to 20 units once daily.

The striking feature of these cases was the extremely rapid response to A.C.T.H. Case 1 was in a critical condition, so much so that a relative had been notified and was about to fly out from England, but he responded to treatment almost as quickly as the other case. Twelve hours after the start of treatment he was able to speak intelligently on the telephone.—I am, etc.,

Georgetown, British Guiana.

S. C. BETTENCOURT-GOMES.

Malaria in Ex-Servicemen

SIR,—Last year a number of attempts were made to draw the attention of practitioners to the possibility of malaria occurring in men recently returned from military service in the Far East.¹ A steady stream of such cases with *P. vivax* (B.T.) malaria is still being admitted to the Hospital for Tropical Diseases (U.C.H.), London. Unfortunately, owing to misdiagnosis, a proportion are unnecessarily ill on admission here. Some give a history of fever for two months or more, having a haemoglobin between 50 and 60%, and spleens palpable well below the left costal margin. They have been treated for pyelitis, bronchitis, or gastro-enteritis. The majority have served in Korea.

It should be realized that proguanil, which is issued daily to soldiers in malarial areas, is an excellent suppressive drug but not a causal prophylactic for B.T. infections. Therefore, if these men were taking it as ordered, they will give no history of a previous attack of malaria. The latent period is often long in the Korean cases. Six months or more may elapse between the stopping of proguanil and the onset of fever.

If the possibility of malaria as the cause of fever in men who have served in the Far East is remembered, a positive blood slide will establish the diagnosis, provided that no antimalarial drug has been given. It is with the hope of bringing this condition once again to the attention of general practitioners throughout the country that this letter is written.—We are, etc.,

London, N.W.1.

A. F. KNYVETT.
F. D. SCHOFIELD.

REFERENCE

- ¹ *Lancet*, 1952, 2, 45, 288.

Rubella

SIR,—During the last two years I have seen three cases of German measles associated with "rheumatic" pains. All three were women, between the ages of 25 and 35 years. All three complained of pains in the eyes, which they felt on moving the eyes, thus suggesting that the origin of the pain was in the external ocular muscles.

All three, however, did not recover immediately. One, a lady of about 27, was left with a pain in her left wrist joint, and she was referred to an orthopaedic consultant. His opinion was that this was a simple arthritis of infective origin. It did not respond to salicylates, but subsided eventually. The second lady, aged 34, who was treated with salicylates as soon as German measles was diagnosed, was left with generalized rheumatic pains in her back, arms, and

legs. This went on, although gradually subsiding, for about seven months. The third lady, aged 32, who was also treated with salicylates, recovered completely in ten days.

In J. J. Conybeare's *Textbook of Medicine*¹ there is the sentence: "Neuralgic and 'rheumatic' pains and mild encephalitis have occurred as complications [of German measles]." I have never seen the encephalitis, but neck stiffness, due to occipital lymph node enlargement, together with pain on moving the eyes (not photophobia), did once suggest it.

In allergic conditions, particularly in serum sickness, similar pains in the joints are encountered, which may persist long after the acute condition has passed off in one or in many joints. These pains are sometimes referred to as polyarthralgia, which, of course, describes the symptom but not the disease.

For my part, I regard these phenomena as similar to those which we find in the beginning of the majority of infections. The pains are usually in the muscles, and it would appear that in the more severe conditions, lesions, presumably exudative, occur in the joints. In my experience, in German measles there is a tendency for the pains to persist for some months afterwards. Conybeare has it that a "multiple arthritis may occur in the course of many diseases, such as pneumonia, dysentery, scarlet fever, pyaemia, syphilis, gout, and typhoid." Beaumont, in his book *Medicine*,² mentions that some authorities believe that focal sepsis produces "a chronic allergic state, which on stimulation results in acute rheumatism."

In my view, the similarity between the joint pains in serum sickness and those in German measles—and indeed many other infective conditions—should lead us to regard these phenomena as allergic.—I am, etc.,

Barnard Castle.

K. H. PICKWORTH.

REFERENCES

- ¹ *Textbook of Medicine*. E. and S. Livingstone, Edinburgh. 1949.
- ² *Medicine*. J. and A. Churchill, London. 1953.

Transverse Arrest of the Head

SIR,—Although not wishing to prolong this correspondence, I think a few simple facts concerning Kielland's forceps may call for emphasis. Dr. E. Parry Jones's letter (*Journal*, June 6, p. 1278), which I read with great interest, is a notable account of the history of these forceps, but it taught me scarcely anything about their use that I did not learn nearly 20 years ago. I certainly doubt whether as a result of its publication present-day British obstetrics is going to see a great surge back to Kielland's, nor, indeed, will Dr. Parry Jones expect it; they have a place, but essentially a limited one. So far as their use by general practitioners is concerned, surely comparatively few possess a pair, since their purchase would hardly be justified in domiciliary practice. I use my own pair quite rarely in spite of being very fond of them, and so far as I know I use them as aptly as most obstetricians. The method of application surely is very much a matter of personal preference. I do not care for the "wandering method," but every craftsman differs slightly in his methods, and it seems rather pedantic for Mr. Bryan Williams (*Journal*, April 18, p. 865) to declare that "the classical method . . . is nowadays unnecessary," though he may be assured I have always admired him as a sound obstetrician.

As a practising obstetrician I hope I shall be required to deal with transverse arrest of the head many more times, and I shall deal with each case slightly differently, as befits any artist loving his craft. I regard Kielland's forceps as another trick in the bag of the experienced obstetrician, but I cannot quarrel with one of Professor Gilbert Strachan's eminence when he wrote some years ago, "The main indication for their use is transverse arrest of the head . . . but this type of case is rare and can usually be treated by other methods, while the forceps are difficult to apply. Therefore, although they attracted some favourable attention when they were first introduced, their use has largely been abandoned."—I am, etc.,

Liverpool.

H. VINCENT CORBETT.

REFERENCE

- ¹ *Textbook of Obstetrics*, 1947, p. 630. London.

Generalized Actinomycosis with Possible Cardiac Involvement

SIR,—I read with interest the case reported by Drs. R. S. Savidge and D. M. Davies (*Journal*, July 18, p. 136). I note that a blood culture yielded a spore-bearing organism which was rejected as a contaminant. In the final sentence of their discussion they stress that in cases of doubtful pyaemia an unusual spore-bearer isolated from a blood culture should not be lightly disregarded.

Had the spore-bearing organism from this patient's blood stream been further investigated it would have been of but little assistance in arriving at the correct diagnosis, since *Actinomyces bovis* does not, of course, form spores.—I am, etc.,

London, S.E.1

KEVIN ANDERSON.

Controlled Respiration and Apnoea in Anaesthesia

SIR,—Drs. G. J. Rees and T. C. Gray (*Journal*, July 11, p. 97) refer to an article by Cournaud and his colleagues written in 1948.¹ I think it only right to point out that this article refers to some experiments carried out on the cardiac output of 29 human subjects when exposed to various types of intermittent positive pressure breathing in the conscious state, using respirators that "followed the slightest breathing efforts of conscious patients."

Undoubtedly there was little disturbance of cardiac output when the correct type of intermittent pressure was used, but can it be assumed that these results apply equally well to the apnoeic, curarized patient? They may give a sense of security to the anaesthetist who is using "assisted" respiration, but I should like to see some convincing results from experiments which measured the cardiac output during "controlled respiration" in the completely atonic, apnoeic patient. Further, the investigation should cover both cases with and without their chest cavities open, because I feel that the problem is different in the two types of case. We are all genuinely gratified (and perhaps sometimes surprised) to see how well thoracotomy cases do under modern anaesthesia, but for other non-thoracic cases I must agree with Professor E. A. Pask (*Journal*, May 9, p. 1048) "that there are critically ill patients who do better if they are allowed to breathe for themselves." It might be as well to recall the generalization made by Dr. F. Prescott in 1947,² that there was one maxim to be followed whenever a curarizing drug was used: Keep the patient breathing. Perhaps it is old-fashioned to try to keep to this maxim, but I would still strongly recommend its acceptance where possible, particularly by junior anaesthetists.—I am, etc.,

London, N.18.

G. S. A. KNOWLES.

REFERENCES

- ¹ *Amer. J. Physiol.*, 1948, 152, 162.
- ² *Proc. roy. Soc. Med.*, 1947, 40, 596.

Tic Douloureux

SIR,—Dr. R. Wyburn-Mason's article entitled "The Nature of Tic Douloureux" (*Journal*, July 18, p. 119) prompts me to correct a common terminological error which has arisen owing to the incorporation of the unfortunate diagnostic label "tic douloureux" into the English language. The seemingly appropriate translation "painful tic" is, in fact, incorrect and misleading. "Facial neuralgia" is preferable, since the condition is predominantly a sensory disorder, and it avoids the use of the term "tic," which has a specific definition completely unrelated to facial neuralgia.

The word "tic" has appeared in the French literature for the past 300 years to describe such characteristic motor phenomena as eye-blinking, nose-twitching, and head-flinging. It was first defined precisely by Meige and Feindel¹ as:

"a co-ordinated purposive act, provoked in the first instance by some external cause or by an idea; repetition leads to its becoming habitual, and finally to its involuntary reproduction

without cause and for no purpose, at the same time as its form, intensity, and frequency are exaggerated; it thus assumes the characters of a convulsive movement, inopportune, and excessive; its execution is often preceded by an irresistible impulse, its suppression associated with malaise. The effect of distraction or of volitional effort is to diminish its activity; in sleep it disappears. It occurs in predisposed individuals who usually show other indications of mental instability."

It must be emphasized that no definition of tic includes any reference to a sensory component. A survey of the literature on tics and a detailed personal investigation of more than 70 tiqueurs has not revealed a single case of pain accompanying true facial tics. Hence the expression "painful facial tic" which Dr. Wyburn-Mason frequently employs is incorrect.

Dr. Wyburn-Mason states that spasms of painful facial tic are often accompanied by flickering or twitching of the facial muscles or may be associated with facial palsy or spasm (p. 120). The facial movements to which he refers are not true tics. As Wilson² has pointed out, tics and muscle spasms are not synonymous, and even the use of the term habit spasm as an alternative for tic is not strictly accurate, for the same reason. These points will be discussed more fully in a future publication.

In the interests of precise scientific definition a plea is made to reject the incongruous historical term "tic douloureux" and to substitute the more accurate English equivalent "facial neuralgia."—I am, etc.,

Liverpool.

DAVID M. ZAUSMER.

REFERENCES

- ¹ *Tics and Their Treatment*, 1907. Appleton, London.
- ² *Neurology*, 1940. Arnold, London.

Fluoridation of Water

SIR,—In your otherwise excellent leading article on the above subject (*Journal*, July 11, p. 88) you appear to suggest that diet is more important than "fluoridation" in connexion with the control of dental caries. But is it possible, short of another major war, to change the confirmed dietetic habits of the population? Our American friends certainly do not think so. The British public are certainly more long-suffering, but experience hardly suggests that even they are likely to change in favour of a reduced sugar intake and a higher extraction rate of flour for their daily bread.

Is it not rather that diet and fluoridation are two complementary factors both highly desirable in themselves? Fluoridation helps to build a more resistant tooth enamel and a self-cleansing diet reduces the power of the attack. In this connexion I would like to draw attention to an article by Dr. R. Weaver, of the Special Services Branch of the Ministry of Education.¹

In this he compared the results of two surveys which he had carried out on 500 5-year-old children and 500 12-year-old children in both North Shields and South Shields in 1943 and 1949. In North Shields the fluoride content of the water supply is negligible, whereas at South Shields at that time it contained 1.4 parts per million of fluoride. The figures expressed in terms of decayed, missing, and filled teeth speak for themselves. In North Shields the average D.M.F. figure for the 5-year-olds had fallen from 6.6 in 1943 to 4.4 in 1949, and for the 12-year-olds from 4.3 to 2.4. In comparison in South Shields, the natural fluoride area, the figures for 5-year-olds were 3.9 in 1943 and 3.4 in 1949, and for the 12-year-olds 2.4 and 1.3 respectively. These figures show that the dental caries inhibiting factor of fluoride was reinforced by the more rigorous diet of wartime conditions but still showed nearly 50% better figures as far as the permanent teeth were concerned. What is even more striking is that in South Shields there was between five and six times less decay in the upper incisor teeth than in North Shields.

In your editorial reference is also made to the Report of a Select Committee of the House of Representatives to Investigate the Use of Chemicals in Drugs and Foods, 1952. It might also have been pointed out, as indeed the mission's report does, that, in spite of the Select Committee's somewhat cautious conclusions, fluoridation of the water supply of Washington, D.C., itself was started shortly after the publication of its report.

As regards possible long-term toxic effects of the daily ingestion of small quantities of fluorine, Colorado Springs is looked upon as a well-known health resort. The fluorine content of its water supply is 2 parts per million.—I am, etc.,

JEFFREY FLETCHER.

REFERENCE

- ¹ *Brit. dent. J.*, 1950, 88, 231.

The Judet Operation

SIR,—I have read with interest the comments of Mr. A. Webb-Jones (*Journal*, April 25, p. 935) and of Mr. T. M. Hennebry (*Journal*, May 23, p. 1166) regarding pain following the Judet operation. Some pain may follow any type of arthroplasty of the hip-joint whether carried out by the Judet or by the Smith-Petersen method. Though the former operation appears largely to have superseded the latter, at least for the present, it seems dubious if there is much to choose between the final results. Subsequent pain may be due to a variety of causes, of which I would suggest the following as being the more important.

Muscular Insufficiency.—If the operation is carried out on a person whose muscles are weak on account of poor physique, advanced age, atrophy from long-standing stiffness or disuse, or on one who is ill-adapted to co-operate in after-treatment, subsequent ambulation imposes an undue strain on these muscles, with resulting pain. This usually passes off in time as tone is regained, but some selection of patients is necessary. Those with poor muscles that are unlikely to improve may be better served by arthrodesis.

Post-operative Periarthritis.—Post-operative wound infection or "sub-infection" may cause fibrosis and painful stiffness. This may yield to manipulation, but a new operation may be needed. Fibrosis and painful stiffness may similarly be caused by unsatisfactory haemostasis at operation. If haemostasis cannot be made complete by ligature, diathermy, or coagulating substances, the wound should be drained. Bone chips and bone dust are potent causes of aseptic inflammation and fibrosis, and these must be completely removed. Digital exploration is the most effective means: if cotton gloves are placed over the rubber gloves at this stage of the operation, the rubber gloves are protected from puncture, and the use of a layer of cotton may mitigate the opposition of those who regard any departure from a rigid "no-touch technique" as anathema. I have reoperated upon patients in whom the capsule has been so impregnated with bone dust from reamers that it resisted a scalpel and had to be cut with an osteotome.

Subluxation.—Subluxation is due to failure adequately to deepen the acetabulum, a point of detail so often emphasized by Dr. Smith-Petersen. It stretches the rotators and produces pain in the groin. It can readily be recognized by taking an x-ray picture while the affected hip is bearing weight.

No Capsulectomy.—Complete capsulectomy is not usually considered to be essential routine in the Judet operation, but if not carried out where indicated the result is likely to be disappointing. Some arthritic hip-joints have very thick rigid capsules which contribute largely to the stiffness, and removal of such obstacles to movement is imperative.

Venous thrombosis and thrombophlebitis.

Finally, I would agree with Mr. Hennebry's remarks regarding the obsolescence of displacement osteotomy. This operation has no advantages over simple abduction osteotomy with nail and plate, which is occasionally indicated in cases with reasonable movement where there is marked distortion with coxa vara and also adduction deformity. Simple abduction osteotomy is less mutilating and can more readily be followed by arthroplasty at a later date if needed.—I am, etc.,

Melbourne, Australia.

F. V. STONHAM.

Post-mortem Examinations

SIR,—I do not know whether Dr. C. F. J. Baron, H.M. Coroner for Surrey (*Journal*, July 18, p. 152), is being facetious in accusing me of inaccuracy in my letter (*Journal*, July 4, p. 44). I hope he is not providing an excuse for by-passing the direction in Rule 4, paragraphs 1 and 2(b), of the Coroners Rules, 1953. Rule 4 is long, and for brevity's sake I did not quote it all. No one expects the impracticable to be done. The Coroner (through his officer) and the

doctor decide when the necropsy will be done having regard to all the circumstances, and the general practitioner is then informed. If the general practitioner asks for a different time that is arranged if practicable.—I am, etc.,

Worthing.

W. O. PITT.

*Paragraph 4 (1) of the Coroners Rules, 1953, reads as follows: "Where a coroner directs or requests a legally qualified medical practitioner to make a post-mortem examination, the coroner shall inform the persons and bodies set out in paragraph (2) of this Rule of the date, hour and place at which the examination will be made, unless it is impracticable to inform any such persons or bodies or to do so would cause the examination to be unduly delayed." Paragraph 4 (2) of the Rules reads: "The persons and bodies to be informed by the coroner are as follows: . . . (b) the deceased's regular medical attendant; . . ."—ED., *B.M.J.*

Cancer and the Public

SIR,—Lord Horder in his letter (*Journal*, July 18, p. 148) concerning cancer education states that "there are opposing views among medical men and laymen." This is undoubtedly true, but after many years' experience of such education I am convinced that if a questionnaire were sent to laymen and laywomen it would be shown that an overwhelming majority are in favour of cancer education. This conviction is further strengthened by the work I am doing in Yorkshire.

Recently the Yorkshire Council of the British Empire Cancer Campaign decided to try to assess the value of cancer education in York, Hull, and the East Riding (Scarborough about to be included). To carry this out, information concerning the symptoms "suggestive of the accessible cancers" is being distributed by means of lectures, pamphlets, etc., and the results will be judged by any change in the delay that occurs between such symptoms being noticed and the doctor visited, also by the number of early-stage cases of cancer arriving at the hospitals. Statistics of these symptoms and the number of early-stage cases of cancer are being collected in ten hospitals in the area.

When the work first started, I wrote—after obtaining the co-operation of the local authorities—to every general practitioner and consultant in the area. I asked if they would co-operate in the investigations (a) by filling in a special printed letter giving the "delay figure" whenever they send a patient to hospital complaining of any symptoms which the public are being taught should be reported without delay, and (b) by volunteering to give lectures. Of the 247 general practitioners written to, 129 (52.2%) replied. Of the 129, 128 agreed to fill in the letter, one refused, and 33 have volunteered to give lectures, the latter number including some consultants. Many of the consultants answered through their hospital committees, which have agreed to co-operate.

It will take two or three years before sufficient statistics are available to show whether education has diminished the delay in reporting symptoms suggestive of the accessible cancers—symptoms of other cancers are not taught—and the area may have to be enlarged before enough cases of accessible cancers can be collected to judge whether the number of early-stage cases has increased. "Knowledge is the antidote to Fear" (Emerson).—I am, etc.,

York.

MALCOLM DONALDSON.

SIR,—May I suggest that the good which is likely to come of educating the public in cancer may be estimated by comparing the cancer mortality in doctors, nurses, and the lay public? It may be that doctors and nurses have advantages besides education over the lay public, and the lower mortality in the educated groups would not necessarily be an argument for education of the public. If, on the other hand, the mortality is not significantly lower in the educated groups there can be very little argument in favour of a campaign to educate the public.—I am, etc.,

London, W.1.

JOHN GARDHAM.

Obituary

MERVYN H. GORDON, C.M.G., C.B.E., D.M., F.R.S.

Dr. Mervyn Henry Gordon, whose death on July 26 at the age of 81 was briefly recorded in last week's *Journal*, was one of the outstanding bacteriologists of his day. His whole working life was passed at St. Bartholomew's Hospital, where he worked in the bacteriological laboratories for nearly fifty years, living for a long period in High Holborn to be near his work. After his official retirement in 1937 he remained consulting bacteriologist to the hospital.

Mervyn Henry Gordon was born on June 22, 1872. His father was Canon H. D. Gordon, rector of Harting, in Sussex, and his mother was a daughter of the celebrated Dean Buckland. From Marlborough College he went on to Keble College, Oxford, and then to St. Bartholomew's to study medicine. He graduated B.M., B.Ch. in 1898, and proceeded M.D. in 1903, having taken the degree of B.Sc. two years earlier.

Gordon was appointed to the staff of the pathology department at Bart's soon after qualification, and it was not long before his name came to be known for original work of the most enterprising kind. His first major achievement was a study of the aerial transmission of bacteria suggested by the work of Flügge; this led him to practical experiments not only within the walls of his own institution but in no less august an environment than the Debating Chamber of the House of Commons, where his advice was sought about improved ventilation. He established the recovery of salivary streptococci from air as an indicator of aerial pollution from the mouth and throat, and it is a pity that the findings of this extensive and ingenious study are buried in Blue books which must long have been unobtainable.

Streptococci were among his favourite bacteria, and at an early stage he sought to distinguish the streptococcus of scarlet fever from others; his later work on the serological classification of *Str. pyogenes* antedated that of Griffith and Lancefield by ten years, and laid the foundations for it. With Andrewes and Horder he made a systematic study of the characters of streptococci generally, on which their present broad classification into the principal species is still based. The 1914-18 war provided the opportunity for the work by which he will be remembered longest, a widely comprehensive study with Glover and Hine of the epidemiology, diagnosis, and serotherapy of cerebrospinal fever, in the course of which distinct serological types of the meningococcus were defined for the first time. The material for this study was largely provided by epidemics in Army barracks. He had been appointed an original member of the Army Pathological Advisory Committee in 1909, and he continued to serve on the committee for many years. From 1915 to 1919 he was consulting



(Walter Stoneman, London.)

bacteriologist to the Army, being given the honorary rank of lieutenant-colonel. For his services he was appointed C.M.G. in 1917 and C.B.E. in 1919.

In 1923, the year before he was elected F.R.S., he resigned his appointment to the hospital and teaching staff at Bart's and became a whole-time research worker, at the same time abandoning the study of bacteria for that of viruses. His first effort in the new field was an extremely thorough restudy of the properties of the virus of vaccinia, the results of which are embodied in a Medical Research Council report which is now a classic. He also succeeded for the first time in transmitting mumps to the monkey, and took part in the work on psittacosis which followed the discovery that this was a virus disease. In 1929 an opportunity presented itself to organize a team of workers to investigate the aetiology of Hodgkin's disease; this research was supported by the Rose bequest, of which funds had accumulated which were only to remain available for this purpose for a limited period. Gordon's enthusiasm for this project communicated itself to the clinical staff at Bart's, under whose care many patients with Hodgkin's disease and other reticulososes were admitted to the hospital, furnishing the material for valuable histological studies as well as for those aimed more directly at discovering the cause of the disease.

The report on this work, a book entitled *The Rose Research on Lymphadenoma*, may have puzzled some of its readers, since some chapters deal with hypotheses now known to have been false. Gordon's belief about this problem passed through several phases, but crystallized eventually into a firm conclusion that the causative agent was a virus. He observed incidentally that a peculiar form of ataxia, not further transmissible, is produced in rabbits by intracerebral inoculation with affected tissue, and this is widely known as the "Gordon Test." Later observations showed that any material containing eosinophils will produce the same effect. The viral hypothesis rested mainly on the demonstration of elementary bodies, "E.B.s" as he almost affectionately called them, in tissue from patients. Where this eventually led him may be gathered from the paper by him which appeared in this *Journal* no longer ago than April 18 (p. 860). Later he believed that he had incriminated a virus as the cause of fibrositis and acute rheumatism, and he also interested himself in the possible part played by viruses in the aetiology of cancer.

Gordon was twice vice-president of the Section of Pathology and Bacteriology at Annual Meetings of the B.M.A., and in 1938 he was president of the Section. He also served on a number of B.M.A. committees, including the Committee on Research, Causes, and Treatment of Arthritis and the Vaccination and Immunization Subcommittee. In 1936 the honorary degree of LL.D. was conferred on him by the University of Edinburgh.

Gordon was a giant in his earlier days, and did magnificent work despite multifarious duties as a teacher and hospital bacteriologist. At that time he not only examined many specimens, but took the liveliest interest in the patients from whom they came. Some time after he became a pure research worker the methods to which he was accustomed may be said to have failed him for the more difficult and ambitious projects with which he was then faced, and the more refined techniques by which viruses are now studied were developed at a time in his career when few men can adjust themselves to a fresh approach.

As a man he was the most selfless and devoted worker his friends have ever known. He had no interest in money and very little in honours; apart from a fondness for old books and a leaning towards archaeology, he seemed to have no interests outside his work. The simplicity of his life is illustrated by the fact that he used to buy sixpenny ties from barrows in the Farringdon Road—these were also a hunting-ground for old books—and give them an hour in a paraffin oven to rid them of any possible vermin. His work was everything to him, and the enthusiasm with which it was pursued was an inspiration. He handled cultures in a delicate and almost loving way, and delighted in good microscopic preparations. His enthusiasm was not only for his own work, but for that of others, however elementary or unimportant. His junior colleagues, from whom he suffered endless interruptions in quest of his advice, owe him an inestimable debt for the care and kindness with which he went into their problems. Visitors to his laboratory were all the more numerous because he was a most entertaining talker, with an inexhaustible stock of anecdotes, told with immense gusto. No one who heard him will forget the officer with a chance to whom he showed his spirochaetes wriggling under dark ground illumination—"... the fellow was absolutely delighted"—or the officer with beautiful new riding boots which disintegrated as he walked away from Millbank after a new antiseptic had been tried on him in the steam inhalation chamber for treating meningococcus carriers. The high lights of his description of experiments in the House of Commons were the frequent recovery of a characteristic streptococcus from the mouth of a certain Cabinet Minister in plates exposed in the Ladies' Gallery, and the smoke test during which a policeman in the lobby was only just prevented from summoning to Westminster every fire-brigade in London. His stories—and stories about him—still abound. No one at Bart's for many years has inspired or deserved greater affection.

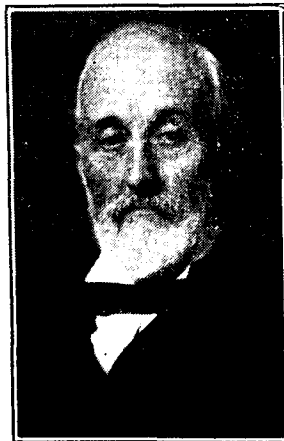
In 1916 Gordon married Mildred Olive, daughter of Sir William Power. She predeceased him by four months, and they had no children.—L. P. G.

R. O. MOON, D.M., F.R.C.P.

Dr. R. O. Moon, a distinguished and scholarly member of the older generation of London consultants, died after a short illness at Wallingford, Berkshire, on July 28 at the age of 88.

Robert Oswald Moon was born in London on March 17, 1865. From Winchester he went on to New College, Oxford, where he read "Greats." When he began his medical training at Guy's Hospital he was rather older than most of his fellow students, and he qualified in 1896 at the age of 31. He took the degrees of B.M., B.Ch., and the diploma of M.R.C.P. in 1899, proceeding to the D.M. a year later. In 1909 he was elected F.R.C.P., and he was assistant registrar at the College from 1926 to 1933. Throughout his long life Moon displayed a remarkable energy and enthusiasm for the object immediately in hand. Shortly after he qualified the urge to serve a worth-while cause took him out to the Balkans, where he worked as a surgeon to the Phil-Hellenic Legion in the Graeco-Turkish War of 1897; and he had hardly obtained his degrees in medicine before he was abroad again, this time to take part in the war in South Africa in 1900 as a trooper in the Hampshire Yeomanry. In 1901 he was appointed a civil surgeon to a field force, with which he went into action, being mentioned in dispatches.

After returning to London he became clinical assistant at the National Hospital for Nervous Diseases, and at the Hospital for Sick Children, Great Ormond Street. Later he decided to specialize in diseases of the heart, and was appointed to the honorary staffs of the National Hospital for Diseases of the Heart, the Royal Waterloo



(Elliott and Fry, London)

Hospital, and the Western General Dispensary. In 1914 war again interrupted his work, and early in 1915 he was back in the Balkans acting as medical officer to Lady Paget's Hospital at Skoplje. Falling a victim to typhus fever, he returned to England, and in 1916 he described his experiences as a patient in his Chadwick Lectures in that year. In the following year he entered the R.A.M.C. as a major.

In the ensuing years he continued to serve on the staffs of the National Hospital for Diseases of the Heart and the Royal Waterloo Hospital, and built up a consulting practice in Wimpole Street. He often took part in discussions at the Royal Society of Medicine, where he was president of the Section of the History of Medicine and St. Cyres lecturer in 1937, and he contributed many articles on this specialty to this and other journals, besides being the author of two books on cardiology, *The Prognosis and Treatment of Diseases of the Heart* (1912) and *The Growth of Our Knowledge of Heart Disease* (1927). His interest in the classics led him to a study of Hippocrates, Galen, and other early medical writers, and in the FitzPatrick Lectures which he gave before the Royal College of Physicians in 1921 and 1922 he discussed Hippocrates and his successors in relation to the philosophy of their time. He was also an authority on Goethe, and published a translation of *Dichtung und Wahrheit* in 1932 and also of *Wilhelm Meister*. In 1938 he translated the autobiography of Goethe's friend, Jung Stilling. Other books of which he was the author were *The Relation of Medicine to Philosophy* (1909)—a subject which always interested him—and *Medicine and Mysticism* (1934).

A well-known member of the Reform Club, Moon made several unsuccessful efforts to obtain a seat in Parliament as a Liberal. In his attitude to life he had a certain toughness that served him well in his early adventures. He was never seen to wear an overcoat, and he enjoyed good health until his fatal illness. He married Ethel, daughter of General Waddington, and had one son and four daughters. His wife died in 1933.

We are indebted to Sir ARTHUR MACNALT for the following appreciation: For Robert Oswald Moon I have always had great affection since the far-off days when he used to take me on cycling expeditions in the country round Winchester. When I came to London as a medical student I often visited him at his house in Green Street—he was then in consulting practice—and we had talks together on the classics, Goethe, medicine, and many other subjects. Moon first contemplated entering the diplomatic service after taking "Greats" at Oxford. To that end he was proficient in French and German, and well read in both languages, becoming an authority on Goethe and Heine. He took up medicine later in life and specialized in diseases

of the heart. Two other fields of action attracted him—politics and military service. In politics he was unfortunate, for as a Liberal he was given entrenched Conservative seats to fight. In war he won distinction. As a student he interrupted his studies at Guy's Hospital for the Graeco-Turkish war. I saw him ride forth from Winchester as a trooper in the Imperial Yeomanry to the South African War. When it was discovered he was a doctor, authority transferred him to the R.A.M.C. In the first world war he nearly died of typhus in Yugoslavia. He spoke to me of his disappointment in not going on active service in the second world war. He was accepted as a medical volunteer for the expedition to Finland, which was abandoned subsequently. His trim figure with pointed beard reminded one of the Elizabethan heroes, and in his distinguished career, like some of them, he was a mixture of the scholar-philosopher and the man of action. In life he fought a good fight in more senses than one, and was a skilled and sympathetic physician, a learned medical historian, and a good friend to many.

JAMES M. WYATT, M.B., F.R.C.S., F.R.C.O.G.

Obstetrics and gynaecology in this country has lost a noteworthy figure in the death of James Wyatt, which took place on July 31 in St. Thomas's Hospital after a short terminal illness, though he had been in indifferent health for a long time. It was only his strength of character and pertinacity in the face of great physical handicaps which had kept him going for the last few years. He died in the hospital in which his entire career had been spent, from his entrance there as a student 53 years ago to his final eight years as consulting obstetrician. There he had taught generations of medical students and pupil midwives, and had established his reputation as one of the foremost obstetricians and gynaecologists of his time.

James Montagu Wyatt was born in 1883, one of a large family, all of whom achieved distinction in their various ways. His father, Thomas Henry Wyatt, was a senior Civil Servant at the War Office. James Wyatt went to the Merchant Taylors School, and from there in 1900 to St. Thomas's, where he was a distinguished student both in the field of sport and academically winning prizes in obstetrics and gynaecology. After qualifying in 1905 he passed through the various residencies, registrar, and tutor appointments in the specialty which he had decided to take up both at St. Thomas's and at Queen Charlotte's Hospitals. In 1910 he took the F.R.C.S., and in the following year graduated M.B., B.S. (London). It was then that his very successful career began with his appointment to St. Thomas's Hospital as obstetric physician to out-patients, and later as gynaecologist to the Grosvenor Hospital for Women. His colleagues were John Fairburn and J. P. Hedley and for many years they formed an excellent team. During the first world war Wyatt's career as gynaecologist was interrupted when he served in the R.A.M.C., T., as a surgeon to the 5th London General Hospital. He was also medical officer in charge of hospital for officers run by Lady Ridley at her home in Carlton House Terrace. After this military diversion he returned to St. Thomas's as obstetric physician and lecturer in midwifery and diseases of women, and eventually in 1936 on the retirement of J. P. Hedley he became senior obstetric physician. As a teacher he was in his element, for he was able to hold the attention of his audience by his effective presentation of his subject combined with a pleasant touch of dry humour. Besides his hospital work Wyatt also had an extensive private con-

sulting practice in Queen Anne Street and later in Harley Street.

The second world war again greatly interfered with his professional life, but he devoted himself wholeheartedly to the welfare of his hospital and medical school. He was responsible for much of the organization behind the move of St. Thomas's down to Surrey, and he was himself warden of the Manor House, Godalming, where a large number of students were in residence. With the return of the medical school to London in 1946 he retired from the active staff of the hospital three years after the usual retiring age, but he became an active member of the governing bodies of St. Thomas's, Queen Charlotte's, and the Chelsea Hospital for Women.

Wyatt was a leading spirit in the foundation of what afterwards became the Royal College of Obstetricians and Gynaecologists in 1929, and was one of its original Fellows. He was vice-president of the College in 1946-9, and also served as a member of the Fellowship Selection Committee and of the Examination Committee, of which he was chairman in 1947-9. The Section of Obstetrics and Gynaecology of the Royal Society of Medicine knew him as a very prominent member, and at one period no important discussion in that Section was complete without some contribution from Wyatt. He entertained his fellow members on one occasion by describing how he had acted as accoucheur to a chimpanzee at the Zoo. For many years he was chairman of the Children's Sanatorium at Holt, Norfolk. He served the Universities of Oxford, Cambridge, London, and Manchester, and the Conjoint Board as examiner in midwifery and diseases of women.

Retirement from active hospital work in 1946 meant for him an extension of activity in wider fields. From 1947 to 1952 he served as representative of the Royal College of Surgeons on the Central Midwives Board. When the South-west Metropolitan Regional Hospital Board was constituted he was from the first a very active member, putting in arduous duty in his zeal to bring the hospital service under the National Health Service Act safely through the perils of parturition. He was an indefatigable committee man, and once, counting up the committees of which he was or had been a member, he found that they came to nearly 40.

Wyatt was a bachelor and was able to devote much of his time to the welfare of his students, being particularly interested in the amalgamated clubs at St. Thomas's. He was president of the Rugby Club for many years, and in this capacity he will be remembered with gratitude by a great number of St. Thomas's men. The Rugby tours based at the Watch House at Mevagissey are the treasured memory of hundreds. He was a generous host and a kindly friend, and his help and advice were always sound and invaluable. His jovial laugh and ability to join in with everyone were characteristic of his geniality. It was typical of his generosity that he lent his lovely house at Mevagissey to many for honeymoons, holidays, or convalescence. Among his other great interests was amateur boxing, and he was president of the Amateur Boxing Association for ten years, being responsible for much of the organizational work which preceded the Olympic Games at Wembley in 1948.

James Wyatt was a happy man, devoted to his work, his patients, his family, and his students. He will be remembered with respect and love by them all.

MARGARET C. TOD, M.B., F.R.C.S.Ed., F.F.R.

Miss Margaret Tod, deputy director of the Christie Hospital and Holt Radium Institute, Manchester, died at her sister's home in Edinburgh on July 26, aged 60, after a long illness borne with the utmost courage in the full knowledge of the inevitable outcome.

Margaret Christine Tod began the study of medicine comparatively late, for during the first world war, after training as a V.A.D. and in physiotherapy, she opened a naval auxiliary hospital with the consent of her father, Mr. T. W. Tod, at her home in Corstorphine, and for four years worked practically single-handed, dealing with patients referred to her by Mr. C. P. G. Wakeley (now Sir Cecil Wakeley), then a young naval surgeon at South Queensferry. The patients were mainly suffering from injuries to bones and joints, and she soon learnt to handle them in a manner now recognized as rehabilitation. She continued this work for four years, at the end of which time she was appointed an Associate of the Royal Red Cross, an honour which she greatly prized.

She began her medical studies at Edinburgh University in 1919, graduating M.B., Ch.B. in 1924 with first-class honours, and being awarded, among many other prizes, the Ettles scholarship and Leslie gold medal for the most distinguished student of the year, this being the first occasion on which this prize was gained by a woman. After holding resident posts at Bruntisfield Hospital for Women and the Royal Hospital for Sick Children, and visiting clinics in the United States, she became F.R.C.S.Ed. in 1926. Further postgraduate work followed, and in 1927 she was appointed honorary assistant surgeon at Bruntisfield Hospital, and later she acted for a short time as temporary assistant surgeon at the Royal Hospital for Sick Children.

After a short period of practising surgery, Miss Tod's interest gradually turned to the treatment of malignant disease, and she accordingly took the diploma of radiology in Edinburgh in 1936, at the same time working in the radiology department of the Royal Infirmary, where she developed the newly established follow-up clinic of malignant cases. After gaining her diploma she worked with the late Mr. J. J. M. Shaw at the Beechmount Annexe to the Royal Infirmary, where radiotherapy was then carried out, being appointed honorary associate assistant surgeon. In 1937 she obtained the post of deputy director, under Dr. Ralston Paterson, to the Christie Hospital and Holt Radium Institute in Manchester, and for the past fifteen years had worked there with great distinction, gaining an international reputation in radiotherapy. She was the author of a large number of papers in this specialty, and latterly undertook several visits, sponsored by the British Council, to South America, to Italy, and to Austria, for the purpose of furthering the knowledge of modern methods of radiotherapy in these countries.

In 1945 she was appointed a member of the Radium Commission, and for the last eighteen months of its existence she acted as secretary to this body. She was a Fellow of the Faculty of Radiologists, and at the time of her death was editor of the *Journal of the Faculty of Radiologists* and secretary of the Radiology Section of the Royal Society of Medicine. In 1951, in recognition of her distinguished work, she was awarded the Röntgen medal by the British Institute of Radiology.

Dr. GERTRUDE HERZFELD writes: Peggy Tod was a woman of outstanding character and ability, and her loss

will be deeply felt by a wide circle of friends in Edinburgh, in Manchester, in Europe, and in South America. Behind a modest and unassuming manner she hid a firm determination to give of her best in her medical career. She was a staunch and loyal friend, honest and sincere, and showed her generosity on many occasions when she helped some of her colleagues who were less well off than she, though her gifts were invariably anonymous. She was a delightful companion, very hospitable, and enjoyed taking her friends through her lovely gardens and woods in Corstorphine, surrounded by Shetland sheepdogs, which she bred for many years. She was widely read, very musical, and interested above all in human beings. Her loss will be widely felt, and we extend our sympathy to her sister, who nursed her so devotedly, and to her nephew.

T. B. SELLORS, M.D.

Dr. Thomas Blanchard Sellors died suddenly at his home in Chesham on July 22 at the age of 80. He led a full and valuable life, being regarded by his many friends as a fine example of the family doctor. Born in Warwickshire on August 21, 1872, he was educated at King Henry VIII School, Coventry, and studied medicine at the Middlesex Hospital. After qualifying in 1898 he entered general practice in South London. Some years later he moved to Westcliff-on-Sea, then a small seaside resort, and worked there for thirty years before retiring to Berkhamsted just before the second world war. During the war he returned to practice, and up to the time of his death never relinquished his interest in medicine and in his old patients. Though primarily a family general practitioner, he made a specialty of dermatology, which led to his being appointed as physician to the Victoria Hospital, Southend, and for many years he acted as clinical assistant to Dr. Harry MacCormac at the Middlesex Hospital, where he maintained a friendship with those members of the consulting staff whom he first knew in his student days. The recent death of Victor Bonney caused him considerable sorrow.

Throughout his career his ability as a teacher was well recognized, and he spent many hours lecturing and examining for the St. John Ambulance Brigade and the British Red Cross Society. He was also a divisional medical officer of the National Fire Brigades Union. During the early days of the first world war he was instrumental in training a Voluntary Aid Detachment which proved of yeoman service in staffing a hospital, and from 1916 to 1918 he served in France as a captain in the R.A.M.C. Shortly after demobilization he took the degree of M.D. at Durham University. In 1944 he was appointed an Officer of the Order of St. John of Jerusalem.

An active member of the British Medical Association, he was president of the Essex Branch in 1931-2. His enthusiasm for Freemasonry lasted until the time of his death, and he contributed several works on the historical aspects of the subject. In his younger days he was a keen cricketer and played until well into middle age, while in later years he enjoyed fishing and playing bowls. The classics and a study of church architecture occupied much of his holidays, and were absorbing relaxations to him after retirement, but these were only part of his diverse interests, which covered motoring, gardening, and carpentry. Indeed, there was little that he could not claim as a hobby.

By his first wife, Anne McSparron, who died in 1943, he had a son, Mr. T. Holmes Sellors, the well-known thoracic surgeon, and a daughter. His second wife,

Mary Edwards, was principal matron of Princess Mary's Royal Air Force Nursing Services, and to her our deepest sympathy is extended.

We are indebted to Sir GORDON GORDON-TAYLOR for the following appreciation: The death of Dr. Tom Sellors in his 81st year brings to mind a group of general practitioners of the very highest type whose sphere of activity lay in the Southend-Westcliff area, and of whom he must have been one of the last survivors. Of West of Scotland stock, he received his medical education at the Middlesex Hospital, and throughout his professional life was an almost constant attendant in the dermatological clinics of the late Dr. J. J. Pringle and Dr. Harry MacCormac. He was himself the dermatologist at the old Royal Victoria Hospital, Southend, for many years. The 1914-18 war took him to France, where he served as a regimental medical officer, and subsequently in the thoracic wards at No. 10 General Hospital, Rouen. He interested himself in good literature, in work for the St. John Brigade, in Freemasonry, and in cricket, being an enthusiastic member of a Southend medical cricket eleven which flourished before the outbreak of the second world war. Loyal to his own Scottish roots, he sent his son to Loretto and survived to see him obtain the high position that he holds in the world of thoracic surgery to-day. Tom Sellors belonged to the very highest type of general practitioner, a group of which this country has reason to be mighty proud.

Medical Notes in Parliament

PRIVATE SOLDIER'S DEATH

Replying on July 28 to seven Questions on the death of Private D. Harrison in a military hospital and the court-martial at which Lieutenant-Colonel A. Gleave was acquitted of the charges against him,¹ Mr. ANTONY HEAD, Secretary of State for War, said:

"Hon. Members will recall that as soon as the allegations of ill-treatment of Private Harrison were brought to my notice I ordered an immediate court of inquiry. On receiving the report of the court of inquiry, I had to decide what I should say to the House on the facts as presented to me, and what action I myself and the responsible authorities ought to take. On June 16 I gave a full and frank reply to the House about this case, and I said that the medical specialist and the day sister concerned would be reported to the appropriate professional bodies. About Colonel Gleave I said, 'As far as I can ascertain, no thorough inquiry was instituted by the commanding officer although on May 18 he stated that a full inquiry had already been made by himself.'

"The commanding officer was subsequently tried by court-martial on charges that he failed to investigate or report the allegations, and that he agreed a statement to the Press that the allegations had been fully inquired into when he knew that they had not. I still believe that the decision that Colonel Gleave should be tried by court-martial was correct, and I would point out to the House that, if he had not been tried, he would have had no subsequent opportunity of vindicating his reputation, which had been impugned. It will be realized that the charges against Colonel Gleave were concerned solely with the action which he took after the alleged ill-treatment of Private Harrison; and I would stress that it was never at any time suggested that the commanding officer was himself personally responsible for that treatment. This fact I felt must be made quite clear in my statement to the House because, had I not been specific about the reasons why Colonel Gleave was to be tried and had I baldly stated that he was to be court-martialled, it might well have appeared by inference that he was alleged to be personally concerned in the treatment of Private Harrison.

"Now that Colonel Gleave has been acquitted on the first charge and honourably acquitted on the second the House will wish to know whether this affects either the evidence or the action taken regarding the treatment of Private Harrison while in hospital. I have now had time to examine the full court-martial

¹British Medical Journal, July 25, p. 230.

proceedings of which I have placed a copy in the Library, and, in the light of them, to review the court of inquiry's evidence where it concerns Private Harrison's treatment. After having done so, I am still of the opinion that the evidence relating to the medical specialist and the day sister should be placed before the appropriate professional bodies.

"I have also reconsidered whether I should institute a further inquiry into all the circumstances of this case. I see no reason to change the view which I previously expressed to the House that this regrettable occurrence did not arise from any fault in the medical system but was due to a failure within that system."

Serious Aspersions

After this statement Mr. Head answered supplementary questions. Replying to Mr. F. J. BELLENGER, who asked whether the Minister had additional evidence which warranted his casting very serious aspersions on the honour and conduct of the commanding officer, Mr. HEAD said his remarks had been based on the court of inquiry and the G.O.C. in C.'s comments on the court of inquiry. Had he made no specific references to why Colonel Gleave was being tried, the public and the House could not have come to any conclusion other than that it was due to his own personal conduct in the treatment of Private Harrison. The holding of a court-martial was not necessarily a sign of misconduct by an officer. It provided an opportunity for an officer to clear his own conduct.

Replying to Mr. M. STEWART, he said his opinion on the evidence presented to him was that there was a fault arising out of the fact that the second thorough and statutory examination after admission was not made. That evidence had been reported to the appropriate professional bodies. As to the cross-questioning of witnesses for the prosecution, the House would appreciate that in a court-martial it would be improper for the prosecution in any way to institute a state of affairs giving special protection of witnesses for the prosecution. The main case for the defence was concerned with the discrediting of the witnesses against Colonel Gleave. Replying to Mr. J. STRACHEY, Mr. HEAD said that, once a diagnosis had been made and those who were acting on it were doing their duty, there was often a tendency to stick to the treatment which had been prescribed despite the fact that circumstances might suggest that it was false. It was due to the fact that this was not spotted earlier that the regrettable occurrence took place.

Pillorying a Specialist

Mr. C. S. TAYLOR asked whether it was not wrong to try to pillory a medical specialist for making what he had admitted to be an imperfect diagnosis. Had not nearly every doctor at some time made a wrong diagnosis? Mr. HEAD said he would be the first to agree about that. What he said about the medical specialist in this case was that it was statutory that another thorough examination should be made after admission. Because that thorough examination was never made he had reported the officer.

Mr. HERBERT MORRISON asked whether it would not be a good rule that when a court-martial was to be held the Secretary of State should not express judgment on a person or on facts likely to be the subject of inquiry at the court-martial. Mr. HEAD replied that he had specified these charges because if he had not specified them it would have been assumed that Colonel Gleave was being tried for his own personal conduct.

Mr. HEAD said he had reminded all hospitals that the existing procedure should be strictly adhered to in all cases of admissions.

Mr. HAROLD DAVIES asserted that the number of patients in the hospital had increased from 150 to 450, but the staffing, apparently, was still the same as when there had been only 150 patients.

Mr. HEAD replied that this was incorrect. The medical officers and the subordinate nursing staff were at full strength. There was a deficiency of 18 nursing officers of the Queen Alexandra's Royal Army Nursing Corps, which

reflected a world-wide shortage. He was trying to increase recruits for that service.

The Speaker then closed the discussion.

Grievous Injustice

In the course of the debate on the Consolidated Fund Bill on July 29 Mr. F. J. BELLENGER said he wanted to ask the Secretary of State for War about the diagnosis made in the case of the late Private Harrison. He could not imagine that in an illness so serious as a malignant disease, which was found out quite quickly when physical examination was carried out, it was not possible to make an earlier diagnosis. He asked why not only the Army doctors failed but also the Ministry of Labour doctors failed to diagnose the disease when they examined the man. Why were no x-ray photographs taken of him? He also questioned whether such men as Private Harrison were really of any use to the Army. Was it any use filling up Army ranks with third-rate individuals who could only be a liability to the Service? He then referred to the personal position of the Secretary of State for War (Mr. Antony Head). He believed that statements made by the Secretary of State in the House before the court-martial had been held had done a grievous injustice to one of his officers. The Secretary of State had said about one of his commanding officers:

"I have been into the whole of this serious occurrence most carefully."

He then went on to say that he was convinced that it was not a fault in the method of procedure, but the failure of certain individuals to carry out their duties. He also said:

"Members of the Army Medical Service carry heavy responsibilities, and those who fail to discharge them must be called to account."

He concluded by saying:

"The commanding officer will be called to account for his conduct in this matter, and is to be tried by court-martial."

Mr. Head had given the impression yesterday that he was giving Colonel Gleave an opportunity to clear himself of certain accusations by way of a court-martial.

Mr. HEAD: Will the right hon. gentleman allow me to explain that these words "called to account" literally mean "given an opportunity to state why"?

Mr. BELLENGER: By his own statement the right hon. gentleman had assumed, as a result of the court of inquiry, that there was a prima-facie case of guilt against this commanding officer.

If the Secretary of State, he continued, thought that Colonel Gleave should be court-martialled he should have said so, but he should not have coupled with that a statement which pointed to Colonel Gleave as guilty of a very serious offence.

Mr. ANTONY HEAD, Secretary of State for War, replied that if he had said that Colonel Gleave would be court-martialled there could have been nothing in the public mind but the inference that Colonel Gleave was accused of being responsible for the ill-treatment of Harrison.

Mr. BELLENGER continued that the Secretary of State had impugned Colonel Gleave's honour. Officers in the Army were not allowed to answer the Secretary of State back. It was therefore incumbent on him to be very careful about what he said, otherwise the morale of the Service might suffer. At the trial defending counsel had referred obliquely to Mr. Head's statement and used it to show that Colonel Gleave had been prejudiced, at any rate so far as his military career was concerned, by something that Mr. Head had said. Mr. Belenger concluded by saying that Colonel Gleave had been acquitted by court-martial of the two limited charges laid against him, but he suspected that the administration of the hospital under Colonel Gleave was not all that it might be.

Dr. H. MORGAN said surely that was a disgraceful charge and insinuation to make against an officer who was now subject to a review of his general conduct in connexion with this incident. It was quite unfair. Mr. BELLENGER said he did not think this was subject to review.

Mr. Head's Reply

Mr. HEAD said in reply that Mr. Bellenger implied there was a scandal in the hospital and that he (Mr. Head) decided to avoid difficulty in the House by being extremely rough with his own officers, but he thought there were few things more contemptible than such conduct. First, Mr. Bellenger had said it was wrong that there were no subsequent examinations of this man after admission to hospital and that was a thing which should be investigated, but he (Mr. Head) had reported the officer concerned to the professional body. Secondly, Mr. Bellenger had said that they should not allow grade-3 men to go into the Army, but it was Mr. Bellenger's Government which had introduced the admission of grade-3 men. As to the charge of a grievous injustice to Colonel Gleave, Mr. Head said that he had the report of the court of inquiry and the G.O.C.'s comments on it, and after consultation with the Director-General of the Army Medical Services and other advisers he decided that the only fair thing was to ensure that Colonel Gleave's Army career would not be prejudiced.

If he had said nothing, the general public would have inferred that it was Colonel Gleave's fault that this boy had had wrong treatment. What Colonel Gleave had been court-martialled for was nothing to do with Harrison's alleged ill-treatment. It was purely concerned with what had happened after it was all over. He believed that that was better for Colonel Gleave. If he was wrong he accepted it, but at the time he was not being vindictive against Colonel Gleave, nor was he attempting to get out of the situation. He thought that was the best thing to do.

Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending July 25 (29th week of the year) were as follows: paralytic, 151 (147); non-paralytic, 115 (76); total, 266 (223). This is an increase of 43 compared with the previous week, the figures for which are in parentheses. Districts which have notified 15 or more cases in the year to July 25, with incidences per 100,000 in parentheses, are as follows: Southend-on-Sea C.B., 32 (21.12); Liverpool C.B., 18 (2.28); Hendon M.B., 15 (9.63); Birmingham C.B., 38 (3.40); Coventry C.B., 53 (20.31); Pewsey R.D.C., 16 (87.77); Manchester C.B., 15 (2.13); Leicester C.B., 15 (5.25); Lewisham M.B., 16 (7.05).

Total notifications remain at a slightly higher level than in the corresponding week in any previous year. But the increase during the week ending July 25 was largely due to non-paralytic cases. So far in no part of the country is there a focus of undue size, and it would be premature to forecast this year's incidence. A further seasonal rise is to be expected throughout August.

Infectious Diseases

During the week ending July 18 there were fewer notifications of most infectious diseases in England and Wales. Scarlet fever notifications fell by 54 from 1,072 to 1,018; whooping-cough by 189 from 4,407 to 4,218; measles by 709 from 5,504 to 4,795; and dysentery 145 from 525 to 380.

The largest returns of dysentery were Bedfordshire 31 (Luton M.B. 19); Lancashire 57 (Liverpool C.B. 19, Preston C.B. 11, and Warrington R.D. 15); Middlesex 34 (Tottenham M.B. 12); Surrey 31 (Barnes M.B. 13); and Yorkshire West Riding 34.

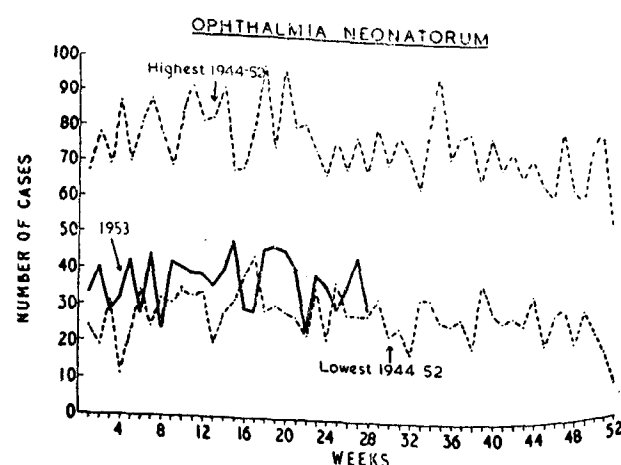
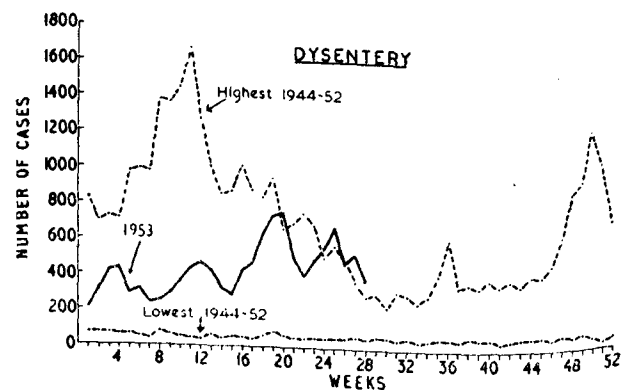
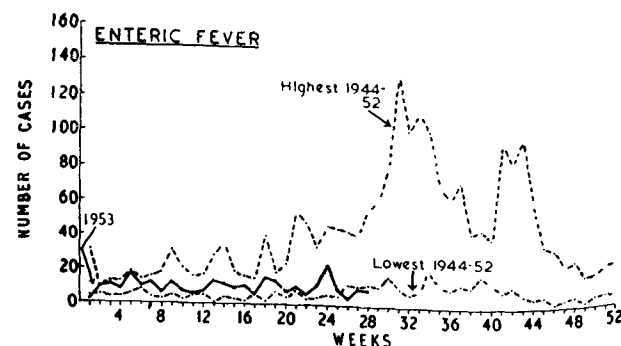
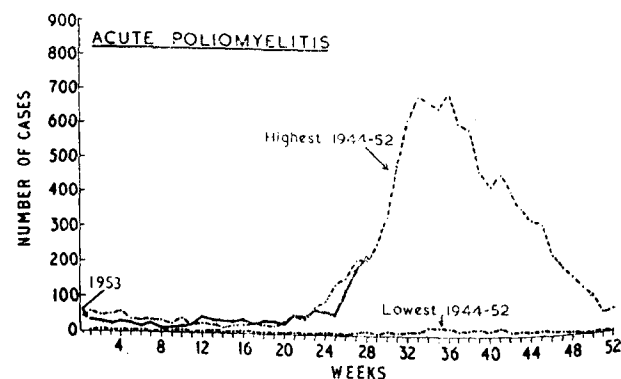
There were 284 cases of food-poisoning notified from Flintshire (Prestatyn U.D.).

Week Ending July 25

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,037, whooping-cough 4,357, diphtheria 17, measles 4,394, dysentery 309, paratyphoid fever 11, typhoid fever 2, and food-poisoning 516.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending July 18 (No. 28) and corresponding week 1952.

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

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

CASES In Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	18	3	2	0	1	33	2	9	1	3
Dysentery ..	380	45	67	5	1	151	28	75	7	2
Encephalitis, acute..	9	2	0	0		3	0	1	0	
Enteric fever: Typhoid ..	4	1	3	0		3	0	2	1	
Paratyphoid ..	5	1	0	0	1(B)	25	0	2(B)	0	
Food-poisoning ..	647	113		2		144	8			0
Infective enteritis or diarrhoea under 2 years ..				10	37				15	29
Measles*	4,795	107	117	166	141	7,541	791	105	251	248
Meningococcal infection ..	24	1	17	1	1	24	2	14	1	
Ophthalmia neonatorum ..	31	5	2	0		30	7	8	0	
Pneumonia†	286	5	98	3		329	16	147	0	
Poliomyelitis, acute: Paralytic ..	147	17		3	25	78	7		6	4
Non-paralytic ..	76	10				41	1			
Puerperal fever ..	192	22	3	0	1	276	49	16	1	2
Scarlet fever‡	1,081	64	118	23	41	1,038	93	182	14	50
Tuberculosis: Respiratory ..			133	30				111	32	
Non-respiratory..			23	6				37	12	
Whooping-cough ..	4,218	384	350	58	105	2,242	105	127	56	91

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		2	1		0	
Encephalitis, acute..		0			0	1				1
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	13	1	1	1	0	5		1	1	1
Influenza ..	4	2	0	0	0	5	3		0	0
Measles ..		0	0	0	0		0		0	0
Meningococcal infection ..		0	0				0			
Pneumonia ..	103	15	13	7	2	119	18		8	7
Poliomyelitis, acute	7	1			0	4	2			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis: Respiratory ..	86	10	16	1	2	98	13	8	3	6
Non-respiratory..		0	1	0	2		3	4	0	1
Whooping-cough ..	2	0	1	1	0	2	0		0	0
Deaths 0-1 year ..	213	17	18	7	4	200	18	28	7	10
Deaths (excluding stillbirths) ..	4,040	533	504	92	116	4,192	607	467	99	144
LIVE BIRTHS ..	7,751	1166	852	196	387	7,737	1217	902	192	403
STILLBIRTHS ..	177	15	25			174	16	24		

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

Medical News

Lunacy in Britain.—At the end of last year there were nearly 150,000 patients in mental institutions in England and Wales, according to notifications received by the Board of Control. The great majority were Health Service patients, but the total includes 5,000 private and 1,000 Broadmoor patients. For the last four years the number of patients in mental hospitals has been increasing at an average rate of over 1,000 a year. In their annual report to the Lord Chancellor the Board of Control stresses the serious overcrowding in the mental hospitals: according to the prescribed standards there were 17,500 more patients in these hospitals than they were designed to take. Equally serious is the shortage of nurses, as this has meant that many wards have had to remain closed. Nor is there much sign of improvement in the recruiting of mental nurses. The tuberculosis rate, at 6.1 cases per 1,000 resident patients, was the lowest for 13 years, and dysentery is said to have become a much less formidable illness.

Medical Research in New Zealand.—The Medical Research Council of New Zealand differs from its British counterpart in that most of its members are nominated by learned bodies, the remainder being *ex officio*. In Britain the Council (with two exceptions) elects its members itself, on the basis of their personal scientific attainments. Two years ago the New Zealand M.R.C. was reconstituted by Act of Parliament, one of the main objects being to remove its yearly financial anxiety and thus permit long-term planning, and it has now issued its first annual report (for 1952) since the change. It received a Government grant of £40,000 for the financial year 1951-2, and with this much has been achieved. In the clinical field most of the work has been concerned with the action of the hypotensive drugs; dental research has taken the form of epidemiological surveys and a physico-chemical study of caries; studies on the thyroid gland, started over 30 years ago by Sir Charles Hercus, are continuing, though now interest is centring on the role of the pituitary gland and the hypothalamus. Other fields of research activity include microbiology, neurophysiology and neuropathology, and nutrition. There is a small committee to direct research in each field.

Nuffield Medical Fellowships.—Each year the Nuffield Foundation offers a number of fellowships to medical graduates. Their aim is to fit the recipients for senior appointments in medical teaching and research in Britain. The usual annual value of each fellowship is between £900 and £1,300 (subject to income tax), and if the recipient goes abroad for study his travelling expenses are paid. Application forms and further details are obtainable from the secretary, Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1. Selection for fellowships is made once a year; and applications must be received by May 1.

Occupational Therapy at Park Prewett Hospital.—On July 29 a new occupational therapy centre at Park Prewett Hospital, Basingstoke, was opened by the Duke of Wellington. This pleasant ceremony was preceded by a lunch at which there were a number of distinguished guests, the chairman for the occasion being Mr. R. P. Chester, chairman of the Park Prewett Group Hospital Management Committee. Park Prewett is a large mental hospital with nearly 1,500 beds, and in addition it provides accommodation for the well-known plastic surgery unit at Rooksdown House. The hospital has had a flourishing occupational therapy department for some time past, and the new centre, which has been cheaply provided by the adaptation of huts formerly used for war purposes, will enable many more patients to take part in some form of creative activity. A display of work done by the patients was on view at the opening of the centre, and in particular some of the sculpture in Bath stone and many of the drawings were more

than competently executed and quite out of the usual run of amateur work. One piece of sculpture by a patient has recently been bought by Lincoln Cathedral. The management committee and the medical superintendent, Dr. I. Atkin, are to be congratulated for not allowing lack of capital to deter them from adding to the assets of the hospital.

Travelling Awards.—The Medical Research Council announces the following travelling awards for the academic year 1953-4:

Rockefeller Travelling Fellowships in Medicine (tenable at centres in the U.S.A.).—Dr. J. R. Anderson, Lecturer in Pathology, University of Glasgow; Dr. D. H. L. Evans, Lecturer in Anatomy, University College, London; Dr. O. F. Hutter, Assistant Lecturer in Physiology, University College, London; Dr. R. I. McCallum, First Assistant, Nuffield Department of Industrial Health, King's College, Newcastle-upon-Tyne; Dr. J. Paul, Assistant Lecturer in Biochemistry, University of Glasgow; and Dr. G. Watkinson, Lecturer in Medicine, University of Leeds.

Eli Lilly Travelling Fellowships in Medicine (tenable at centres in the U.S.A.).—Dr. J. G. Millichap, Chief Assistant, Children's Department, St. Bartholomew's Hospital, London; and Dr. G. H. Sloane Stanley, Assistant Lecturer in Biochemistry, Institute of Psychiatry, Maudsley Hospital, London.

Alexander Pigott Wernher Memorial Travelling Fellowships in Otolaryngology.—Dr. D. R. Haynes, Department of Otolaryngology, Johannesburg General Hospital (second year award tenable at King's College Hospital, London).

French Exchange Scholarships in Medical Science (in association with the Centre National de la Recherche Scientifique).—Dr. D. Rowley, Bacterial Chemistry Department, Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London.

Applied Psychology Unit.—Dr. N. H. Mackworth has been appointed director of the Medical Research Council's Applied Psychology Research Unit at Cambridge as from October 1, 1952. He was formerly assistant director. Most of the unit's work will in future be done outside the University Department of Experimental Psychology (which is under Professor O. L. Zangwill) in accommodation acquired by the M.R.C. at 15, Chaucer Road, Cambridge.

British Standards Institution moves next week to its new quarters at 2, Park Lane, London, W.1 (Telephone No. MAYfair 9000). The move is expected to be complete by August 17.

Dr. Janet Vaughan, principal of Somerville College, Oxford, is at present the only medical member of the committee which the Chancellor of the Exchequer, Mr. R. A. Butler, has appointed to review the economic and financial problems involved in providing for old age.

COMING EVENTS

The Seventh Congress of the International Scientific Film Association will be held in London from September 18 to 27. During this time there will be meetings of the General Assembly of the Association and of the permanent committees dealing with medical, research, technical, and industrial films, and a festival of scientific films. These will take place in the Royal Festival Hall and National Film Theatre, London, S.E.1. Further particulars may be obtained from Dr. R. C. Mac Keith, Guy's Hospital, London, S.E.1.

Conference on Medical Photography.—The fourth annual conference of the Medical Group of the Institute of British Photographers will be held at Devonshire Hall, University of Leeds, from September 25 to 27. Full details and tickets can be had from Miss C. E. Campbell, Department of Medical Photography, St. James's Hospital, Leeds, 9.

The 22nd General Hospital Reunion Dinner will be held at the Stork Hotel, Liverpool, on September 26. Further particulars may be obtained from C. Cooke, 17, Greenhill Avenue, Liverpool, 18.

NEW ISSUES

Medical and Biological Illustration.—The next issue (Vol. 3, No. 2) will be available in a week's time. The contents include:

A PUBLISHER SPEAKS. Charles Macmillan.
MOUNTING: PART II. THE MOUNTANT. Sylvia Treadgold.
THE PHOTOGRAPHY OF SURGICAL INSTRUMENTS. Eric Freeborn.
THE PHOTO KERATOSCOPE. E. F. Fincham.
A HOME-MADE SOUND PROJECTOR. H. Dekking.
A METHOD OF INVESTIGATING SMALL THREE-DIMENSIONAL OBJECTS. S. Engel.
EQUIPMENT AND METHODS:
LOCAL CONTROL IN PRINT CONTRAST.
CABINET FOR LANTERN SLIDES.
A TECHNIQUE FOR RECORDING RADIATION CHANGES IN FINGER-RIDGE PATTERNS.
INTERCHANGEABLE FILTER HOLDER.
THE HASSELBLAD CAMERA.

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

Abstracts of World Medicine.—The August issue (Vol. 14, No. 2), which is now available, contains abstracts of important papers on both medical and surgical subjects drawn from the medical literature of some 20 different countries and of all five continents. In addition to clinical medicine and surgery, the subjects covered include pathology, bacteriology, pharmacology, and chemotherapy, and there are also sections dealing with public health and industrial medicine, toxicology, anaesthetics, radiology, and the history of medicine.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request.

APPOINTMENTS

HOPKINS, E. H. BEYNON, M.R.C.S., L.R.C.P., D.P.H., Medical Officer of Health for the Llanelli Division of Carmarthenshire.
SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—J. C. Barker, M.B., B.Chir., Registrar in Diseases of the Chest in the Bristol Clinical Area; J. Roger Boule, M.B., Ch.B., Surgical Registrar, Taunton and Somerset Hospital; P. A. Ritchie, M.B., B.S., M.R.C.P., Registrar in Psychiatry, Moorhaven Hospital, Ivybridge; Elsie M. Sibthorpe, M.D., M.R.C.O.G., D.Obst., R.C.O.G., Senior Registrar in Obstetrics and Gynaecology in the Bristol Clinical Area.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Purdie.—On July 25, 1953, at North Middlesex Hospital, Silver Street, Edmonton, London, N., to Erica (formerly Roberts), M.B., B.Ch., wife of Anthony W. Purdie, F.R.F.P.S., F.R.C.O.G., a daughter.
Raphael.—On July 29, 1953, at the Royal Infirmary, Sunderland, to Gwen, wife of Dr. Montague Raphael, a daughter.

DEATHS

Alderson.—On July 15, 1953, at Tunbridge Wells, Kent, Frederick Herbert Alderson, M.B., aged 85.
Briggs.—On July 12, 1953, at Premier House, Gregory Boulevard, Nottingham, John Arthur Oswald Briggs, M.D., F.R.C.S., aged 80.
Burnier.—On July 17, 1953, at Lausanne, Switzerland, Edmond Etienne Louis Burnier, M.D.
Calverley.—On July 11, 1953, at Folkestone, Kent, Joseph Ernest Goodfellow Calverley, C.M.G., M.D., aged 81.
Ellis.—On July 20, 1953, at Kimbolton, Hunts, John Weaver Ellis, M.C., M.R.C.S., L.R.C.P., aged 64.
Forrest.—On July 10, 1953, at Beira, East Africa, Hugh Forrest, M.B., Ch.B., L.D.S.R.F.P.S., of Glasgow.
Forster.—On July 19, 1953, Albert Forster, M.B., B.S., of 28, Lemington Gardens, Fenham, Newcastle-upon-Tyne.
Forsyth.—On July 21, 1953, at 7a, College Lane, Bury St. Edmunds, Suffolk, Charles Forsyth, M.B., B.S., aged 85.
Goodwin.—On July 15, 1953, at the R.N. Hospital, Haslar, Hants, Ernest St. George Sagar Goodwin, M.D., D.P.H., Surgeon Captain, R.N., retired.
Mavor.—On July 25, 1953, at Ballater, George Alexander Mavor, M.B., Ch.B., D.P.H., late of 14, Grange Road, Edinburgh.
Maxwell.—On July 22, 1953, in hospital, Leslie Blyth Maxwell, O.B.E., M.B., B.Ch., of Warren Grange, Sandy Lane, Cheam, Surrey.
Meakin.—On July 10, 1953, Leslie Meakin, B.Chir., M.R.C.S., L.R.C.P., late of Ashton Keynes, Wilts, formerly of South Croydon, Surrey.
Rutter.—On June 16, 1953, Hubert Llewellyn Rutter, M.B.E., M.D., F.R.C.S., D.P.H., of 54, Middle Park Road, Selly Oak, Birmingham, aged 85.
Scouloudi.—On July 23, 1953, Mary Scouloudi, M.B., B.S., of 29, Pembroke Gardens, London, W.
Shaw.—On July 15, 1953, at the Nottingham General Hospital, James Denis Freshwater Shaw, M.R.C.S., L.R.C.P.
Stokoe.—On July 11, 1953, at his home, 10, Belmont Road, Scarborough, Yorks, John Stokoe, M.D., B.Hy., D.P.H., aged 51.
Tetley.—On July 17, 1953, at Hobground, Great Barugh, Malton, Yorkshire, Thomas Walsh Tetley, M.R.C.S., L.R.C.P., aged 79.
Vassallo.—On July 23, 1953, at 150, Great Tattenhams, Epsom, Surrey, Saviour Michael Vassallo, M.D., F.R.C.S.Ed., D.T.M.&H., late Senior Surgical Specialist, E. Africa, Lieutenant-Colonel R.A.M.C., Chairman Medical Board M.N.I., aged 62.
Vilvandre.—On July 26, 1953, at The Thatched Cottage, Redbourn, Herts, George Ernest Vilvandre, M.R.C.S., L.R.C.P., F.F.R.
White.—On July 7, 1953, at St. Thomas's Hospital, London, S.E., Henry Dennis White, M.R.C.S., L.R.C.P., of Wargrave, Berks, and Lynton, Devon, aged 32.

Any Questions?

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

Sweet Taste in Diabetic's Mouth

Q.—A diabetic patient complains of a very sweet taste in his mouth which puts him off his food. What treatment is advised?

A.—This symptom is not uncommon in diabetics, but in my experience it is very difficult to treat, as it seems to bear little or no relationship to the degree of control of the diabetes. Nevertheless, I think this is important, and the first step should be to obtain good control of the sugar level and the complete absence of ketosis. These patients are often introspective, but reassurance seems to be of little value. My own practice is to advise the use of chewing-gum, the flavour of which seems to mask the sweet taste; if the gum is used for a reasonable length of time the taste often fails to return when the gum is discontinued. It is, of course, advisable to exclude dental sepsis, but I presume that this has already been done.

Besnier's Prurigo

Q.—What treatment is advised for an 18-month-old infant with severe and intractable Besnier's prurigo, present since the age of 3 months?

A.—It is assumed that the problem is that of the severe asthma-eczema-prurigo syndrome and not a mere flexural persistence of infantile eczema. The problem in general has been dealt with in a reply to an earlier question (September 6, 1952, p. 573). In this particular instance it is desirable to know more about the child, the parents and family, and the immediate environment, including psychological factors, which are the most important.

It may be assumed that there is an inborn functional, if not structural, variation from the normal, and that teething is likely to be an immediate provocative cause. Such infants readily harbour infection and even in early life acquire specific allergic sensitivities which must be investigated and dealt with. The latter are treated by removing allergens rather than desensitization, though resort to non-specific desensitization may be necessary.

The parent-child relationships, which are usually of prime importance in these cases, demand careful study, and the parents will need guidance. Ideally, treatment would include complete removal from the emotionally strained environment of the home to an indifferent atmosphere, but this is rarely practicable or desired. Nevertheless the parents must have some insight into this aspect of the problem for the benefit of the infant.

Otherwise treatment is symptomatic and empirical, including small doses of sedatives to quieten the child, relieve irritation, and favour rest. The writer does not approve of the antihistamines for this purpose. Locally, crude-tar pastes, gentian violet applications, and unsaturated fatty-acid creams help. Soap and water aggravate the eczema. Antihistamine and local anaesthetic creams should be avoided. Many subjects are xerodermatous, and vitamin A in large dosage helps—100,000 i.u. daily. Vitamin B and especially liver extract may be used with benefit. It would seem unwise to employ A.C.T.H. or cortisone at this age, since it is of only temporary value. Similarly x-ray therapy should not be given. In milder cases the condition may clear, though much depends on management and the environmental circumstances. In a few patients the affection persists.

Premenstrual Mastalgia

Q.—An unmarried girl of 19 has painful enlarged breasts for about a week before her period is due. When examined at this time her breasts are very much enlarged, with engorged lobules and a slight discharge from the nipples. She complains of pain in the sub-clavicular region due to the weight of the breasts, which necessitates a larger brassière. On taking stilboestrol, 0.5 mg. three times a day for five days mid-menstrually, she gained some relief from pain and a diminution in size of the breasts was noticed, but her menstrual cycle was prolonged to 35 days. What treatment is advised?

A.—Premenstrual mastalgia in a minor degree is so common that it can be regarded as normal. In its more severe form, as in the case in question, it is often part of a premenstrual tension state in which a background of over-anxiety may be important. The first line of treatment should be to restrict the intake of fluids to not more than 30 ounces (850 ml.) in 24 hours for two weeks premenstrually, and at the same time the patient should avoid salt as far as possible. Sodium retention is also discouraged by giving ammonium chloride, gr. 10 (0.65 g.), in capsules three times daily. This, together with reassurance and a well-fitting brassière, may be enough. Hormone therapy is not very satisfactory. Oestrogens may reduce the discomfort, but, as the inquirer has found, at the cost of disturbing the menstrual cycle. Androgens are preferable, but involve some risk of producing masculinizing effects even though the dosage is small. If any form of hormone treatment becomes necessary, ethisterone, 5 mg. sublingually three times daily for 7 to 10 days before each period, should be tried first. It is unlikely to have any undesirable side-effects and sometimes appears to be helpful.

Streptothrix Organisms in the Vagina

Q.—What is the significance of the recovery of organisms of the streptothrix group from the vagina in a case of leucorrhoea? The patient is due to be married shortly. Is any treatment recommended?

A.—This finding is of little significance in itself—especially if the particular organism has not been cultured and identified. Many organisms of the streptothrix group are non-pathogenic. In any case, the presence of organisms of any kind in the vagina means little unless the discharge contains an appreciable number of pus cells. Only if the discharge is purulent can it be assumed that an infection requiring treatment is present.

Effect of Poor Soil and High Altitude on Vitamin Content of Cereals and Vegetables

Q.—To what extent do a poor soil and high altitude (over 12,000 ft.—3,600 m.) affect the vitamin content of vegetable and cereal crops?

A.—Most experiments on the effect of the state of the soil on the nutritive value of plants have indicated that poor soil depresses the quantity of crops rather than their vitamin content. It has been found, however, that the carotene content of grasses is greatest in young, rapidly growing plants. The vitamin C content of potatoes, moreover, increases as the plants reach maturity, and therefore depends upon factors, such as the state of the soil and the geographical latitude, which affect the rate of maturing. Any conditions which make grass parched and brown, or which retard the maturing of potatoes, might therefore be expected to lower their vitamin content.

As yet there is no evidence to show that an altitude of 12,000 ft. (3,600 m.) affects crops directly, although associated drought, poor soil, or rapid changes in temperature certainly hinder growth.

Tinned Orange Juice

Q.—How does the vitamin content of orange juice from tins compare with that of fresh oranges? Is it reduced by the canning processes?

A.—Orange juice is mainly valuable as a rich source of vitamin C. Although this vitamin tends to be unstable to heating and storage, any competent manufacturer can adopt precautions during the canning of the juice which will ensure the preservation of almost all of its original contents of vitamin C. A statement of the vitamin C contents on the label of the can makes the manufacturer legally responsible for his product containing the amount indicated. Glass containers would appear to offer no advantages over cans, except possibly when the juice has to be stored for unusually long periods.

Desquamation of the Soles

Q.—What is the cause of recurrent irritation followed by superficial desquamation of the soles of the feet, especially over the metatarsal heads? The condition first developed in a healthy boy of 8 years towards the end of the summer, after wearing sandals without socks for a few months, but has recurred after wearing socks and boots for several months. The skin appears normal until desquamation occurs, but the preceding irritation—which lasts several weeks—is most tiresome. The skin between the toes appears normal.

A.—The possible internal causes of the attacks of irritation and desquamation described are an allergy to drugs, a focus of sepsis, or emotional and nervous causes. In the latter case an accompanying hyperhidrosis would be probable. The pompholyx of nervous origin is closely allied. Local causes would include possible sensitization to rubber soles or some other element of the footwear, and—less likely from the history—fungal infection.

Whisky Rash

Q.—I gave a patient some injections of penicillin and then the patient took some whisky (after the fourth daily injection). Within a few hours the patient developed an urticarial rash, which in the course of a day or so spread all over his body. He felt very ill and ran a temperature of 101 to 102° F. (38.3 to 38.9° C.) for a few days. Treatment cleared up the trouble after four or five anxious days. Now this patient finds that every time he has a drink of whisky he breaks out in an urticarial rash. He is very anxious to know if he will always have this trouble, as he is very fond of his drink.

A.—There is unfortunately no indication of the time that has elapsed since the development of the first rash and the subsequent attempts at drinking whisky. It is, however, highly unlikely that the patient has developed a sensitivity to whisky. The probable explanation is that the whisky acts as a peripheral vasodilator and causes a reappearance of the rash, which has not completely subsided. Should the unfortunate patient still be experiencing this difficulty he should try taking 50 mg. diphenhydramine hydrochloride ("benadryl") about half an hour before taking a drink, and if this is not sufficient the dose could be increased till the symptoms are suppressed.

Calcified Veins and X Rays

Q.—Is there any known relationship between exposure to x rays and calcification of veins? A man aged 66, employed as a radiographer, has been complaining of pain, heaviness, and weakness in his legs. A radiograph has disclosed calcification in the veins of the thigh. What is likely to be the cause?

A.—There is no known relationship between x rays and venous calcification. It is, in fact, a rare condition, unlike arterial calcification, which must not be confused with it. Old thrombosis, particularly that caused by sclerosing injections for varicose veins, is the commonest cause. If this

is excluded general metabolic diseases such as hyperparathyroidism, in which renal lithiasis, osteoporosis, and hypercalcaemia occur, must be sought. Unless a specific cause is found the treatment is symptomatic—by the use of oral analgesics and a supporting bandage.

Chloroform and Trichlorethylene

Q.—Is there any truth in the belief that the use of chloroform after trichlorethylene analgesia during labour is specially dangerous?

A.—There is little published work to indicate whether the previous administration of trichlorethylene increases the dangers of chloroform anaesthesia. The extra danger involved is probably small compared with the already considerable one of the chloroform itself.

NOTES AND COMMENTS

Holiday T.A.B.—Mr. ANDREW HICKS (Nairobi) writes: I was in a somewhat similar position to your questioner ("Any Questions?" June 6, p. 1289) last year before coming out here with two children aged 11 months and 4 years. Inquiries among my colleagues, clinicians and pathologists, revealed a general consensus of opinion similar to your expert's. However, within a few months of arrival I came across a case of paratyphoid B in an infant of 11 months, and practitioners out here say that such a happening is by no means a rarity. I would suggest that the later months of the first year of life are a dangerous time from this point of view, as the child is crawling and walking, is widening the scope of his diet, and popping all sorts of interesting things into his mouth. Might not an upper limit of six months be safer than twelve? The position is simplified here, there being available a specially diluted alcoholic vaccine for young children, which has produced very little local or general reaction in my experience.

OUR EXPERT writes: Acute gastro-intestinal infection (food-poisoning) with the Salmonella group of organisms can certainly occur, and is sometimes severe in infants. I suspect that the paratyphoid infections that occur at this age mostly fall into this category, and it is doubtful if prophylactic vaccination will give much protection against this kind of infection. But I agree that there is no harm in giving an infant of 6 months injections of a suitably diluted vaccine.

Midge Repellents.—Dr. J. T. INGRAM (Leeds) writes: With reference to the question on this subject ("Any Questions?" July 18, p. 162), some patients are protected against midges by taking ephedrine, $\frac{1}{4}$ gr. (16 mg.), once or twice a day. An old-fashioned repellent, used as local application, is cod-liver oil. It can be effectively dispensed in a non-greasy base with phenol and oil of citronella to mask the smell.

Corrections

In our report of the meeting of the Section of Anaesthetics (July 25, p. 216) the name of the speaker who gave an account of 500 cases of hypotension should have been given as Dr. W. N. ROLLASON, of Hull.

The diplomas of Surgeon Rear-Admiral T. N. D'Arcy, C.B., C.B.E., should have read L.R.C.P.&S.I., and not L.R.C.P.&S.Ed., as stated in the list of promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem (*Journal*, July 18, p. 146).

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INSULIN AS A GROWTH HORMONE

BY

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[WITH SPECIAL PLATE]

The effect of insulin on the growth of animals deprived of the pituitary gland has not previously been reported.* The well-known obstacle has been the great sensitivity of the hypophysectomized animal to the antidiabetic hormone. Using slow-acting insulin in gradually increasing amounts and a high carbohydrate diet attractive to the animal and constantly available, we have been able to stimulate rapid growth in completely hypophysectomized rats. These animals exhibit an increase in all the main body constituents and a very definite augmentation of skeletal growth. The methods used, the details of the results, and their potential significance in physiology and medicine will be presented and briefly discussed.

Methods

The hypophysectomized rats were secured from the Hormone Assay Company. Completeness of the operation was confirmed at necropsy and no anterior pituitary tissue has thus far been found. One daily injection of protamine zinc insulin (Toronto), 40 units per ml., has been administered subcutaneously. The first lot may have contained a little hyperglycaemic factor, but this material could not be detected in subsequent ones. The composition of the diet was as follows: commercial dog food containing horse meat 892 g., white bread crumbs 345 g., whole wheat flour 396 g., glucose 80 g., and 1 quart of whole milk.

Animals in all groups ate the same diet *ad libitum*. The food intake and the weight of each rat were measured

*Preliminary notes on this work have appeared (Salter and Best, 1952, 1953).

daily. Organs were removed at necropsy, weighed, and returned to the carcass, which, minus the contents of the gastro-intestinal tract, was finely minced and then homogenized in a blender. Representative aliquots were thus available for the determinations of protein, fat, and water, which were carried out by standard and regularly checked methods. The tibia test of Greenspan *et al.* (1949) was performed to evaluate skeletal growth. In our second experiment two tibiae were removed from each carcass. One was placed in neutral formalin for the above-mentioned test, and the second was fixed in formol calcium. Paraffin sections were prepared and stained with H. and E. and Mallory's connective-tissue stains.

Experimental Procedures and Results

Anticipating hypoglycaemia at many points in the 24 hours, a "pilot" experiment using two rats was performed. It was found that small amounts of protamine zinc insulin were well tolerated by the hypophysectomized animals, and that when a suitable diet was made available at all times constant attention became unnecessary. Before this goal was reached in this experiment one animal succumbed to hypoglycaemia, but the other grew rapidly, nearly doubling its weight in 20 days, and it served as a model for the many larger series of animals which have subsequently been studied. In this rat it was found that the tail had lengthened by 1 cm. during the 20 days of insulin therapy. At necropsy the thymus, kidney, and heart weights were within the normal range. The liver was heavier than normal. The testes, adrenals, and thyroid were atrophic.

Experiment A.—In this experiment 40 male rats, 14 days after hypophysectomy, were divided into three groups of

TABLE I.—Organ Weights of Hypophysectomized Rats

	No. in Group	Adrenals		Testes		Thymus		Kidney		Heart		Liver	
		Weight (mg.)	% Body Weight	Weight (g.)	% Body Weight	Weight (g.)	% Body Weight	Weight (g.)	% Body Weight	Weight (g.)	% Body Weight	Weight (g.)	% Body Weight
Hypophysectomized controls killed at start of experiment	10	12.6	0.011	0.53	0.47	0.235	0.206	0.72	0.63	0.34	0.30	3.61	3.16
Hypophysectomized controls; no treatment 16 days	11	12.6	0.011	0.34	0.29	0.303	0.263	0.71	0.62	0.36	0.31	3.79	3.29
Hypophysectomized rats receiving protamine zinc insulin 15 days	8	14.2	0.009	0.31	0.20	0.42	0.27	0.87	0.57	0.44	0.29	7.45	4.87

TABLE II.—Carcass Composition of Hypophysectomized Rats

Treatment	No. in Group	Average % Composition			Average Absolute Weight			Average in g.		Average Width (μ) of Epiphyseal Cartilage
		Water	Fat	Protamine	Water	Fat	Protamine	Terminal Body Weight	Weight Change	
Hypophysectomized control killed at start of experiment ..	10	67.4	10.6	20.4	76.8	12.1	23.2	114		
Hypophysectomized controls; no treatment 16 days ..	11	65.4	13.3	19.2	75.2	15.3	22.1	115	+4	114
Hypophysectomized rats receiving protamine zinc insulin 15 days ..	8	64.1	16.8	17.5	98.1	27.5	26.8	153	+41	186

10, 18, and 12. The 10 animals were sacrificed on the initial day to secure basal values. Each member of the second group received daily for 15 days a dose of protamine zinc insulin, which was increased whenever the previous dose failed to produce a definite increase in weight. The 12 animals in group 3 received no insulin and were sacrificed at the same time as those in group 2. The analytical results secured on the surviving animals are given in Tables I and II, and the growth curves are plotted in Fig. 1.

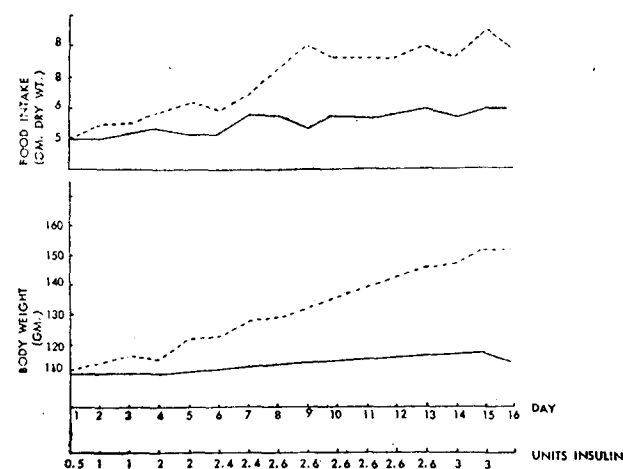


FIG. 1.—Weight changes and food intake of hypophysectomized rats. —, controls. ----, receiving protamine zinc insulin.

In Table I the figures demonstrate that insulin has produced an absolute increase in the weights of thymus, kidney, heart, and liver. In Table II the figures show that the gain in weight of the insulin-treated animals was due to an absolute increase in the main body constituents. The results of the tibia test showed that very definite skeletal growth had occurred. Total body fat increased to a greater extent than protein and water. There was, however, a definite increase in protein. There appears to be a slight reduction in total protein in the control animals, but this may not be significant. The curves in Fig. 1 are self-explanatory.

Experiment B.—In this experiment 40 male rats, 14 days after hypophysectomy, were divided into groups of 20, 10, and 10. Each rat in group 1 received, as in Experiment A, one daily dose of protamine zinc insulin. Each rat in group 2 received a daily subcutaneous dose of growth hormone, which was regulated to produce approximately the same rate of growth as exhibited by the insulin-treated animals. Group 3 served as a control and received the same diet *ad libitum* as the other two groups. All the animals were sacrificed on the 15th day of the experiment. The analytical findings in the surviving animals are presented in Tables III and IV and the growth curves in Fig. 2.

*Maximal amounts of growth hormone were not administered. Somewhat larger doses of insulin might also have been given. In this experiment the weight gains of the two groups were matched by design.

The findings confirm those of Experiment A and indicate that under the conditions of this study the insulin-treated hypophysectomized rats stored more fat and less water than similar ones treated with G.H. The animals receiving P.Z.I. consumed more food (including protein), but their total body protein was slightly less than that of the animals treated with G.H. The insulin-treated rats retained a smaller proportion of the ingested nitrogen. The average weight gain and final weight were the same in both experimental groups.* Insulin appeared to produce a greater gain in weight of kidneys, heart, liver, and thymus. Neither hormone exerted any definite effect on the adrenal, thyroid, or testes.

Experiment C.—In this experiment 53 hypophysectomized rats were divided into groups 1, 2, and 3, consisting respectively of 14 controls, 14 treated with growth hormone, and 25 treated with protamine zinc insulin. The procedure followed was identical with that described in Experiment B. During the experimental period 8 of the insulin-treated animals died. All rats in groups 1 and 2 survived. The increase in weight of both insulin- and growth-hormone-treated animals was 42 g. in the 15 days. The dosage of both materials was approximately the same as in Experiment B (see Fig. 2). The gain in protein was 2.6 g. per animal in the insulin-treated and 4.0 in the G.H.-treated group. The increase in width of the epiphyseal disk was 75 μ in the insulin-treated group and 154 μ in the G.H.-treated. In a normal rat weighing the same as the insulin-treated animal the epiphyseal disk was approximately the same width. The growth hormone increased the width of the disk to almost twice that of a normal intact control rat of the same weight. Fig. 3 (Special Plate) shows sections of the epiphyseal disks of treated and untreated hypophysectomized rats.

JAMES SALTER AND CHARLES H. BEST: LEGENDS TO PLATE

FIG. 3A represents a section of the epiphyseal disk of a hypophysectomized control rat. All zones of the epiphyseal disk are very narrow. The trabecular bone is very coarse and the bone marrow is very fatty in both epiphysis and metaphysis. This section illustrates the characteristic effects of hypophysectomy on the tibia of a young rat.

FIG. 3B shows the stimulating effect of insulin administration on the skeletal growth of hypophysectomized rats. Professor W. S. Hartroft chose as a representative disk one which was roughly twice as wide as the disks of untreated hypophysectomized rats. The histological picture approximates that of a normal intact rat of the same weight (see Fig. C). The organization of both the epiphyseal and metaphyseal bones is coarse and irregular, with pronounced growth lines indicated by irregular waves and bands. The marrow of the epiphysis and metaphysis is less fatty than that of the control animals.

FIG. 3C is a representative photomicrograph made through the epiphyseal disk of a normal intact male rat weighing the same as the average weight of the insulin-treated hypophysectomized animals (143 g.). The organization and arrangement within the disk are very orderly and no irregularities are apparent.



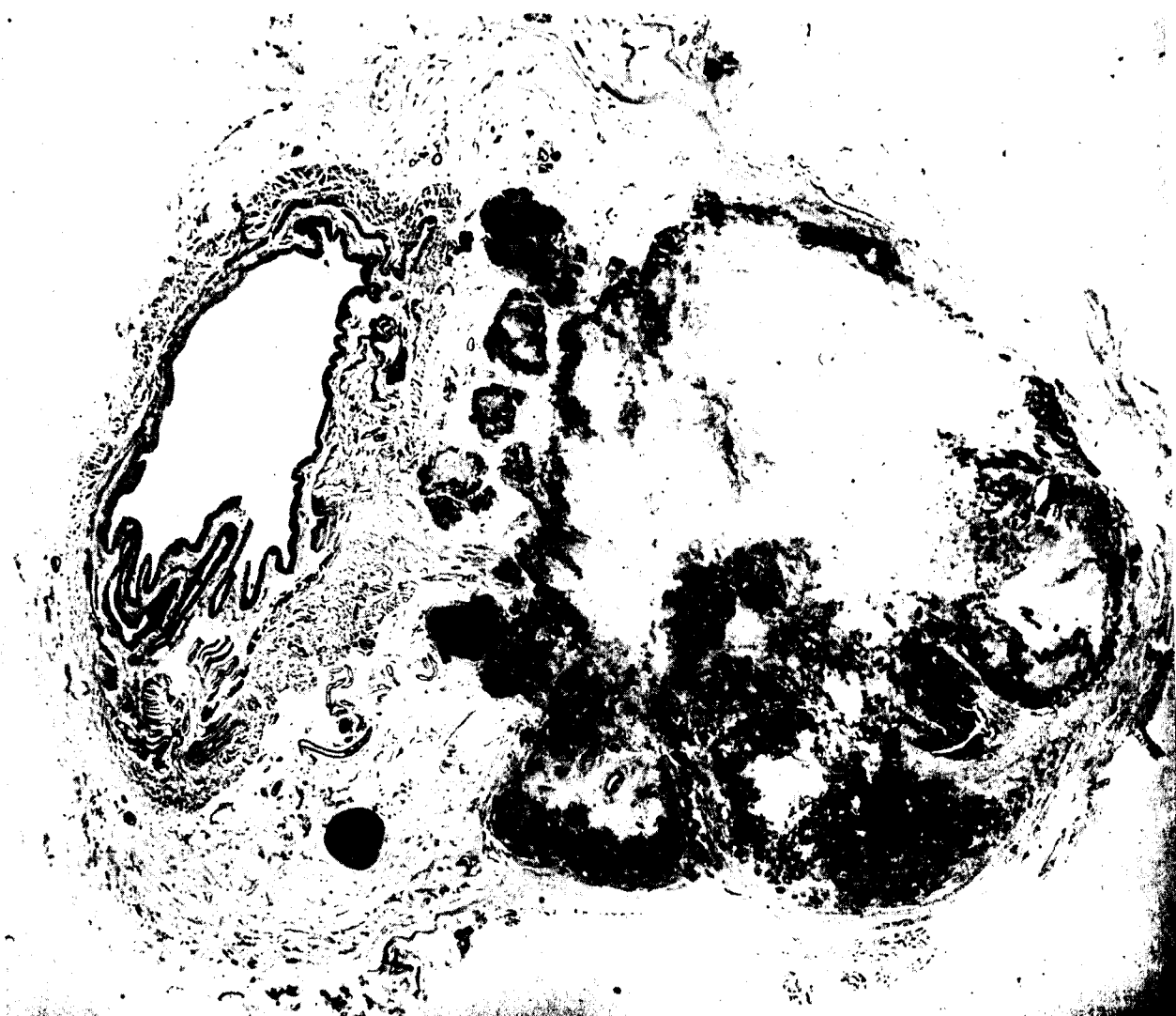
L. M. FRANKS: STRUCTURAL CHANGES IN PROSTATIC CANCER AFTER
BILATERAL ADRENALECTOMY

FIG. 1.—Prostate and rectum (×2). A dark peripheral zone of growth surrounds a large pale central area of massive necrosis. There is a similar change in tumour deposits in lymph nodes and periprostic tissues included in the section.

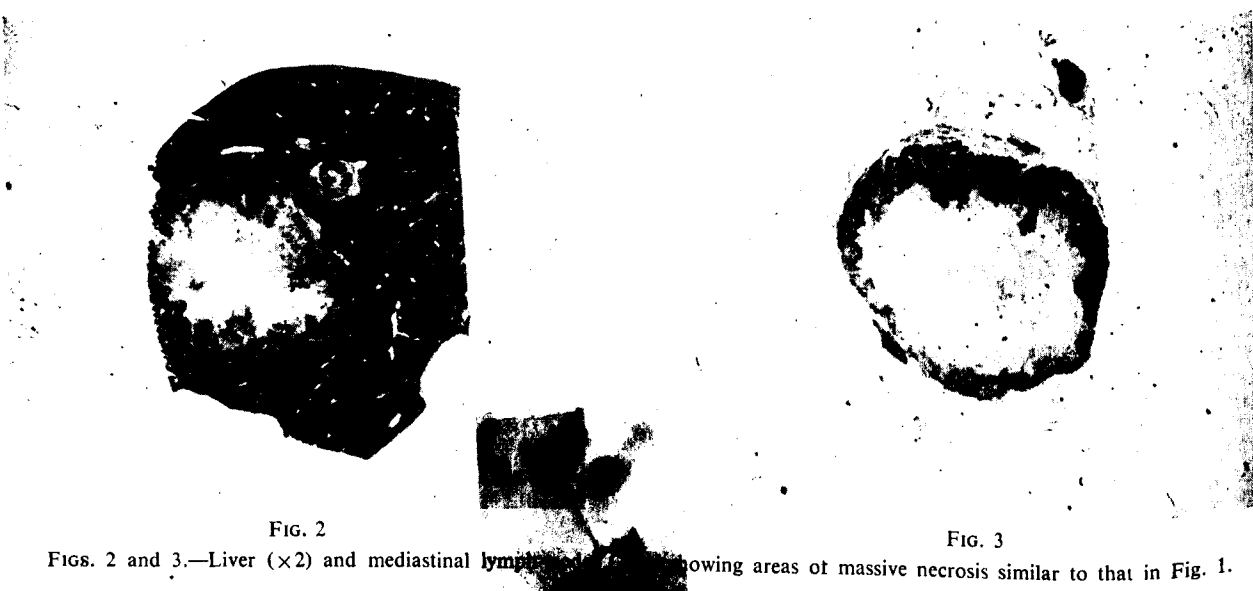


FIG. 2

FIG. 3

FIGS. 2 and 3.—Liver (×2) and mediastinal lymph nodes showing areas of massive necrosis similar to that in Fig. 1.

TABLE III.—Organ Weights of Hypophysectomized Rats

	No. in Group	Adrenals		Testes		Thymus		Kidneys		Heart		Liver	
		Weight (mg.)	% Body Weight	Weight (g.)	% Body Weight	Weight (g.)	% Body Weight	Weight (g.)	% Body Weight	Weight (g.)	% Body Weight	Weight (g.)	% Body Weight
Hypophysectomized controls; no treatment 15 days	10	13.7	0.012	0.36	0.32	0.26	0.25	0.63	0.57	0.31	0.28	3.65	3.30
Hypophysectomized rats; growth hormone injected 14 days	10	15.7	0.011	0.33	0.23	0.37	0.26	0.76	0.54	0.37	0.26	4.65	3.30
Hypophysectomized rats; protamine zinc insulin injected 14 days	12	14.6	0.010	0.33	0.23	0.44	0.31	0.81	0.57	0.42	0.30	5.59	3.96

TABLE IV.—Carcass Composition of Hypophysectomized Rats

Treatment	No. in Group	Average % Composition			Average Absolute Weight			Average (g.)		Average Width (μ) of Epiphysal Cartilage
		Water	Fat	Protamine	Water	Fat	Protamine	Terminal Body Weight	Weight Change	
Hypophysectomized controls; no treatment 15 days	10	64.7	14.0	20.0	71.8	15.5	22.2	111	+4	120
Hypophysectomized rats; growth hormone injected 15 days	10	67.3	13.6	18.6	94.9	19.3	26.2	141	+34	275
Hypophysectomized rats; protamine zinc insulin injected 15 days	12	65.0	15.7	17.6	91.6	22.1	24.8	141	+33	196

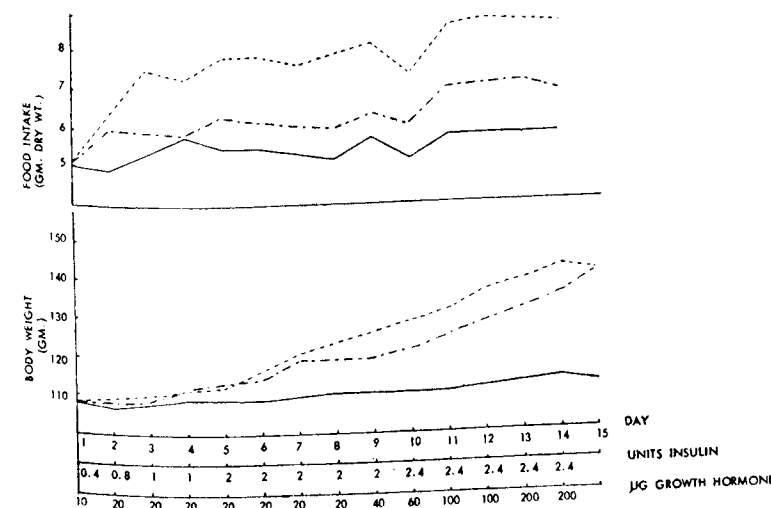


FIG. 2.—Weight changes and food intake of hypophysectomized rats. —, controls. ---, receiving growth hormone. ·····, receiving protamine zinc insulin.

Discussion

It is well established that insulin plays an important part in anabolic processes, and that it reverses the series of catabolic reactions which are collectively known as diabetes mellitus. Insulin causes resumption of growth in the depancreatized animal. It increases the rate of formation of glycogen and fat and of the incorporation of amino-acids into proteins. The only catabolic effect of physiological amounts is to increase the combustion of sugar. Under physiological conditions insulin works synergistically with the somatotrophic factor of the anterior pituitary and with other hormones which in the complete absence of insulin exert predominantly catabolic effects.

When the pituitary gland is removed growth may be prevented (Allen, 1916; Evans and Long, 1921). The animals remain at approximately the same weight level. The growth rate is zero. But in many species when the source of insulin is completely removed there is a rapid loss in weight. The growth rate is negative. Removal of the pituitary from these depancreatized animals may restore the growth rate to zero.

The hypophysectomized animal may develop fatal hypoglycaemia during even a short period of fasting, without receiving any exogenous insulin, and this is probably the

principal reason why experiments such as we are reporting have not previously been carried out. We have used only one daily dose of P.Z.I. It is quite probable that a more continuous insulin therapy might reveal even more dramatic effects of insulin upon the growth of hypophysectomized animals.

The well-established anabolic effects of somatotropin in the normal or hypophysectomized animal do not require comment here. The protein retention and skeletal growth are both much greater than that which we have produced with insulin alone. In the somatotropin-treated series both insulin and the pituitary growth hormone were available. Somatotropin without insulin produces no nitrogen retention or skeletal growth (Milman *et al.*, 1951). Our experiments provide no further evidence on this latter point or on the debatable question of the liberation of insulin from the islets by the indirect or direct action of somatotropin.

It is remotely possible that somatotropin, which produces a large increase in the volume of the pancreatic islets, causes a more effective liberation of insulin than we have accomplished with one daily dose of P.Z.I., but there is no direct evidence as yet that somatotropin causes any liberation of insulin.

It has been reported that somatotropin may cause liberation of glucagon, the pancreatic hyperglycaemic factor (Bornstein *et al.*, 1951), and, recently, that glucagon may stimulate growth, as evidenced by widening of the epiphysal disks of hypophysectomized rats (Elrick, 1953). In these latter experiments the most potent preparation of glucagon did not produce a convincing widening of the epiphysal disks. Convulsions, relieved by sugar, were frequently a late result of the injection of other preparations. These could have been produced by some residual insulin or perhaps, as suggested by the author, by the reaction of the beta cells to the hyperglycaemia. In an extension of findings by earlier investigators, Dr. O. Sirek, in our laboratory, has demonstrated that a purified growth preparation may produce no hyperglycaemia in a normal dog but a large further increase in blood sugar in the same dog after pancreatectomy. The blood-sugar changes that occur under these conditions suggest that during a period of growth-hormone administration the hypoglycaemic factor may be

liberated from the pancreas in more effective amounts than is the hyperglycaemic principle.

The clinical significance of this experimental demonstration—that is, the production of rapid growth in the "pituitary" dwarf animal by giving insulin—merits consideration. Is a failure of insulin liberation one of the many factors which may limit growth in the human pituitary dwarf? Removal of the pituitary in animals does not cause atrophy of the islands of Langerhans, but it prevents their growth and presumably the augmented liberation of insulin which this normal growth would require and elicit. It may be argued that any factor or factors which produce general body growth will cause growth of islet tissue. This is probably true under most circumstances (Haist, 1953). It would not be expected in this present study, since the excess of insulin would lessen the need for islet activity, reduce the granule count of the beta cells, and lower the insulin content of the pancreas.

Some human "pituitary" dwarfs are very sensitive to insulin; others are not. The evidence implicating the pituitary at all is frequently most unconvincing. Our findings show that in one species the presence of low blood-sugar values and great sensitivity to insulin do not eliminate administration of insulin as one means of producing a dramatic growth effect. To what extent the hypoglycaemic effect of insulin may be modified by other hormones without interfering with its growth effect is being investigated both experimentally and clinically.* A more fundamental clinical question is whether or not a failure of growth ever occurs, apart from the frank diabetic state, in which the limiting factor is the ability of the beta cells to produce and liberate insulin. Our findings *do not* show that exogenous insulin is necessary for growth of hypophysectomized rats. Somatotropin, when endogenous insulin is available, is more effective. But a clinical condition might exist in which the pancreatic beta cells, while still capable of preventing the diabetic state at the existing reduced rate of growth and demand for insulin, are one of the factors limiting normal development. Somatotropin and insulin together might produce results where one alone would be inadequate. The clinician watches for evidence of decreased function of thyroid, adrenal, and gonads in cases of suspected pituitary dwarfism. He may attempt to stimulate these glands or to provide their products. We are suggesting that, in addition, a condition may exist in which the stimulus exerted by somatotropin or by an increased food intake may prove inadequate to provide an optimum liberation of insulin from the pancreas. Would this situation always be revealed by the appearance of diabetes? Are there other procedures which may stimulate the beta cells? Will insulin administration further decrease the response of the beta cells?

Some growth studies have been made in animals with small amounts of insulin and large amounts of somatotropin available, but many other variations of dosage of these two hormones and of insulin with other hormones will certainly yield new and interesting findings. Some investigators have confused the issue by assuming, without justification, that the alloxan-diabetic animal has *no* insulin available.

With our high-carbohydrate diets the effect of insulin on fat synthesis has been conspicuous. With very high protein diets a different picture might be obtained, but the tolerance for insulin would probably be reduced. The findings in Querido's laboratory in Leyden (personal communication) indicate that the duration of feeding periods and their spacing throughout the day may affect the composition of body tissues. The time of administration and the duration of action of the various hormones might affect appetite, the pattern of food intake, and perhaps the composition of body tissues.

*Mr. Robin Lawrence and one of us (J.S.) have found that cortisone may prevent the effect of insulin on the widening of the epiphyseal disk, but the hypophysectomized animals receiving both hormones gained appreciably in weight.

As illustrated in Figs. 1 and 2, the insulin-treated hypophysectomized rats consumed more food than the controls. There is evidence that insulin-treated normal rats (Maassen, 1951) grow faster than paired-fed controls, and this is certainly clearly seen when somatotropin is the growth stimulant (Li and Evans, 1948; Young, 1952). The effect of forced feeding on the growth of hypophysectomized rats is controversial. Samuels, Reinecke, and Bauman (1943) state that force-fed hypophysectomized rats exhibit an increase in femur and body weight. Levin (1944), in repeating these experiments, reported that the increase in body weight could be totally attributed to fat deposition. It will be difficult to give much insulin to hypophysectomized rats which are not permitted to eat more than the controls. A careful comparison of force-fed and insulin-treated hypophysectomized animals with identical food intakes might provide valuable data. Great care in the interpretation of results would be necessary, since the effect of insulin, liberated physiologically by the demands of a forced food intake, might not affect growth in exactly the same way as would an identical food intake stimulated by an excess of exogenous insulin given in one or more daily doses.

Summary and Conclusions

The sensitivity to insulin of hypophysectomized animals has prevented investigation of the effects of the antidiabetic hormone on their growth. By using a slow-acting insulin in gradually increasing doses an average increase in weight of 38 g. in 15 days has been secured in completely hypophysectomized rats. The width of the epiphyseal disk of the tibia in these three experiments showed, on the average, an increase of 65%. The average increase in body protein was 2.6 g. per rat. The control hypophysectomized animals which ate smaller amounts of the same diet remained essentially stationary in weight, protein content, and skeletal size. These findings therefore demonstrate that insulin may stimulate growth under these conditions and strengthen the possibility that decreased liberation of insulin may be one of the factors limiting growth in the hypophysectomized animal. The physiological and clinical significance of these findings has been briefly discussed.

We are indebted to Professor W. Stanley Hartroft for his interest and help. This work has been supported by a grant from the Canadian Life Insurance Officers' Association.

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The Council of the Yugoslav Academies has commenced publication of a quarterly *Scientific Bulletin* in English, French, and German, the chief purpose of which is to give information on scientific activities in that country. Most scientific work in Yugoslavia appears only in periodicals published in the Croatian or Serbian languages, which makes it difficult for those abroad to become acquainted with current research work. For this reason alone the *Bulletin* should prove of considerable interest. It is edited by Dr. A. Peterlin, Institut de Physique J. Stephan, Ljubljana, Yugoslavia.

THE INSULIN-LIKE ACTION OF GROWTH HORMONE*

BY

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It has been reported that pituitary growth hormone affects the rate of glucose uptake by isolated rat diaphragm (Ottaway, 1951). Two types of effect were observed. When the diaphragm was given a preliminary soaking for 20 minutes in a growth-hormone solution without glucose, and then incubated in a second solution containing glucose but no growth hormone, the glucose uptake was found to be increased. When the diaphragm was incubated straightforwardly in one solution growth hormone depressed the glucose uptake. The concentration of growth hormone in both types of experiment was 100 μ g. per ml.

The effect of growth hormone *in vitro* in a straightforward incubation of rat diaphragm has now been investigated further. The inhibitory effect of growth hormone at a concentration of 100 μ g. per ml. was confirmed, but at lower concentrations, especially at 1–5 μ g. per ml., the results were conflicting. Some series of experiments showed an inhibition, and others an activation. The mean of all the observed glucose uptakes with growth hormone present at concentrations of 5 μ g. per ml. or below did not differ from the mean control uptake, but the variance was significantly greater than that of the controls. It was felt that the growth hormone could indeed produce two quite different effects, but their induction depended on unidentified changes in experimental conditions.

The elucidation of these changes proved difficult because of the wide scatter of the control rates of uptake, and it was first necessary to find some means of making the muscle metabolize more consistently. Perlmutter *et al.* (1952) and Park *et al.* (1952) have both recently drawn attention to this problem of variance in work with rat diaphragm, and Krahle (1951) has evolved a technique which greatly reduces the variance of the control glucose uptake. The diaphragm is allowed to remain, after excision from the rat, for 5 to 15 minutes in ice-cold bicarbonate buffer. The glucose uptake subsequently is found to be at a higher rate than usual, but there is much less variation between pieces of muscle from one diaphragm. This method, which has apparently been in use for some years in Krahle's laboratory, has been tried by us and its effectiveness confirmed. Unfortunately, as Krahle himself found, after this treatment the diaphragm of the normal unoperated rat is quite insensitive to growth hormone added *in vitro*.

Experimental Technique

Another technique, described below, has been developed in this laboratory. Hitherto experiments on rat diaphragm have been carried out by a single operator, using four pieces of muscle from one diaphragm; in these circumstances it is inevitable that one hemi-diaphragm will be dealt with at a later time than the other. Study of results suggested that the later, or second, hemi-diaphragm often had a higher glucose uptake than the former. At first it was thought that the difference might in some way be connected with a

*The tables included in this paper have already been reported in *Biochimica et biophysica acta*, 1953, **11**, 443.

leakage of potassium from what is to some extent a damaged tissue. However, this explanation was found not to be the correct one, which agrees with the findings of Perlmutter *et al.* Another possible cause was thought to be the fact that one half of the diaphragm remained in more or less anaerobic conditions for a longer time than the other, and a technique was developed in which both hemi-diaphragms are treated in an identical way (see also Stadie *et al.*, 1949).

For the experiments reported in this paper the medium devised by Stadie and Zapp (1947) was used. It was modified by raising the proportion of dibasic sodium phosphate to bring the pH up to 7.2. This was done to ensure that the growth hormone (I.E.P. 6.75) remained in solution. The diaphragm was excised whole from a fasted male albino rat, and washed for a moment in medium to remove adhering blood. It was then placed in a Gooch crucible containing 10–15 ml. of medium with glucose; nitrogen was passed at a steady rate through the sintered glass bottom of the crucible. This precaution was taken to ensure that the muscle had the same pO_2 in all the experiments. It remained in this solution for two minutes, during which time it was divided into two along the central tendon, without removing it from the liquid. The addition of ascorbic acid (0.005M) to the medium used in this preliminary gassing was found to reduce the variation in control uptakes; its use did not affect the type of result obtained. Each hemi-diaphragm was taken simultaneously by one operator, blotted, and divided into two, and the four pieces were placed into four Warburg flasks. The flasks were being gassed in the bath (with oxygen) three and a half to four minutes after excision.

Results

The rigid use of this routine led to the finding that growth hormone stimulated the glucose uptake of normal rat diaphragm at the concentration used, which was 25 μ g. per ml. in all the experiments reported here. A stimulation was also observed at 10 μ g. per ml., but at 40 μ g. per ml. the hormone was apparently without effect. The hormone was dissolved in a small quantity of medium with the aid of a drop of N/10 NaOH, and this solution was diluted as required. The insulin-like activity disappears quite rapidly from the solution, and it is necessary to use it not more than 20 minutes after making. The results were very consistent: a stimulation was found in 26 out of 29 pairs of observations. The results are summarized in Table I.

TABLE I.—Effect of Growth Hormone on Glucose Uptake in mg./g. of Tissue/Hour of Normal Rat Diaphragm After Two Minutes in Anaerobic Conditions. Growth Hormone Added *in vitro*, Concentration 25 μ g./ml. Glucose Concentration, 2 mg./ml. Incubated for 1–2 Hours

No. of Observations	Control $\pm$ S.E.	Growth Hormone $\pm$ S.E.
30	3.44 $\pm$ 0.16	4.06 $\pm$ 0.16

Difference, +0.62 $\pm$ 0.13; $t = 2.70$, $P = 0.01$.

It seemed desirable to show whether insulin was in some way responsible for this increase in glucose uptake before postulating a new stimulating principle. It seems unlikely that, prepared by the usual methods, growth hormone itself contains insulin (see, in particular, the work of Krahle and his colleagues). There remained the possibility that insulin was in some way liberated by growth hormone after the preliminary anaerobic treatment of the diaphragm, either in the muscle cells themselves or in the blood remaining in the blood vessels of the diaphragm after excision.

The experiments were therefore repeated, using alloxan-diabetic rats. The rats were not used until at least ten days after subcutaneous injection of 25 mg. of alloxan per 100 g. of rat, after the method of Kass and Waisbren (1945). Table II shows that growth hormone had no effect on the glucose uptake from diabetic rat diaphragm—that is, from animals with a fasting blood sugar greater than 150 mg. per 100 ml.

TABLE II.—Effect of Growth Hormone on Glucose Uptake in mg./g./hr. of Diabetic Rat Diaphragm, After Two Minutes in Anaerobic Conditions. Growth Hormone Added *in vitro*, Concentration 25 µg./ml. Glucose Concentration, 2 mg./ml. Incubated for 1–2 Hours

Fasting Blood Sugar	No. of Observations	Control±S.E.	Growth Hormone±S.E.
<150 mg. per 100 ml.	11	3.50	3.59
		Difference, +0.09±0.27	
>150 " " " "	28	3.68	3.57
		Difference, -0.11±0.16	

(Significantly different from the normal difference) $t=2.65$, $P=0.01$.

This work was done before the results of Groen *et al.* (1952) became available. These workers found that it may be as long as three weeks before the last trace of insulin disappears from the blood of a diabetic animal. The present work would thus have been more conclusive if the animals had been kept for a longer time before use. However, the Chart shows that the stimulation induced by growth hormone added *in vitro* varies inversely with the fasting blood sugar: with the most severely diabetic animals there was indeed a slight inhibition of glucose uptake. This relationship between stimulation and severity of diabetes may be regarded as further evidence that it is insulin which is directly responsible for the stimulation.

As a corollary to these experiments it is desirable to show that the stimulation is increased when the concentration of insulin in the tissue is raised above normal—for example,

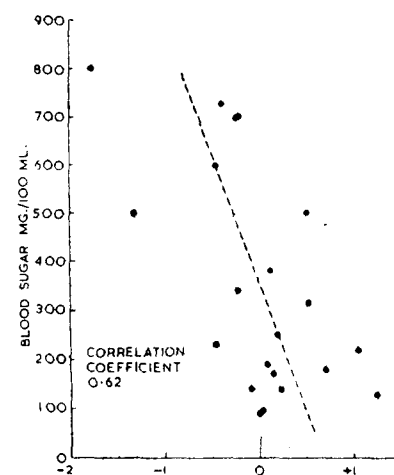


Chart showing effect of growth hormone on glucose uptake.

by injection of insulin into the intact animal. Injection of insulin into normal animals, with the consequent fall in blood-sugar concentration, might, however, have led to secretion of the anti-insulin factor, which has been shown by Somogyi (1948) to play a large part in the regulation of the blood-sugar level in human beings. A preliminary experiment showed that injection of 1–2 units of insulin subcutaneously

TABLE III.—Effect of Growth Hormone on Glucose Uptake in mg./g./hr. of Diaphragms from Fasting Diabetic Rats. The Rats had been Injected 30 Minutes Previously with 1–2 Units of Insulin. Other conditions as in Tables I and II

Mean Fasting Blood	Mean Blood Sugar at Death	No. of Observations	Glucose Uptake	
			Control S.E.	Growth Hormone S.E.
160 mg./100 ml.	60 mg./100 ml.	20	4.59	5.04

Difference, +0.45±0.15 (significantly greater than zero); $t=3.00$, $P=0.01$

into fasting mildly diabetic rats 30–45 minutes before death caused the insulin-like effect to rise to a significant level. This is shown in Table III; all results from animals in which the blood sugar at death was greatly below normal have been excluded.

per 100 ml. Some animals were given a supplementary dose of about 0.1 unit about 30 minutes before death. Table IV shows that this treatment effectively restored the "insulin-like" response to growth hormone. As a control, tissue was taken from uninjected diabetic animals from the same batch and from fed normal animals, and incubated at the same time.

TABLE IV.—Effect of Growth Hormone on the Glucose Uptake in mg./g./hr. of Fed Diabetic Rats Injected Two Hours Previously with 0.2 Unit of Insulin. Results from Uninjected Diabetic Rats and From Normal Animals are Included for Comparison. Conditions as in Table I

	Mean Blood Sugar Before Injection	Mean Blood Sugar at Death	No. of Observations	Glucose Uptake	
				Control S.E.	Growth Hormone S.E.
Diabetic rats injected with insulin	430	255	16	1.97	2.28
				Difference, +0.31±0.11 (significantly greater than zero); $t=2.8$, $P=0.02$.	
Diabetic rats not injected	380	415	12	2.23	2.07
				Difference, -0.16±0.15; $t=1.07$, $P=0.10$	
Normal rats	130	6	6	3.11	3.58
				Difference, +0.47±0.17 (significantly greater than zero); $t=2.75$, $P=0.05$.	

Conclusions

These experiments show that growth hormone can have, in certain conditions, an insulin-like effect on muscle from normal rats, but that it does not have this effect on muscle from diabetic rats. Two explanations suggest themselves: that insulin in some way "potentiates" the tissue so that it is able to respond to the growth hormone, or that growth hormone is able to liberate insulin from a complex in which it is inactive; the existence of a compound in human serum which reduces the activity of insulin has been inferred by Marsh and Haugaard (1952). I prefer the second hypothesis as being more fruitful, especially if it is considered that endogenous growth hormone may also liberate insulin in anaerobic conditions. This concept applied to *in vitro* experiments suggests that the great variation in rate of glucose uptake observed in diaphragm experiments is due to the fact that insulin is set free to an extent depending on the oxygen tension of the muscle during the preparation of any experiment. Again, the fact that Krahl was unable to show an insulin-like effect upon muscle from normal animals may have been because in his conditions the "liberation" may have been complete before incubation of the tissue was begun; only with muscle from hypophysectomized animals, lacking any endogenous growth hormone, would it then be possible to demonstrate an *in vitro* effect.

The evidence that this reaction occurs *in vivo* is not at present conclusive. It has been shown that an injection of growth hormone into rats raises the glucose uptake of diaphragm excised at a later time (Park, 1953), and also that more massive doses cause a fall of blood sugar in all but diabetic rats (Milman and Russell, 1950). Both these are insulin-like effects. If the reaction can be shown to occur in physiological conditions it might be regarded as a device to ensure a greater supply of glucose for muscle rendered temporarily anaerobic by a sudden muscular effort.

Two problems arise from this work. One is the nature of the compound which insulin forms in the blood, and the mechanism by which it is liberated; some progress has been made in this direction. The other problem is the characterization of the entity which is responsible for the liberation, and which has been referred to in this paper as "growth hormone." No serious attempt has yet been made in this laboratory to relate the effect to growth potency, or to attempt the preparation of an active submolecule from crystalline growth hormone.

Summary

Conditions are described in which pituitary growth hormone consistently produces an "insulin-like" effect on the glucose uptake of diaphragm from normal rats.

The effect is shown to be absent when the rats have been made diabetic, and to return when diabetic rats are injected with insulin. It is postulated that the effect is due to the liberation by growth hormone of insulin held in an inactive state in the blood or tissue.

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STRUCTURAL CHANGES IN PROSTATIC CANCER AFTER BILATERAL ADRENALECTOMY

REPORT OF A CASE

BY

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[WITH SPECIAL PLATE]

Bilateral adrenalectomy and orchidectomy is claimed by Huggins (Huggins and Scott, 1945; Huggins and Bergenstal, 1952; West *et al.*, 1952) to have induced substantial clinical improvement in some cases of advanced prostatic carcinoma. It is also claimed that post-operative substitution therapy enables the patient to enjoy a fair measure of health and activity. The operation is still in the stage of therapeutic trial, but is being carried out on an increasing number of patients in this country. Most of the published evidence in its support is clinical in character, and remarkably little has been written on the effects of deprivation of adrenal cortical hormones on the structure of the growth and its metastases.

This report concerns a man of 63 with an oestrogen-resistant prostatic carcinoma, who was subjected to orchidectomy with no clinical improvement and finally to bilateral adrenalectomy. He died from an acute pulmonary infection 40 days after this operation. Massive necrosis was found in the primary growth and in its metastases in the regional lymph nodes, liver, and lung. The changes in all these situations had occurred simultaneously a few weeks before death, and, although incapable of rigid scientific proof, it is reasonable to suppose that this widely scattered necrosis was the direct consequence of total deprivation of adrenal hormones.

Case Report

A man aged 63 was admitted to hospital on August 14, 1952, complaining of rectal pain and urinary frequency for six weeks. The prostate was hard, craggy, and fixed. Serum acid phosphatase was 3.3 units (King-Armstrong).

An x-ray film of the spine and pelvis showed osteoarthritis; no metastases. An endoscopic resection on August 19 relieved the urinary symptoms, but the rectal pain persisted, and on September 16 a bilateral subcapsular orchidectomy was done. Severe rectal pain and dysuria increased in spite of this, and was not relieved by large doses of stilboestrol (30–60 mg. daily). He was then transferred to St. Philip's Hospital, where an enlarged liver and palpable enlarged lymph nodes in the groin were found. Bilateral adrenalectomy was advised, and he was transferred to the Central Middlesex Hospital for operation. A pre-operative blood-sugar curve revealed moderately severe diabetes mellitus, but the patient's general condition remained fair.

Substitution therapy with cortisone acetate (200 mg. decreasing to 66.5 mg. daily), deoxycortone (5 mg. daily, decreasing to 5 mg. on alternate days), and sodium chloride (5 g. decreasing to 3 g. daily), as described by Huggins and Bergenstal (1951), was begun on December 4 and continued post-operatively. Both adrenals were removed on December 5 by Mr. J. D. Fergusson. The left kidney was absent. There was no immediate clinical improvement, and stilboestrol, 100 mg. daily, was given from December 22 onwards. The diabetes mellitus remained unchanged and was controlled by diet and insulin, but in spite of this there were a number of hypoglycaemic episodes. On January 14, 1953, he collapsed, complaining of dyspnoea, and died the next day, apparently from a pulmonary embolus.

Post-mortem Examination

Neeropsy was performed eight and half hours after death. The lungs showed basal congestion, scattered bronchopneumonic areas, many small tumour nodules, and a large wedge-shaped area at the periphery of the right upper lobe showing central degeneration and haemorrhage—apparently an infarct, but the pulmonary arteries, which showed nodular atheroma in the large branches, contained no embolus. There were many large and small tumour deposits in the liver, some with a zone of congestion around them. The right kidney was large (weight 13½ oz.; 383 g.). The left kidney and ureter were absent, and the renal vessels on this side were of normal size but ended blindly in a dense mass of fibrous tissue. The adrenals were absent. The bladder was dilated and there were several small diverticula. The left ureteric orifice could not be found. The prostate was largely replaced by a firm nodular tumour mass spreading into the seminal vesicles, periprostatic tissues, and the base of the bladder. The rectum was compressed but not obviously infiltrated. There were large tumour deposits in left and right internal, external, and common iliac, left inguinal, para-aortic, and mediastinal lymph nodes, some of which showed central degeneration. The breasts were normal. Bones (8–12 thoracic, 1–5 lumbar vertebrae, and sacrum) were normal. The pituitary was small. All other organs were normal. The immediate cause of death was thought to be the lesions in the lung.

Histology

Tissues were examined by a "big section" technique which has been in routine use in these laboratories for the past two years. By this method histological sections (5–8 µ) of whole organs are cut and examined microscopically. The pathological changes in this case might have been overlooked had smaller sections been cut, because the extent and distribution of the degenerative changes was much greater than was apparent to the naked eye. In all sections from the primary tumour and metastatic deposits in lymph nodes, liver, and lung there was a massive central necrosis involving both neoplastic tissue and stroma. The necrotic central mass was surrounded by a narrow zone of granulation tissue and, beyond this, a rim of surviving tumour cells (Plate, Figs. 1, 2, and 3). The change involved both large and small deposits, and the zone of granulation tissue was apparently about the same age (2–3 weeks) in all. The ratio between the amount of necrotic and surviving tumour tissue was approximately the same in the primary growth as in its

metastases. No comparable lesions were found in any tissue other than the tumour and its secondaries. In the larger necrotic areas there was some haemorrhage, and occasional blood vessels around the margin were filled with hyaline thrombus and their walls were necrotic. However, in the smaller lesions clumps or even single tumour cells had undergone a hyaline eosinophil necrosis without obvious change in the blood vessels.

In some of these smaller lesions and at the margins of the larger ones a series of degenerative changes were noticed. The outer zone of surviving tumour with cells arranged in solid cords surrounded an inner zone where the cells were separated, the nuclei smaller and more deeply staining, and the cytoplasm more eosinophilic. Towards the centre of the nodule the nuclei had become pyknotic and finally disappeared, leaving clumps of degenerate eosinophil cytoplasm which fused to form a central necrotic mass in which the "ghost" outline of the cells could be seen. This succession of changes suggested that cell degeneration might still have been going on at the periphery, although much more slowly than at first. It would seem that the first change had been necrosis of central tumour cells with secondary necrotic change in the stroma, where large numbers of cells had been destroyed. This stromal change is perhaps due to the release of enzymes from the damaged tumour cells. The surviving tumour is pleomorphic, with solid trabecular, small acinar, and anaplastic areas.

The lung showed bronchopneumonia and some haemorrhage into the wedge-shaped area in the right lower lobe. There were tumour emboli in the subpleural lymphatics. All secondary nodules showed central necrosis.

Discussion

There seems to be no doubt that degenerative changes in the tumour occurred shortly after bilateral adrenalectomy. Necrotic areas in rapidly growing tumours are of course commonly seen, but not as a rule involving both primary and secondary tumours simultaneously. No similar change has been seen in 29 other cases of prostatic carcinoma examined by the "big section" method using post-mortem material. Other possible causes are oestrogens, cortisone, insulin, or some other unknown agent. The first can probably be excluded because the cytotoxic changes it produces in prostatic cancer (Schenken *et al.*, 1942; Fergusson and Franks, 1953) differ from those seen in this case. There is little convincing evidence that cortisone affects the growth of human prostatic tumours (Huggins and Bergenstal, 1952), but a report on one case which showed clinical improvement after such treatment has recently appeared (Hayward, 1953).

It is also unlikely that insulin or the diabetic state could produce such massive necrotic lesions. On the whole the evidence suggested that the changes which occurred in this case were caused by the removal of both adrenals, but the possibility remains that the necrotic changes may be due to the interference with vascular supply so commonly seen in malignant tumours. The histological appearances, however, seem to show that the first degenerative changes took place in the tumour cells, and that these caused secondary changes in the stroma. If blood vessels are involved in this process an added ischaemic necrosis may occur in the area supplied by the vessel.

One further point of interest in this case is the absence of clinical evidence of regression in spite of the massive and widespread destruction of tumour cells.

Summary and Conclusions

Massive central necrosis apparently involving primary and secondary tumours simultaneously was seen in a patient dying six weeks after bilateral adrenalectomy for advanced prostatic cancer. A narrow zone of actively growing tumour cells surrounded these necrotic centres. It is highly probable (but not proved) that

these regressive changes were directly related to the removal of both adrenals. It is important that any similar material should be examined by methods which allow the extent and distribution of any degenerative changes to be appreciated.

The patient was operated on by Mr. J. D. Fergusson, and I am indebted to him and to the research department of the Institute of Urology for the clinical notes and post-mortem material: the case forms part of his series of advanced cancer cases treated by bilateral adrenalectomy, which will be described more fully later. My thanks are also due to Professor G. Hadfield for many helpful suggestions and to Dr. J. Craigie for the photographs.

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HAEMOLYTIC ANAEMIA IN TYPHOID FEVER

A REPORT OF SIX CASES, TOGETHER WITH THE EFFECT OF CHLORAMPHENICOL AND A.C.T.H.

BY

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Acute haemolytic anaemia with haemoglobinuria has been reported as a rare complication of typhoid fever. Osler (1895) encountered one case in his series of 1,500. Curschmann (1898) and Castellanos and Montero (1940) each described one case with recovery. Wright (1945) reported two fatal cases in East Africans. Batty Shaw (1951) described two cases with recovery, but one of these was subsequently thought to be a case of familial haemolytic anaemia. Gordon Smith (1951) reported one case to which chloramphenicol had been given before the onset of the haemoglobinuria.

Before 1945 the occurrence of haemolytic anaemia without haemoglobinuria was reported very infrequently. Under the guise of "acute pernicious anaemia" Mouisset, Mouriquand, and Thévenot (1906), Sicard and Gutmann (1911), Marcora (1919), and Stanzani (1924) reported, in all, five cases. There is no doubt that these were cases of severe haemolytic anaemia. According to Batty Shaw (1951), Kadrnka in 1928 described two cases of acute haemolytic anaemia complicating typhoid fever. Davidson and Fullerton (1938) reported haemolytic crises in a woman with *Salmonella dublin* infection, but she was thought to have a latent haemolytic anaemia.

Berman, Braun, and Rachmilewitz (1945) investigated 152 cases of typhoid fever and found nine cases of haemolytic anaemia of varying degrees of severity. The criteria employed were anaemia, increased reticulocyte count, retentive jaundice, and increased urobilinogen in the urine. In one case there was unequivocal evidence of haemolysis in that urobilinogen excretion in the urine and faeces was estimated quantitatively and found to be significantly raised.

One of us (A. McF.) became interested in the anaemia of typhoid during military service in the Middle East. In the course of haematological investigation of cases of typhoid fever in British and Italian soldiers it became obvious that in a small yet significant number the anaemia was haemolytic in type. Regrettably, most of the records were lost. The investigation was restarted in Hong Kong.

The purpose of this communication is to report six cases of haemolytic anaemia, one of which was associated with haemoglobinuria, occurring during the course of typhoid fever, and to report the effect of chloramphenicol and A.C.T.H. on the course of the anaemia.

Incidence.—From January, 1949, to May, 1952, 129 consecutive cases of *Salm. typhi* infection have been investigated and six cases of haemolytic anaemia encountered, an incidence of 4.6%. In the series reported by Berman *et al.* (1945) the incidence was 5.9%. No cases have occurred in a series of 47 cases of enteric fever due to *Salm. paratyphi* A, B, or C occurring in the same period.

Clinical Findings

All six patients (four male and two female) were Chinese. The age incidence ranged from 19 to 38 years: the ages of the cases are set out in Table I. There was

TABLE I.—Relevant Clinical Findings and Bacteriological Findings in Six Cases of Haemolytic Anaemia Complicating Typhoid Fever

Case No.	Age	Sex	Day of Disease Admitted	Toxaemia	Jaundice	Spleen	Liver	S. typhi Isolated		
								Sternal Marrow Culture	Blood Culture	Stool Culture
1	27	M	10	Moderate	++	7 cm.	5 cm.	+	+	+
2	32	F	14	Severe	++	6 "	4 "	+	+	+
3	19	M	11	"	+	Just palpable	4 "	+	+	+
4	28	F	12	Moderate	++	6 cm.	3 "	+	+	+
5	36	M	9	Severe	++	2 "	4 "	+	+	+
6	38	M	12	"	++	Not felt	6 "	+	+	+

neither personal nor family history of jaundice or anaemia. None had been exposed to toxic substances, nor had any taken drugs recognized as producing haemolysis. There was no history of blood loss.

All patients were admitted in the second week of the disease. With the exception of Case 6, the patient with haemoglobinuria, the history obtained was in no way different from that of uncomplicated typhoid. Again with the exception of Case 6, none of the cases were aware of being jaundiced. Case 6 had a 12-day history of increasing fever, severe frontal headache, progressive general malaise, and abdominal discomfort and distension. He was noticed to be jaundiced for 48 hours before admission. Twelve hours before admission he complained of shivering, backache, and generalized

bone-aching, and a specimen of urine passed six hours later was dark red in colour.

The salient clinical features are set out in Table I. Toxaemia was severe in four cases and moderate in two. Two cases (Nos. 1 and 3) had an unusually profuse eruption of rose spots. All six cases were mildly or moderately jaundiced on admission. The spleen was palpable in five cases, and in three of these it was larger than would be expected in cases of typhoid in the second week. The spleen was not felt in the patient with haemoglobinuria (Case 6). The liver was palpably enlarged in all cases. It was not tender.

Laboratory Findings

The bacteriological findings are set out in Table I and the remaining laboratory findings in Table II. The diagnosis of typhoid fever was established by the isolation of *Salm. typhi* from both sternal marrow and blood cultures in two cases, in two cases from sternal marrow culture alone, and in one case each from blood culture and stool culture.

Cases 1 to 5 inclusive showed a marked increase in the urobilinogen excretion in the urine. This was estimated quantitatively in Cases 3, 4, and 5, and was found to be 31, 21, and 28 mg. a day respectively. In these five cases the direct van den Bergh test was negative, but the indirect van den Bergh was positive, the serum bilirubin ranging from 2.2 to 3.6 mg. per 100 ml. In Case 6 the urine contained haemoglobin and methaemoglobin and there was haemoglobinaemia.

Satisfactory collection of stools from our patients was impossible, consequently the quantitative estimation of urobilinogen in the faeces by the method described by Watson (1937a) could not be carried out. The difficulty of collecting stools from acutely ill patients was appreciated by Watson (1937b), who, to circumvent it, described an application of the qualitative test as a rough quantitative test, according to whether the intensity of the reaction is weak, moderate, or strong. These reactions are recorded as +, ++, and +++ respectively. In Cases 2, 3, 4, and 5, in which this test was carried out, the reaction was strongly positive.

The haematological findings on admission are set out in Table II. It will be seen that all cases were anaemic on admission; the red-cell counts ranged from 1.8 to 2.8 millions per c.mm. and the haemoglobin from 5.8 to 9 g. per 100 ml. The M.C.V. ranged from 100 to 120 μ^3 . The reticulocyte count was raised in all cases to between 8 and 14%. The fragility of the red cells to hypotonic saline was determined in all cases, employing in Case 6 washed red cells. The red-cell fragility range was within normal limits in Cases 1, 5, and 6, whereas it was increased in the remaining three cases. The direct Coombs test was carried out in Cases 1, 2, 3, and 4. It was strongly positive in Cases 3 and 4 and weakly positive in Cases 1 and 2.

TABLE II.—Laboratory Findings in Six Cases of Haemolytic Anaemia Complicating Typhoid Fever

Case No.	Urine		Faecal Urobilinogen	Serum Bilirubin (mg./100 ml.)	Total R.B.C. (mills. per c.mm.)	M.C.V. (μ^3)	Reticulocytes (%)	Osmotic Fragility Range of R.B.C.	Direct Coombs Test	Haemoglobin (g./100 ml.)	White Cell Count				Sternal Marrow	
	Urobilinogen	Haemoglobin									Total W.B.C. (per c.mm.)	Differential				
												N %	E %	L %		M %
1	++	—	Not done	3.6	2.8	111	8	Normal	+	9.0	6,100	82	2	14	2	Normoblastic erythropoiesis with hyperplasia of the erythroid series
2	++	—	+++	3.2	2.2	115	14	0.56-0.40%	+	7.0	10,200	74	—	26	—	
3	31 mg.	—	+++	2.2	2.3	102	9	0.6-0.44%	++	7.6	5,600	42	—	55	3	
4	21 "	—	+++	2.8	2.0	100	8	0.52-0.38%	++	6.9	9,000	78	—	21	1	
5	28 "	—	+++	3.4	2.1	104	10	Normal	Not done	7.1	5,200	48	—	50	2	
6	"	+++	Not done	3.6	1.8	120	8	"	" "	5.8	12,800	78	3	17	2	

The leucocyte count in Cases 2, 4, and 6 showed an increase to between 9,000 and 12,800 per c.mm. In these three cases and in Case 1 the differential count was unusual in that there was a predominance of polymorphonuclear leucocytes, which constituted from 74 to 82% of the total white cells. In Cases 1 and 6 another

unusual finding was the presence of eosinophils in the peripheral blood. Smears of sternal marrow in all cases showed normoblastic erythropoiesis with hyperplasia of the erythroid series.

Since Cases 1 and 2 occurred before the introduction of chloramphenicol and Cases 3 and 4 before A.C.T.H. was available, the six cases may be divided into the following groups:—Group 1: Cases 1 and 2, in which the disease pursued an uninterrupted course. Group 2: Cases 3 and 4, which were treated with chloramphenicol. Group 3: Cases 5 and 6, which were treated with A.C.T.H. and chloramphenicol.

Group 1

The details of the progress of Cases 1 and 2 are set out in Figs. 1 and 2, respectively.

In Case 1 the haematological findings persisted substantially unchanged until the onset of lysis on the 28th day of illness. During the course of lysis the evidence of haemolysis disappeared. There was a fall of serum bilirubin, and urobilinogen was no longer present in excess in the urine after the 34th day. The reticulocyte count declined and the red-cell count and haemoglobin rose progressively. On discharge 52 days after onset the red-cell count was 4.7 millions per c.mm., the haemoglobin 13.8 g. per 100 ml., and the reticulocytes less than 1%.

In Case 2 the severity of the anaemia increased. The red-cell count fell to 1.7 millions two days after admission, when a blood transfusion of 2 pints (1.1 litres) was given. The effect of the transfusion was transient, for after four days the red-cell count had fallen almost to the pre-transfusion level. The patient remained gravely ill for a further period of six days, when, on the 27th day of illness, resolution of the temperature by lysis began. Thereafter there was evidence of improvement. As in Case 1, the indications of haemolysis ceased during lysis. The serum bilirubin fell, and on the 39th day of illness urobilinogen was no longer detected in excess in the urine. On discharge 57 days after onset of the fever the red-cell count was 4.3 millions per c.mm., the haemoglobin 13.4 g. per 100 ml., and the reticulocyte count less than 1%, and the fragility to hypotonic saline within normal limits.

In both cases the direct Coombs test, previously and repeatedly positive, became negative during the phase of resolution of the fever.

Group 2

The details of the progress of Cases 3 and 4 are set out in Figs. 3 and 4, respectively. Treatment with chloramphenicol was started in

Case 3 within 24 hours of admission and in Case 4 four days after admission. In each case a loading dose of 60 mg./kg. of body weight was given and thereafter 60 mg./kg. every 24 hours in divided doses four-hourly for 14 days.

Case 3 was apyrexial five days after starting treatment. Despite control of the infection and improvement in the patient's clinical condition there was deterioration in the blood picture. The red-cell count fell from 2.2 to 1.5 millions per c.mm. and the reticulocytes increased from 9 to 15%. Despite this increased haemolysis the serum bilirubin had fallen from 2.2 to 1.2 mg. per 100 ml. A blood transfusion of 2 pints (1.1 litres) was given on the fifth day of treatment. The effect was transient, for after four days the red-cell count had fallen to 2.0 millions per c.mm. On the 12th day of treatment, the 23rd day of illness, there was a significant drop in reticulocyte count. Thereafter the red-cell count and haemoglobin progressively rose, the reticulocyte count fell to within normal limits, and urobilinogen was no longer detected in excess in the urine on the 27th day of illness. On discharge from hospital on the 34th day the red-cell count was 4.2 millions per c.mm., the haemoglobin 12.2 g. per 100 ml., and the reticulocytes less than 1%.

Case 4 was apyrexial three days after starting treatment with chloramphenicol, but the haematological findings persisted substantially unchanged for a further period of nine days. In this period the serum bilirubin fell from 2.8 to 1.1 mg. per 100 ml. On the 28th day of illness, 12 days after starting treatment, there was a fall in the reticulocyte count. This was followed by a progressive climb in the red-cell count and haemoglobin. Urobilinogen was no longer detected in excess in the urine on the 30th day. On discharge from hospital on the 41st day of illness the red-cell count was 4.8 millions per c.mm., the haemoglobin 14 g. per 100 ml., and the reticulocytes less than 1%.

The Coombs test in each case was positive seven days after resolution of the fever, but it was negative when repeated seven days later. The red cells in both cases on

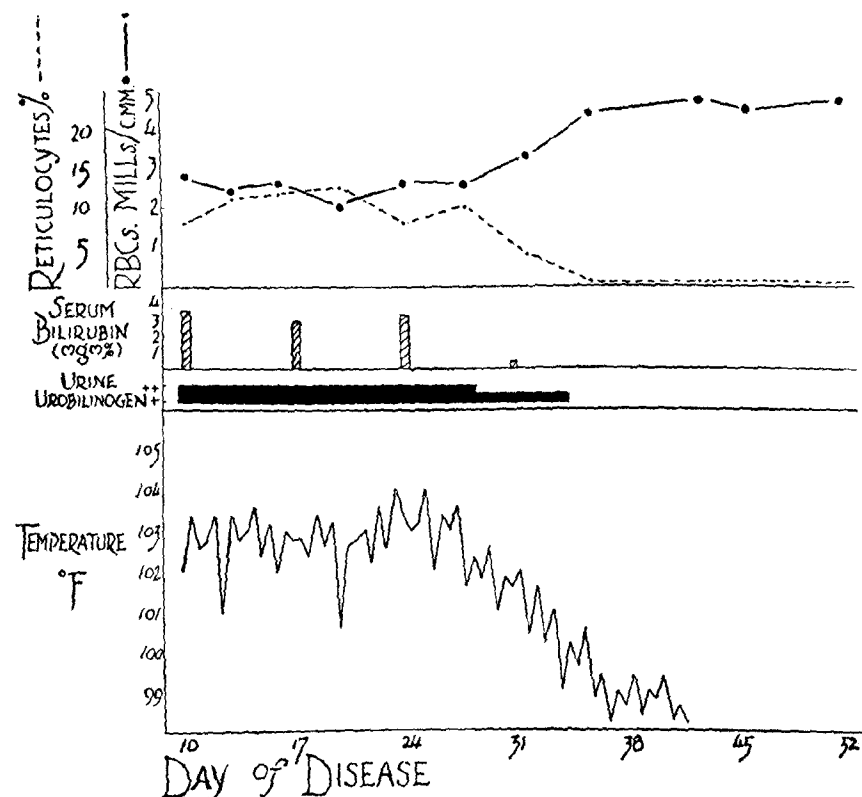


FIG. 1.—Progress of Case 1.

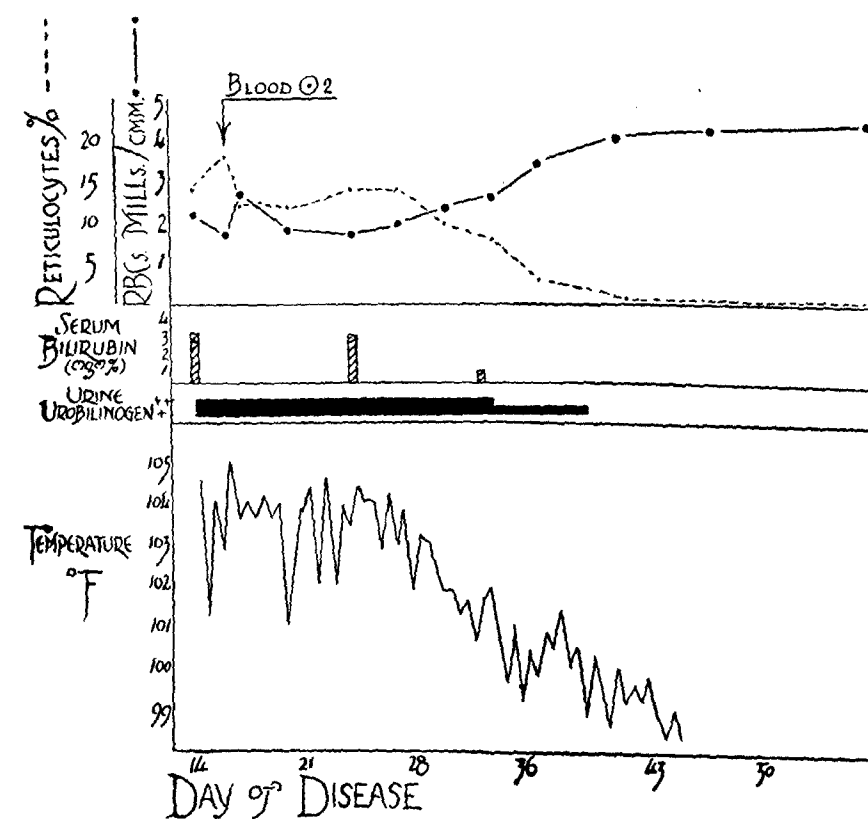


FIG. 2.—Progress of Case 2.

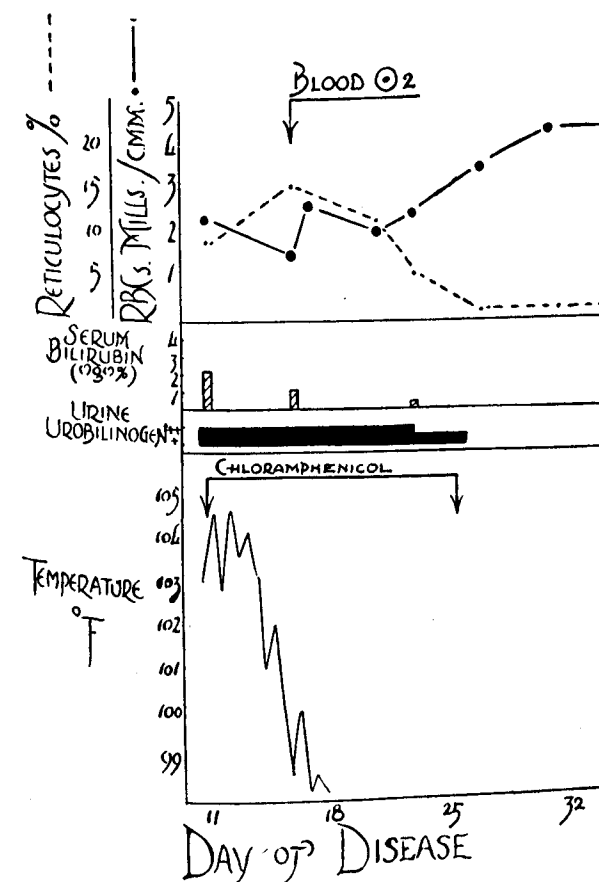


FIG. 3.—Progress of Case 3.

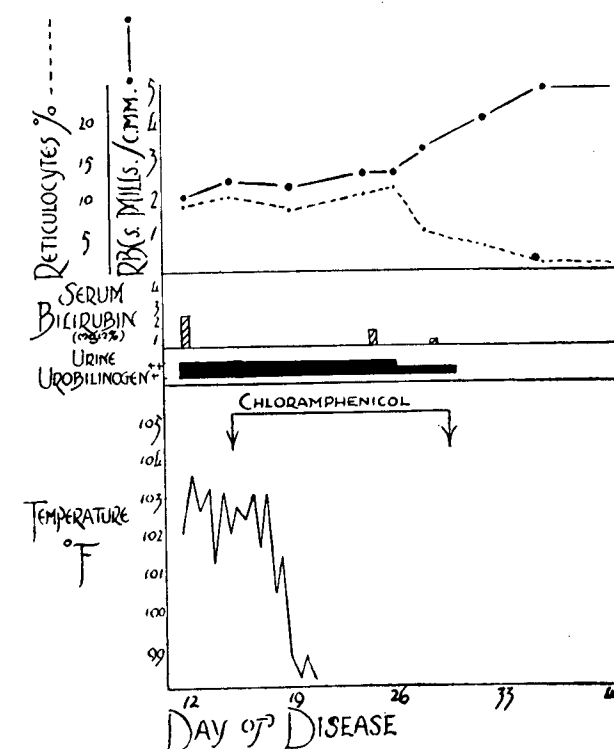


FIG. 4.—Progress of Case 4.

admission had shown an increased fragility to hypotonic saline. Prior to discharge the fragility was within normal limits.

Group 3

The details of the progress of Cases 5 and 6 are set out in Figs. 5 and 6, respectively.

Case 5

Treatment with chloramphenicol was started within the first 24 hours after admission in the same dosage employed in Group 2. At the same time, because of the haemolytic anaemia A.C.T.H. was given. It was administered in 5% glucose by slow intravenous drip, so adjusted that 20 mg. was given over 24 hours. Gordon, Kelsey, and Meyer (1951) have shown that A.C.T.H. by slow continuous intravenous drip induces a quantitatively greater response than does periodic administration. The response to intravenous A.C.T.H. by the method described has in our experience proved satisfactory when treatment is required only for a short period.

Clinical Response.—Improvement was noted within a few hours of starting the drip. Within 24 hours the temperature had fallen to normal and the toxæmia was so reduced that a stuporous confused patient became alert and able to carry on a normal conversation. On the third day the temperature rose to 101° F. (38.3° C.), but fell again to normal on the fourth day and remained so thereafter. On the fourth day the dosage of A.C.T.H. was reduced to 10 mg. over 24 hours, and was discontinued on the 10th day. Chloramphenicol was continued for a further period of four days to a total of 14 days.

Haematological Response.—Two days after starting treatment the serum bilirubin had fallen from 3.4 to 1.8 mg. per 100 ml. In this period the reticulocyte count had risen by 5 to 15%, the haemoglobin by 1.2 to 8.3 g. per 100 ml., and the red-cell count by 0.5 million to a total of 2.6 millions per c.mm. From the second day of treatment there was a rapid decline in the reticulocyte count and a progressive rise in haemoglobin and in the red-cell count. Neither the reduction in dosage nor withdrawal of A.C.T.H. affected the climb. Urobilinogen was no longer detected in excess in the urine on the eighth day of treatment. Thirteen days

after starting treatment the red-cell count was 4.4 millions per c.mm., the haemoglobin 12.6 g. per 100 ml., and the reticulocytes less than 1%.

Case 6

The patient when first seen was confused and an adequate history could not be obtained. A tentative diagnosis of acute haemolytic anaemia of undetermined aetiology was made. Though the haemolysis had produced no circulatory disturbance, in view of the acute onset of the anaemia he was given a transfusion of 1 pint (570 ml.) of blood. A.C.T.H. was administered in the same dosage and by the same technique as in Case 5.

Clinical Response.—The response to treatment was as in Case 5. Improvement was noted within a matter of hours. Eighteen hours after starting treatment toxæmia was much reduced, the temperature had fallen from 104.6 to 100° F. (40.3 to 37.8° C.) and the patient was alert and able to carry on a normal conversation. His appetite returned. The temperature remained around 100° F. (37.8° C.) for a further three days, then rose to 103° F. (39.4° C.) without deterioration in the clinical condition. On the fifth day the bacteriologist reported the isolation of *Salm. typhi*, and chloramphenicol was started in the dosage as in Group 2. On the same day the dose of A.C.T.H. was reduced to 10 mg. over 24 hours. He became apyrexial on the seventh day of treatment and remained so thereafter. A.C.T.H. was withdrawn after 10 days and chloramphenicol after 14 days.

Haematological Response.—The blood transfusion raised the red-cell count from 1.8 to 2.4 millions per c.mm. A specimen of urine passed 22 hours after starting treatment

was free from haemoglobin, as was also a specimen of serum obtained at the same time. The bilirubin content of this specimen of serum was 3.6 mg. per 100 ml., and 24 hours later the serum bilirubin had fallen to 2.0 mg. per 100 ml. Three days after starting treatment the reticulocytes had fallen from 15 to 9%, and the red-cell count had risen to 2.8 millions per c.mm. Thereafter there was a rapid fall in the reticulocyte count and a progressive rise in the red-cell count and haemoglobin, which was unaffected either by reduction of the dose of A.C.T.H. or by its withdrawal. Urobilinogen was no longer present in excess in the urine six days after starting treatment. Fourteen days after starting treatment the red-cell count was 4.8 millions per c.mm., the haemoglobin 12.2 g. per 100 ml., and the reticulocytes less than 1%.

Discussion

The anaemia in all six cases can be accepted as haemolytic in origin. It was associated with an increased reticulocyte count, and sternal marrow biopsy showed a normoblastic hyperplasia. In the absence of blood loss this picture suggests haemolysis.

In Case 6 there was unequivocal evidence of haemolysis. In the remaining cases there was a retentive jaundice. Urobilinogen, measured by the intensity of the qualitative reaction, was present in excess in the urine, and in the three cases in which it was quantitatively estimated the excretion in 24 hours was greatly increased. Faecal urobilinogen, estimated by the intensity of the qualitative reaction as described by Watson (1937b), was increased in the four cases in which it was done. This test has been performed on a series of 20 uncomplicated cases of typhoid, and a strongly positive reaction has never been encountered.

The evidence supports a diagnosis of acquired haemolytic anaemia. There was an absence of family history of

anaemia or jaundice. The Coombs test was positive in the four cases in which it was done, and in Cases 2 and 3 blood transfusion had only a transient effect. Furthermore, the haematological response to A.C.T.H. would appear to confirm this diagnosis. Dameshek (1950), Gardner (1950), Dameshek, Rosenthal, and Schwartz (1951), Davidson, Duthie, Girdwood, and Sinclair (1951), and Clearkin (1952) have reported the satisfactory response of symptomatic or "idiopathic" acquired haemolytic anaemia to A.C.T.H. The haematological response of Cases 5 and 6 to A.C.T.H. was satisfactory. The manifestations of haemolysis ceased, and within 48 hours there was evidence of increase in the red-cell counts and haemoglobin levels, an increase which was progressive. The response of Case 5, to which chloramphenicol was coincidentally administered, can be attributed only to the A.C.T.H., since no response to chloramphenicol alone was encountered in Cases 3 and 4 and since A.C.T.H. alone in Case 6 produced a similar response.

The haemolysis would seem to be intimately associated with the typhoid infection. There was no evidence of exposure to toxic substances or of the taking of drugs recognized as producing haemolysis. There was no previous personal history of jaundice or of anaemia. Although there is no direct evidence of the precise time of onset of the anaemia, in view of the absence of previous history and the cessation of the haemolytic process with resolution of the disease it would seem reasonable to assume that the haemolysis began during the course of the disease. With this assumption, in the present series the onset of haemolysis was in the first two weeks of the disease. Although haemoglobinuria occurred in Case 6 on the 11th day, because of the appearance of jaundice 48 hours before it would seem that haemolysis had already occurred and the haemoglobinuria was due to an exacerbation of the haemolytic process. The time of onset—that is, in the first two weeks—is in agreement with that reported by Berman *et al.* (1945). They record the day of disease in which five of their nine cases were admitted. All five showed evidence of haemolysis on admission; four were admitted towards the end of the second week and one at the end of the first week. Of the 10 cases of haemoglobinuria complicating typhoid fever found in the literature the haemoglobinuria occurred in the first week in five, in the second week in three, and in the third week in two. As in Case 6, the onset of haemoglobinuria does not necessarily indicate the time of onset of haemolysis; for example, the case reported by Gordon Smith (1951) was jaundiced for three days before the onset of haemoglobinuria.

The pathogenesis of the haemolysis is obscure. Members of the *Salmonella* group are normally anhaemolytic, but, as originally shown by Friedberger and Vallen (1923), the addition of bacteriophage to a freshly inoculated sheep-blood-agar plate may turn an anhaemolytic culture of *Salm. typhi* into a haemolytic one. Schiff and Bornstein (1940) confirmed these findings, and concluded that haemolysis occurs if a potentially haemolytic culture is combined with a specific phage of adequate strength. With a surplus of phage no haemolysis occurs, because the phenomenon is bound to the presence of live bacteria. On the other hand, no haemolysis is obtained with too small amounts of phage. It is most unlikely that this mechanism plays a part *in vivo*, for the following reasons. The bacillus/phage haemolysis has been found for sheep's red cells but not for human red cells. As the process requires a nice adjustment of phage and organism it cannot explain the persistence of haemolysis despite control of the infection by chloramphenicol in Cases 3 and 4. Finally, Clearkin (1952) has shown that in guinea-pigs A.C.T.H. does not prevent the action of haemolytic sera *in vivo*; consequently it is unlikely that the effects of a bacillus/phage haemolytic agent would be inhibited.

In Cases 1 and 2, in which the disease pursued an uninterrupted course, the haemolytic process ceased during lysis. This also was the finding of Berman *et al.* (1945). Coincidental with the cessation of haemolysis the direct

Coombs test became negative in both cases. Spontaneous resolution consequently results in the removal of the agent responsible for the haemolysis.

Cases 3 and 4 responded satisfactorily to chloramphenicol and were apyrexial in five and three days respectively. There was, however, no immediate change in the intensity of the haemolytic process; indeed, in Case 3 it was intensified. In this case blood transfusion had a transient effect even though administered while the patient was apyrexial. There was no indication of improvement in the blood picture for seven and nine days respectively following resolution of the fever. The reduction of serum bilirubin which occurred in this period must be attributed to improvement of liver function consequent upon the control of the infection. Furthermore, the direct Coombs test was positive in both cases seven days after the fever had resolved. It was negative when repeated on the 14th day after resolution of the fever. I am aware of only one case of typhoid fever complicated by haemolysis treated with chloramphenicol, and that is the case reported by Gordon Smith (1951). Although haematological details are lacking in his report, it would appear that for 11 days after the patient became apyrexial no improvement in the haematological findings occurred. The significant time lag following control of the infection before cessation of haemolysis and disappearance of the auto-antibody suggests that the typhoid bacilli are not directly responsible for the haemolytic process.

Dameshek and Rosenthal (1951) analysed 36 cases of acquired haemolytic anaemia and found 8 to be idiopathic and 28 symptomatic. Of these 28, 8 were due to chronic lymphatic leukaemia, 4 to Hodgkin's disease, 2 to reticulum-cell sarcoma, 2 to lymphosarcoma, and 1 to infectious mononucleosis. It seems reasonable to suggest that, if these pathological conditions of lymphoid and reticulo-endothelial tissue can result in the appearance of auto-antibody and the occurrence of acquired haemolytic anaemia, the haemolytic process occurring in *Salm. typhi* infection may result from the hyperplasia of lymphoid and reticulo-endothelial tissue which occurs as an essential part of the pathology of the disease. The response of Cases 3 and 4 supports this conception, for resolution of the pathological changes produced by the infection is delayed for a significant period of time following control of the infection by chloramphenicol.

Berman *et al.* (1945) considered that in their series dietary deficiency may have played a part in the production of the haemolysis. In our series the nutrition of all six patients was satisfactory and there was no evidence of any deficiency state.

The effect of A.C.T.H. upon the typhoid state was impressive. The reduction in toxæmia was rapid, improvement being obvious within a few hours. Within 24 hours a stuporous patient in low muttering delirium became alert and rational. This reaction to A.C.T.H. has been reported by Roche (1951). Further experience in the treatment of the severe typhoid state with a combination of A.C.T.H. and chloramphenicol has shown that the response is not invariably so dramatic as in the two cases reported here, but A.C.T.H. is a useful adjunct in the management of typhoid with severe toxæmia in the first few days of chloramphenicol treatment.

Summary

Six cases of haemolytic anaemia, one of which had haemoglobinuria, were encountered in an investigation of 129 cases of *Salm. typhi* infection.

The relevant clinical and laboratory findings are described and discussed.

Evidence is presented that the anaemia is a symptomatic acquired haemolytic anaemia intimately related to the typhoid infection.

The response to chloramphenicol of two patients indicates that the salmonellae are not directly responsible

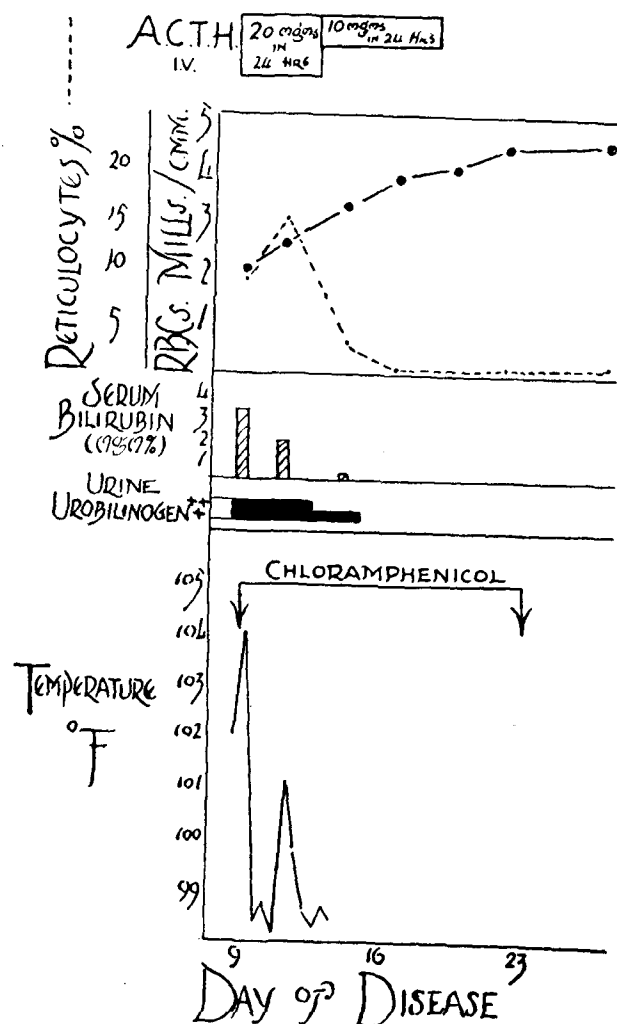


FIG. 5.—Progress of Case 5.

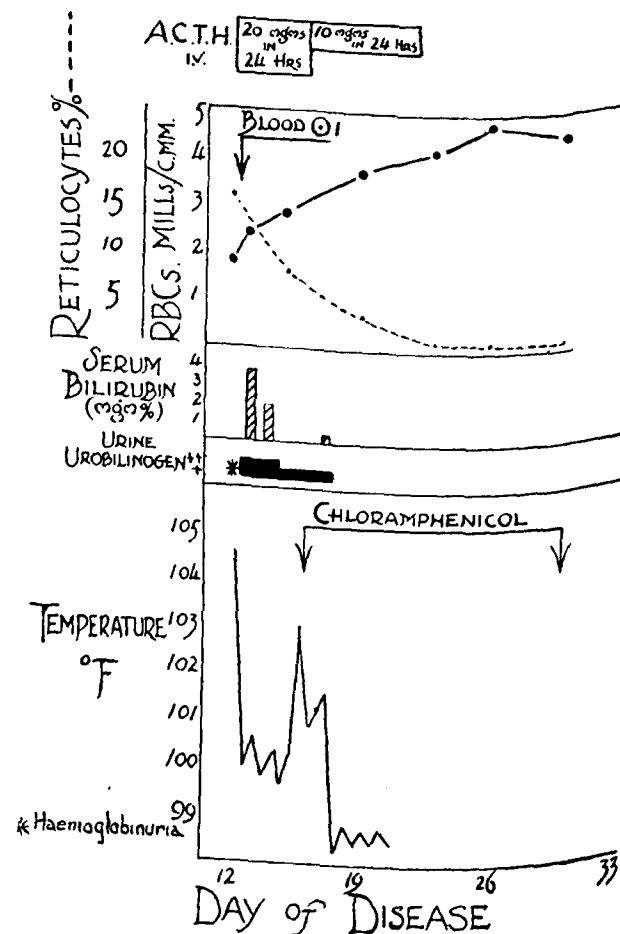


FIG. 6.—Progress of Case 6.

for the haemolysis. It is suggested that the haemolysis may be related to the reticulo-endothelial hyperplasia which occurs in typhoid.

The administration of A.C.T.H. in two cases controlled the haemolytic phenomena and produced prompt improvement in the typhoid state.

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MYXOEDEMA COMA

BY

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In the report of a committee of the Clinical Society of London (1888) on myxoedema it was stated that "intense anaemia, and a variety of nervous symptoms, such as maniacal excitement, coma, etc., precede the fatal event." Scant reference to coma as a terminal event in the natural history of myxoedema is made in modern textbooks or in recent accounts of the disease. The modern tendency is to look upon myxoedema as a readily curable disease and, indeed, hardly to consider it as a cause of death. Le Marquand *et al.* (1953) call attention to the scarcity of recent references to myxoedema as a cause of death and report two fatal cases. The purpose of this paper is to call attention to a terminal coma which is often the manner of death in myxoedema.

The following account is based on five examples of coma seen in four cases of myxoedema during the past few years; in all the cases the diagnosis was subsequently confirmed at necropsy. In one case two episodes of coma occurred.

Case 1

A man aged 59 was admitted to hospital in January, 1950, with a history of watery eyes for 10 weeks and of puffiness of the face for three weeks. There was little of significance in his past history, and apart from malaria during the 1914-18 war he had enjoyed good health. For many years he had complained of "rheumatism" in his right knee. A few days before admission he burned his right leg whilst sitting close to the fire. His face was puffy, especially round the eyes, the lips were thick, and the skin was pale. Axillary hair was absent and the pubic hair scanty. Cerebration was slow, but it was possible to obtain a reasonable history from him. His condition on admission did not give rise to any anxiety, and a series of investigations were planned to assess his endocrine state.

Within 72 hours of admission his condition greatly deteriorated; he became very confused mentally and had delusions of a persecutory nature. Next day he became very drowsy and it was extremely difficult to rouse him; 12 hours later he was stuporous and the plantar responses became extensor. His rectal temperature was 83° F. (28.3° C.). Thyroid extract, 1 gr. (65 mg.) thrice daily, was given as soon as the change in his state was observed, and when he became too drowsy to take oral therapy thyroxine sodium, 1 mg., was given subcutaneously every six hours. This treatment had no effect whatsoever and he died about 96 hours after the first change in his condition was noticed.

Post-mortem examination confirmed the clinical diagnosis of myxoedema. Sections from both lobes of the thyroid showed marked fibrosis. The adrenal glands were of normal size and showed no histological change. The pituitary was normal.

Case 2

A woman aged 65 was admitted to hospital in March, 1951; she had been in hospital on four occasions, and in 1946 a diagnosis of myxoedema was considered. At the time of her admission in 1951 she presented a typical myxoedematous appearance, with a puffy sallow face, sparse head hair, and thin eyebrows. Her voice was croaking. The mental state was one of stupor which gradually, within 48 hours, progressed into deep coma. The vaginal temperature on admission was 75° F. (23.9° C.) and the systolic blood pressure was 70 mm. Hg. The pulse was thin and the rate 60 a minute. The skin was pale and cold; the limbs were flaccid; the deep reflexes could not be elicited, and the plantar responses were extensor.

Thyroxine sodium, 2 mg., was given subcutaneously every six hours from the time of admission. In view of the pronounced hypothermia, and of previous successful experience in hypopituitary coma of raising the temperature by means of immersion in a hot bath, it was decided to attempt this method of treatment. The temperature was raised from 75 to 98.6° F. (23.9 to 37° C.) by immersion in a bath of water, the temperature of which was gradually raised (to avoid burning) to 98.6° F. (37° C.). This procedure had no effect on the coma, and, although the vaginal temperature remained at 98.6° F. (37° C.), the patient died on the following day.

Post-mortem examination showed an extremely small thyroid; in the right lobe was a nodule the size of a cherry stone and in the left a nodule the size of a small bean. Histologically the gland tissue was completely replaced by fibrous tissue in which there were a few groups of shrunken acini. The pituitary and adrenal glands were normal.

Case 3

A man aged 63 was admitted to hospital in February, 1952. Myxoedema had begun about four years previously, and he had taken thyroid intermittently until about a year before his final admission. Clinically he presented gross myxoedematous features, with a flabby yellow face, oedematous infra-orbital tissues, dry swollen hands, thin eyebrows, and sparse head hair. Axillary hair was completely absent and the pubic hair scanty. The voice was croaking and deafness was severe. The blood pressure was 155/100 and the pulse 66. He was mentally clear but sluggish. The rectal temperature was 91.4° F. (33° C.). An electrocardiogram showed slow voltage complexes with flat T waves in all leads. The haemoglobin was 11 g. per 100 ml. and the red-cell count 3,700,000 per c.mm.

Within 48 hours of admission the patient became drowsy, and, with the experience of the previous two cases as a guide, treatment was begun immediately. Thyroid siccum, 1 gr. (65 mg.) thrice daily, was given by mouth, and cortisone, 100 mg., and deoxycortone acetate, 10 mg., were given via an intravenous saline drip. There was no change in his condition during the next 24 hours, but on the following day he was stuporous. The rectal temperature was now only 87.5° F. (30.8° C.), and it was decided to substitute thyroxine

sodium, 2 mg. every six hours, for the thyroid extract, to continue with cortisone, and to attempt to raise the falling body temperature by immersion in a hot bath. This method was followed, and the final rectal temperature was 98.6° F. (37° C.). His condition steadily worsened, and a further 200 mg. of cortisone acetate was given. No improvement was effected and death occurred on the next day.

Post-mortem examination showed an extremely small thyroid in which histologically there was almost complete replacement of glandular elements by fibrous tissue. The pituitary and adrenal glands were normal.

Case 4

A man aged 59 was admitted to hospital in July, 1951. About a year before admission he had noticed that his skin was becoming dry and scaly and that he felt the cold. His hearing was impaired and his memory was failing. At the time of admission his eyes were puffy, the skin was dry, and the voice was croaking, but there was fairly abundant head hair, although the eyebrows were sparse. No thyroid tissue was palpable. The blood pressure was 130/75 and the pulse rate 64. The temperature ranged from 96 to 98° F. (35.6 to 36.7° C.). An electrocardiogram showed low-voltage complexes and negative T waves in all leads. An electroencephalogram showed, with maximum amplification, irregular 8-9 per second rhythm, with the greatest amplitude in the parietal region and also a certain amount of more rapid low amplitude activity in the parietal region. The B.M.R. was -30%, and the 17-ketosteroid excretion ranged between 0.6 and 0.75 mg. a day.

Cerebration at the time of admission was extremely slow and became progressively more sluggish, until on the fourth day after admission the patient was semi-stuporous. Thyroxine sodium, 1 mg., was administered six-hourly. Improvement was observed within 24 hours, and there was a gradual return to a normal conscious level during the next few days. Treatment was continued with thyroid extract.

This patient was readmitted to hospital in November, 1951, and at this time he was very drowsy when first seen. The rectal temperature was 83.5° F. (28.6° C.), the pulse rate 75. Treatment was begun with thyroxine sodium, 1 mg. every six hours, and cortisone acetate, 100 mg. every six hours. Despite treatment he lapsed into unconsciousness and died 48 hours after admission.

Post-mortem examination showed gross thyroid atrophy with replacement of glandular tissue by fibrous tissue. The adrenal glands were normal histologically, but the pituitary showed an excess of basophil cells.

Comment

In these cases it was not possible to carry out all the blood and urine analyses which are normally performed in endocrine investigations. Biochemical investigations were carried out as fully as possible during the terminal stage of the illness, and the results are shown in the Table.

Results of Biochemical Investigations (All Amounts are Given in mg. per 100 ml.)

Case	Sodium	Potassium	Phosphorus	Chlorides	Urea	Glucose	Cholesterol
1	323	22	4.2	—	40	110	180
2	280	22.5	3.9	500	31	140	160
3	276	24	4.0	515	53	94	280
4	304	22	4.1	568	48	—	310

The onset of coma in each case was gradual and progressed from drowsiness to deep, fatal coma within a few days. Le Marquand *et al.* (1953) report a case, however, in which the onset of coma seems to have been more rapid. Case 4 above appears to have had a pre-coma state, and this was prevented from progressing to full coma by prompt treatment.

All the patients were severely myxoedematous at the time of their admission to hospital. The coma in each case was

deep: the limbs were extended and flaccid, and the extremities were cold. The skin was pale, dry, scaly, and cold. The pulse was thready but the rate ranged from 60 to 75 a minute. The systolic blood pressure ranged from 70 to 130 mm. Hg. The tendon reflexes could not usually be elicited, and the plantar responses were sometimes extensor. In view of the occurrence of very low body temperature in hypopituitary coma (Sheehan and Summers, 1952), special note was made of this in these cases. Vaginal or rectal temperatures during coma ranged from 75 to 91.4° F. (23.9 to 33° C.), and was lower than the temperature recorded in some of the patients when not in coma. An incubator thermometer was used to record temperatures below the usual range of a clinical thermometer. Once coma develops it seems to be irreversible, and none of the methods of treatment used were successful.

Diagnosis should not present any difficulty; very gross myxoedematous changes were present in all the cases, and the history, when obtainable, was typical. Hypopituitary coma, particularly when myxoedema features are prominent, may present difficulty. In the common post-partum type of hypopituitarism the history will often make the diagnosis clear.

Discussion

The occurrence of coma as a terminal event in myxoedema is of interest, first, as a problem in the disordered physiology which results from loss of the thyroid secretion, and, secondly, because a very similar type of coma occurs in hypopituitarism (Sheehan and Summers, 1952).

All the cases in the present series had hypothermia, and a similar condition was observed in hypopituitary coma. Le Marquand *et al.* (1953, Case 1) also report hypothermia, and note that their patient was admitted to hospital during the middle of the winter, when they suggest that the risk of hypothermia is greatest. My experience of the present cases supports this observation, all the patients being admitted during the winter months. Although the body temperature was successfully raised to normal in two cases, no improvement was produced and the coma persisted. The temperature regulatory mechanism in severe myxoedema would seem to be influenced by low external temperatures in much the same manner as the temperature of cold-blooded animals. The changes produced by extremely low body temperature in these severely myxoedematous patients are apparently irreversible and elevation of the temperature to normal does not lead to recovery. It becomes a matter of great importance therefore to protect patients with gross myxoedema from severe external cold.

It is tempting to suggest that hypothermia is the cause of coma in these cases, and that these low temperatures are due to the depression of metabolism which results from loss of thyroid secretion. In only one case, in which the development of coma was presumed likely, was it possible to restore the patient with thyroid extract or thyroxine sodium. Once coma had developed administration of thyroxine was without effect, even when used in conjunction with hydrotherapy. Either lack of thyroid is not entirely responsible for the development of hypothermia or the body reaches a state in which it can no longer respond to the stimulus of thyroxine.

Consideration of the first of these possibilities—namely, that lack of thyroid is only part of the story—leads to a study of the recent work on the failure of adrenal cortical function which occurs in myxoedema (Statland and Lerman, 1950) in order to find an explanation of the occurrence of coma. In one of the present cases the 17-ketosteroid excretion was in the range of 0.6 to 0.75 mg. daily, an excretion rate similar to that found in hypopituitarism, and in two cases low levels of serum sodium and chloride were found. The administration of cortisone acetate in one case, and of deoxycortone acetate, saline, and cortisone in another, failed to revive the patients.

Further study of the coma in myxoedema is required to elucidate the pathology of this condition, and it is hoped that further cases of this interesting but rare complication of myxoedema will be reported.

Summary

Four cases of terminal coma occurring in myxoedema are reported. Extremely low body temperatures were recorded in all cases. No treatment so far tried has reversed the coma once it has developed.

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TURNER'S SYNDROME IN THE FEMALE CONGENITAL AGONADISM COMBINED WITH DEVELOPMENTAL ABNORMALITIES

BY

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Hypogonadism, manifesting itself as primary amenorrhoea and lack of development of uterus, vagina, and breasts, without any evident disease of or operative interference with ovaries, thyroid, or intracranial structures, is usually attributed to pituitary insufficiency. The tiny, frail, delicate, fair-skinned dwarf demonstrating the Lorain-Lévi syndrome is the prototype of primary hypopituitarism. One should not, however, label as examples of pituitary deficiency all other hypogonadic individuals with no resemblance whatever to the Lorain type. One such group has now been conclusively proved to be due to primary lack of development of ovaries.

Historical Background

This is recent. In 1938 Turner described seven cases with webbing of the skin of the neck, cubitus valgus, and infantilism. He noted that the short webbed necks of his cases were not due to any vertebral abnormalities, and bore no relation, therefore, to the Klippel-Feil group of conditions. He thought the syndrome might be of pituitary origin.

In 1942 Varney, Kenyon, and Koch reported the cases of four short, sexually retarded females who showed an increase of pituitary gonadotropins in their urine. Laparotomy demonstrated ovarian aplasia, which could not have been pituitary in origin in view of the urinary findings. The same year Albright, Smith, and Fraser (1942) independently demonstrated the primary origin of the syndrome and discussed in detail its differentiation from hypopituitarism on the basis of 11 cases of their own.

In 1944 Wilkins and Fleischmann published an interesting and thoughtful analysis of this syndrome of ovarian agenesis. They again showed a primary lack of development of the ovaries, which were "developed but little, if at all, beyond the stage of the primitive genital ridge." They point out that affected persons, though sexually underdeveloped, are obviously female in appearance, habitus, organs, and inclinations, so that female differentiation itself must be entirely independent of the embryonic gonad. They divide the syndrome into three constituents—first, the gonadal agenesis and its conse-

quences; secondly, the skeletal abnormalities, which cannot be directly occasioned by the ovarian agenesis but must be associated congenital developmental anomalies; and thirdly, other congenital dysgeneses, particularly involving the eye, ear, and aorta. They could find no evidence that the condition is hereditary.

Lisser and his co-workers (1947) were able to report on 25 cases which they had personally observed. They remark upon their extraordinary uniformity in appearance and build, and use the term "shield-like chest" to describe their patients' frontal aspect.

Salient Features of the Syndrome

1. *Gonadal*.—Primary:—Lack of development of ovaries—surgical exploration of some cases (Wilkins and Fleischmann) has revealed "ovaries" consisting of a primitive genital ridge composed only of stroma-like cells. Epithelial or primordial germ-cell proliferation is absent. Secondary:—Primary amenorrhoea—this is invariable, and the usual presenting complaint. The vagina and uterus are infantile in size and in mucosal differentiation. The breasts are non-existent, the nipples pin-point. The pubic hair is usually present but scanty; sometimes absent. Bone age is normal, or only slightly backward. Generalized osteoporosis of varying degree is present. Urinary gonadotropins are increased, the number of mouse units (depending on the method used) usually considerably exceeding 50 in 24 hours (Wilkins and Fleischmann, 1944; Sohval, 1951). Urinary 17-ketosteroids are diminished but not absent, typical values being around 2–5 mg. in 24 hours. Insulin tolerance is normal, with normal hypoglycaemic responsiveness. The appearance is female. Libido is usually present, often strong, and normally heterosexual. Oestrogen therapy leads to development of secondary sexual characters.

2. *Skeletal*.—Stature is short—around 53 in. (135 cm.)—not really dwarfed; rarely tall (Sohval). The build is stocky, thick-set, with wide "shield-like" chest. The span is often wide, some inches greater than the height; otherwise the proportions are normal. Minor vertebral chondrodystrophy is common; the cervical spine, although occasionally bifid, or fused as in Klippel-Feil's disease, is usually normal. Webbed neck is usually but not invariably present. It is remarkable that this odd deformity is so commonly associated with ovarian agenesis and occurs only very rarely in other circumstances. Cubitus valgus—a decreased "carrying angle" was part of the original syndrome described by Turner, but is not invariable. This obtuse angle between the humerus and radius is normally slightly smaller in females than in males, averaging 167 degrees (Gray's Anatomy, 1944). Pes cavus, talipes, syndactyly, and various minor vertebral anomalies also occur.

3. *Associated Anomalies*.—Ocular defects are curiously frequent, squint, ptosis, and cataract being the most common. Coarctation of the aorta has been found several times, and hypertension of independent occurrence is mentioned by Wilkins and Fleischmann. Mental defect and deaf-mutism are reported by those authors.

Diagnosis

Originally the diagnosis of primary ovarian agenesis was established by two special procedures—the direct examination of what genital tissue there was, usually by laparotomy, and the demonstration of increased urinary pituitary gonadotropins, which exculpated the pituitary gland. It was gradually realized, however, that the clinical syndrome as outlined above was so characteristic that it could be diagnosed without such elaborate enterprises; in fact, it has become one of the select group of disorders that can be diagnosed on sight (Case 2). The complaint of primary amenorrhoea, the stocky, thick-set, broad-chested, short individual, with webbed or at least short-looking neck, the lack of breast tissue, pin-point nipples, and minute pale-pink areolae make an unmistakable picture. Cases have

even been diagnosed before the time of puberty (Lisser *et al.*, 1947), the skeletal changes being so characteristic (cf. Case 3).

The elimination of hypopituitarism is easy: sufferers from this are truly dwarfed rather than small, frail and delicate rather than stocky; their necks are normal, their pubic hair is completely absent, their bone age is very backward, their gonadotropin output is very low, and their 17-ketosteroids are minimal. They are extremely sensitive to insulin, so that only one-fifth to one-tenth of the normal amount should be used for tolerance test if hypopituitarism is suspected; and they show hypoglycaemic unresponsiveness (Albright, Smith, and Fraser). Finally, oestrogens do not produce any response in respect of secondary sexual characters.

The following cases all presented themselves at Groote Schuur Hospital within the course of a few weeks.

Case 1

A girl aged 18 complained of never having menstruated. She had always been somewhat smaller than her friends of the same age. Pubic and axillary hair had developed at 15. She was mentally bright and had done well at school. Her sex feelings were apparently normally strong. She had a

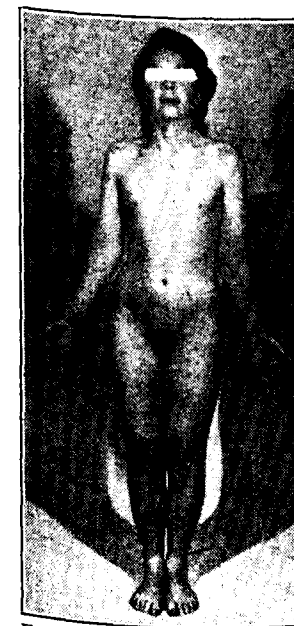


FIG. 1.—Case 1. Webbed neck, thick-set build, pin-point nipples, fair pubic hair.

were infantile, and uterine scraping produced no endometrial tissue. Other systems were normal. The blood pressure was 140/90 mm. Hg.

Radiographs showed slight general osteoporosis. The bone age was within normal limits, a little behind that of the control of same age and sex. The right twelfth rib was missing, and there were minor irregularities of vertebral bodies. The skull was normal except for slight porosis of the middle table. The B.M.R. was -13% and -19% (two estimations on Sanborn metabor); E.C.G. normal; and the Wassermann reaction negative.

The first insulin-tolerance test showed resistance:

Fasting	105 mg. per 100 ml.
10 minutes after 4.5 units insulin I.V.	99 mg. per 100 ml.
20 "	94 "
30 "	98 "
40 "	108 "
60 "	98 "

Repetition of the test gave more normal figures; certainly no undue sensitivity was shown. The 17-ketosteroids were (1)

2.4 mg. per 24 hours (normal 6–15 mg.); (2) 2.6 mg.; serum cholesterol, 360 mg. per 100 ml.; urine gonadotropins (F.S.H.), positive at 96 mouse uterine units per 24 hours (method of Klinefelter, Albright, and Griswold, 1943).

Stilboestrol, 1 mg. a day, was given for three weeks of every four, with ethisterone, 10 mg. a day, for the last 14 days of each four-weeks cycle. An apparently normal period of five days' duration occurred after the first month. Development of breasts and growth and pigmentation of nipples and areolae were evident after two months.

Comment.—This was a very typical case of ovarian agenesis, with the low B.M.R. and high cholesterol (not repeated) as the only unexpected features. She bore no mental, clinical, or skeletal resemblance to a cretin.

Case 2

Within a week of the admission of Case 1, a coloured girl aged 17 presented herself, quite fortuitously, to one of us at the out-patient department. Her very appearance—short, dumpy, and short-necked, with ocular asymmetry—was enough to suggest the syndrome. After a complaint of primary amenorrhoea, we were able to predict the other typical features. She denied all sex feelings. All her family were normal, including two sisters.

Examination revealed a short, thick-set girl with much redundant fat around the trunk. Her neck was short and broad, but without a definite "web." Her eyes were asymmetrical in setting, the palpebral fissure being lower on the right. They also showed divergent strabismus, with nystagmus on looking to the right. Pubic and axillary hair was absent. Breast tissue was also absent; the nipples were tiny and inverted. Her chest was thick-set and fitted the description "shield-like." Her weight was 91 lb. (41.3 kg.); height, 51 in. (130 cm.); span, 51 in. (130 cm.); pubic height (lower segment), 24 in. (61 cm.); upper segment, 27 in. (69 cm.); head circumference, 21 in. (53 cm.). Internal examination of the genitalia was not permitted. Other systems were normal. The blood pressure was 145/85 mm. Hg.



FIG. 2.—Case 2. Asymmetry of twelfth ribs and only four lumbar vertebrae.

Radiographs showed slight generalized osteoporosis with coarsened trabeculation, particularly well seen in the sacrum (Fig. 2). Bony cortices were poorly defined. The hand bones were thin, but the bone age was normal. The twelfth ribs were small and asymmetrical, and one lumbar vertebra was missing (Fig. 2). The cervical vertebral line was straight but there were no individual abnormalities. The Wassermann reaction was negative. The insulin tolerance was normal:

Fasting	84 mg. per 100 ml.
10 minutes after 4.5 units insulin I.V.	82 "
20 "	62 "
30 "	55 "
40 "	75 "

The 17-ketosteroids were (1) 4.2 mg. per 24 hours, (2) 5.2 mg.; serum cholesterol, 210 mg. per 100 ml.; urine gonadotropins, strongly positive at 192 mouse units (normal, under 50).

Comment.—This was another typical case, though without true webbing of the neck. Complete absence of

secondary hair is not usual, but may occur in this syndrome. Her measurements are actually the opposite of eunuchoid (with larger lower segment), and lend weight to the belief that the statural peculiarities are not themselves due to gonadal deprivation. She did not bother to follow her treatment schedule.

Case 3

A red-haired girl aged 9½ complained of a discharging ear. Her performance at school was quite good. There was no relevant family history. She is an only child.

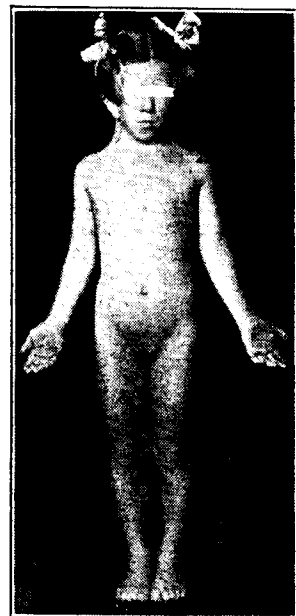


FIG. 3.—Case 3. Marked webbing of neck. Tiny nipples, good muscular development.

Examination revealed a short stocky girl, with strong muscles and a stumpy figure (Fig. 3). Her neck was very plainly webbed. Her head and eyes were not abnormal, except that her palate was high-arched. Although she was under 10 years old her nipples were certainly smaller than normal (Fig. 3)—almost invisible. The "shield-shape" of her chest was undeniable. Her blood pressure was 160/100 mm. Hg. Her height was 44½ in. (113 cm.)—normal 52 in. (132 cm.); span, 46 in. (117 cm.); lower segment, 20½ in. (52 cm.), upper segment, 24 in. (61 cm.).

Radiographs again showed mild generalized porosis with coarsening of bone structure, well marked around the acetabula. The bone age was normal.

Comment.—Despite the young age and the absence of special examinations, we have no hesitation in forecasting a lack of development of breast tissue and of menstruation. The hypertension was noteworthy.

Factors Involved in the Syndrome

The curious clinical attributes of these patients have made them subject to much pathogenetic speculation. Most writers, accepting a genetic ovarian defect, agree that this alone cannot explain all the abnormalities. The occurrence of multiple congenital anomalies in the syndrome makes it likely that shortness of stature is but one manifestation of a germinally defective soma, not directly related to the degree of ovarian agenesis (Sohval, 1951; Wilkins and Fleischmann, 1944). Indeed, a feature such as cubitus valgus is an anthropomorphic feminism, while skeletal lengthening, rather than shortening, typically follows oestrogen lack at an early age ("eunuchoidism").

The frequent osteoporosis may be ascribed to the loss of osteoblastic effect of oestrogens, and is comparable to the similar condition of menopausal women (Albright and Reifenstein). In this syndrome of ovarian agenesis, however, the osteoporosis, although slight, is more universal than is the typical vertebral rarefaction of menopausal females.

By the same token it has been suggested by Wilkins and Fleischmann that hypertension (present in some degree in our three cases, without evidence of coarctation) is comparable to that found in Cushing's syndrome and the postmenopausal state in which there is also an oestrogen deficit associated with persistence of adrenocortical androgens.

The extremely rare findings of good breast development (Lisser *et al.*, 1947; Hertz *et al.*, 1950) and of diminished urinary gonadotropins (Hertz *et al.*) with proved absence of ovarian tissue are not readily understood.

Role of Adrenal Cortex

The presence of a little pubic and axillary hair and urinary 17-ketosteroids in Turner's syndrome is ascribable with fair certainty to adrenal activity. Albright *et al.* (1942) contended that this adrenal cortical function is nevertheless below normal, conceivably as a result of altered pituitary stimulation in the anovarian state. He therefore blames the adrenal cortex for a decreased growth rate and consequent shortness of the patients.

With this problem in mind, we applied some of the recently adopted tests for adrenal cortical function (Thorn and Forsham, 1950) to our Cases 1 and 2. Circulating eosinophils and the urinary uric-acid/creatinine ratio were determined before and after an intramuscular injection of 25 mg. of A.C.T.H. (see Table).

Thorn Test

Case No.	Eosinophils per c.mm.			Uric-acid/Creatinine Ratio		
	Before A.C.T.H.	After A.C.T.H.	Fall	Before A.C.T.H.	After A.C.T.H.	Rise
1	120	50	58.3%	0.36	0.67	83.7%
2	80	30	62.5%	0.66	0.96	46.4%

A fall of 50% or more in circulating eosinophils and a rise of more than 50% in the uric-acid/creatinine ratio are said to denote adequate adrenal cortical function. By these criteria, in neither Case 1 nor Case 2 were the adrenals responsible for any of the shortcomings; but it is by no means acceptable that such procedures test all functional modalities with equal fairness. Bartter, Forbes, and Albright (1950) measured the effects of A.C.T.H. administration on steroid, electrolyte, and nitrogen metabolism in a case of ovarian agenesis. They interpreted the results as confirming slight hypofunction of the adrenal cortex, but concurrent findings in a normal control are not given. Further study in this field may be of value in augmenting the scope of hormonal treatment in these little women.

Summary

All congenital hypogonadism is not of pituitary origin. The syndrome of primary ovarian aplasia is described, starting with a brief account of the history of the recognition of the condition. Turner in 1938 first remarked the peculiar combination of webbed neck, short stature, and female infantilism. The important features of the condition are considered, and these are so characteristic as to present an unmistakable and readily diagnosable picture, plainly distinct from primary hypopituitarism, cretinism, eunuchoidism, or any other clinical state. Final proof of diagnosis is to be sought in the urinary gonadotropin level and the laparotomy finding of lack of ovarian tissue, but these are really unnecessary embellishments of a cast-iron clinical diagnosis.

Two illustrative cases are described, both with high urinary F.S.H. A third case is presented, and although the patient is only 10 years old we believe the diagnosis to be ineluctable.

The curious conglomeration of congenital anomalies in the clinical picture is discussed. The modern tests of suprarenal function were applied to the first two cases, and normal responses were obtained.

We are pleased to thank Professor F. Forman for his interest and advice in this article, and Dr. W. H. Opie for permission to report the third case. Dr. H. Zwarenstein kindly performed the tests for gonadotropins. We are indebted to the radiological department of Groote Schuur Hospital for the x-ray film and to Mr. B. Todt for the photographs.

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TURNER'S SYNDROME IN THE MALE

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Turner's syndrome in the female (Turner, 1938; Wilkins and Fleischmann, 1944; Lisser *et al.*, 1947; Jackson and Sougin-Mibashan, 1953) is characterized by lack of development of the ovaries, short stature, webbing of the neck and other skeletal abnormalities. Ovarian agenesis means lack of Graafian follicles and hence an absence of both ova and female sex hormones (germinal and endocrinal deficiency). The affected person therefore is not fertile, does not menstruate, and lacks breast development, while her pituitary gland produces large amounts of gonadotropic hormone in an attempt to stimulate a non-existent end-organ.

The Male Homologue

It is not so easy to define the homologous condition in the male, because in the testis the germinal tissue and the endocrine tissue (believed to be situated in the Leydig cells) are separate, so that a lack of development of either one or both might be claimed to represent the sexual side of "male Turner's syndrome." Engle (1950) suggested that an absence of tubular germinal epithelium should be the basic

TABLE I.—Theoretical Features of Pure Germinal Agenesis, Pure Testicular Endocrinal Agenesis, and a Mixture of Both

	Germinal	Endocrinal	Mixed
Testes	Small	Normal	Small
Sperm	Azoospermia	Present (biopsy)	Absent
Penis	Normal	Small	Small
Potency	Potent	Impotent	Impotent
Body hair	Normal	Diminished	Diminished
Voice	Normal	High	High
Gynaecomastia	No*	May occur	May occur
Span	Normal	Large	Large
Osteoporosis	No	Yes	Yes
F.S.H.	Normal*	High	High
17-Ketosteroids	Normal	Reduced	Reduced

* These are doubtful because of the possibility that the germinal epithelium may also form a specific hormone (Sohval, 1951).

analogous condition. Sohval (1951), apparently agreeing with this, points out that there may be variable impairment of testicular secretory function in addition. There may thus be a variability in the presence and degree of hormonal disturbance in the "male Turner." The theoretical effects of pure germinal and pure endocrinal agenesis are shown in Table I.

This consideration explains why the five cases of male Turner's syndrome so far reported (Flavell, 1943; McCullagh, 1948; Greenblatt and Nieburgs, 1948; Reforzo-Membrives *et al.*, 1949; Sohval, 1951)* are less homogenous than the female group, since they show varying degrees of endocrinal deficiency and will not, for instance, be expected necessarily to have high urinary gonadotropins. The K.R.A. syndrome (Klinefelter, Reifenstein, and Albright, 1942) is somewhat comparable, comprising azoospermia, small testicles, high urinary F.S.H., and gynaecomastia. The basic lesion is different—a hyalinization and sclerosis of tubules rather than a lack of development. This syndrome has been expanded by Heller and Nelson (1945) and Howard *et al.* (1950) to contain cases without gynaecomastia and with a variable degree of androgen insufficiency, while retaining the basic pathological change. As with the "male Turner," therefore, the K.R.A. syndrome becomes a resultant of mixed germinal and endocrinal deficiencies. The special features of Turner's syndrome in the male, as in the female, include shortness and stockiness in stature and the various skeletal anomalies of which webbing of the neck is most outstanding, while the gonadal lesion is one of lack of development.

Table II shows the nature of the "mixture" of germinal and endocrinal defects in reported cases of male Turner's syndrome and compares this with the K.R.A. condition. This table includes the following case, which we believe to be an example of male Turner's syndrome.

* Rossi and Caffisch (1951) mention other cases from the Continental literature, but we lack detailed information concerning these.

TABLE II.—Features of the "Male Turner" and the Klinefelter-Reifenstein-Albright (K.R.A.) Syndrome

	Classical K.R.A.	Modified K.R.A.	Flavell's Case	McCullagh's Case	Greenblatt's Case	Reforzo-Membrives's Case*	Sohval's Case	Present Case
Testes	Small	Small	Small	Small	Small	Small	Small	Small
Sperm	Azoospermia	Azoospermia	—	—	Azoospermia	—	No semen	No semen
Penis	Normal	Variable	Normal	—	Large	Normal	Small	Normal
Potency	—	—	—	—	—	—	No ejaculation	Totally impotent
Body hair	Masculine	—	—	—	—	—	—	Very hairy
Voice	—	—	Sparse and female	—	—	—	Sparse and female	High-ish
Gynaecomastia	Yes	—	High	High	—	—	Masculine	No
Stature	—	—	Short	—	Short	—	Short	Short
Span	Normal	Normal	—	Short	—	—	—	Wide
Congenital anomalies	Nil	Nil	Webbed neck, cubitus valgus, cervical spina bifida	Webbed neck, cubitus valgus, microphthalmos	Webbed neck, cubitus valgus	Webbed neck, cubitus valgus, epicanthic folds	Cubitus valgus, cervical vertebral anomalies	Webbed neck, no valgus
Osteoporosis	No	No	—	—	—	—	No	Yes
17-Ketosteroids	Normal	Low	—	Low	Low normal	Low	Low normal	Low
F.S.H.	High	High	—	Normal	Normal	—	High	High
Testicular biopsy	—	Tubular sclerosis and hyalinization; clumps of Leydig cells	—	Hypoplasia, no Leydig cells	Tubular hypoplasia, Leydig cells present	As in pituitary dwarfism	Tubular aplasia, Leydig cells present	—

The sign — denotes lack of information. * Two similar cases in early childhood (aged 7 and 3 respectively) have been reported by Cunningham and Harley (1951) and Dorff *et al.* (1948) without testicular biopsies.

Case Report

A coloured houseboy aged 30, of simple, facile, cheerful, and deceitful character, came to hospital complaining of a vague respiratory illness. He had always been of small stature: height, 58½ in. (149 cm.); span, 60½ in. (154 cm.); lower segment, 29 in. (74 cm.); upper segment, 29½ in. (75 cm.). His neck was markedly webbed (Fig. 2). There was no cubitus valgus. His muscles were very well developed—a midget "Mr. Universe." Sexually he also appeared fully equipped (Fig. 1), yet he denied having ever experienced sexual feelings of any kind and stated he had never had an erection or an emission. (Curiously, one of the few reported male cases had an enlarged phallus (Greenblatt and Nieburgs, 1948) as a possible additional congenital abnormality.) We were unable to obtain a specimen of semen. There was some disagreement regarding the size and consistency of the testes—possibly smaller and firmer than usual. The prostate was small. The blood pressure was 145/75 mm. Hg.

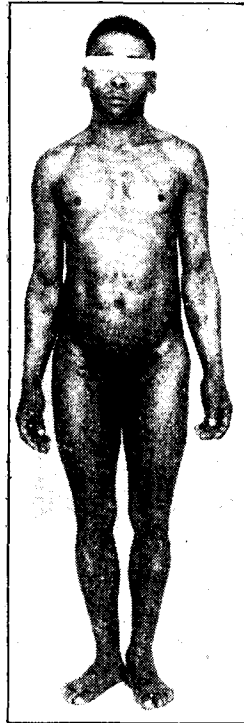


FIG. 1.—Short and muscular, with masculine stature and well-developed phallus.

Radiographs showed mild generalized osteoporosis. The 17-ketosteroids were 5.9 mg. per 24 hours (single estimation—method of Holtorff and Koch, 1940). The Wassermann reaction was negative. Urinary gonadotropins: 96 units per 24 hours (method of Klinefelter, Albright, and Griswold, 1943).

Unfortunately the crucial test—a testicular biopsy—was refused, and the patient left not only hospital but also the district with his employer's belongings before we could get urine to repeat our estimations. However, the high gonadotropins certainly confirm the presence of primary gonadal deficiency.

Summary

We have observed a case representing Turner's syndrome in the male—the homologue of ovarian agenesis

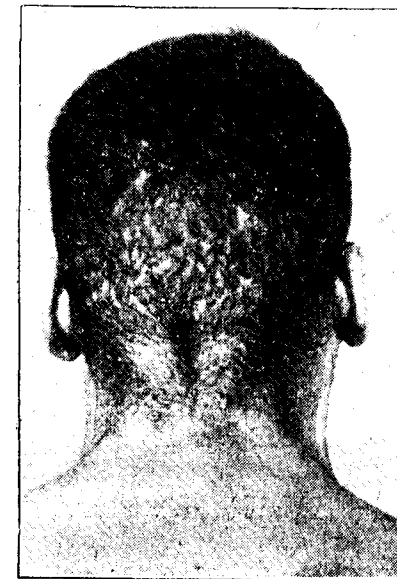


FIG. 2.—Note webbing of neck.

with short stature and congenital anomalies. We have made this an excuse for a consideration of what the male homologue should be and for a comparison of this with the Klinefelter-Reifenstein-Albright syndrome.

We conclude that the absence of homogeneity in the various reports of these conditions is due to the separation of endocrinal and germinal tissue in the male gonad,

whereas in the female gonad one single tissue—the Graafian follicle—serves both endocrinal and germinal functions.

We wish to thank Professor F. Forman for his interest, Professor G. C. Linder and Dr. H. Zwarenstein and their departments for the special assay, and Mr. B. Todt for the photographs.

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ELECTROLYTE IMBALANCE AFTER
OPERATION FOR PITUITARY
TUMOUR

BY

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A proportion of patients who have a pituitary adenoma or cyst present clinical evidence of hypopituitarism. Further light has been shed on this syndrome by Sheehan (1939) and Sheehan and Summers (1949), and by the development of biochemical tests of endocrine function.

In patients undergoing surgical treatment a hypopituitary crisis may be precipitated by the stress of the operation and by disturbance of function of the remaining pituitary tissue. This may prove fatal. Grant (1948), in his series of 71 cases, reported three in which a relatively simple operation was followed by stupor, coma, and death on the fifth, ninth, and twelfth days. At necropsy on two of these atrophy of the gonads and adrenal and thyroid glands was demonstrated.

The crisis may present with a variety of endocrine and biochemical disturbances, but is commonly characterized by the gradual onset of drowsiness progressing to stupor and coma, usually over a number of days. It is sometimes preceded by convulsions (Sheehan and Summers, 1952).

The management of hypopituitarism has advanced considerably in recent years. A combination of testosterone, thyroid, and deoxycortone acetate (D.C.A.) as substitution therapy is usually employed (Robertson and Kirkpatrick, 1951a), but cortisone and adrenocorticotrophic hormone (A.C.T.H.) have been used with more striking effect (Robertson and Kirkpatrick, 1951b; Summers and Sheehan, 1951; Rolland and Matthews, 1952).

Treatment of the emergency of hypopituitary coma has been discussed by Sheehan and Summers (1952):

intravenous glucose, testosterone, thyroid, and the control of hypothermia, if present, are all of value. Allott and Simmons (1951) describe a case which rapidly improved with cortisone. Caughey, James, and Macleod (1952) describe four patients who passed into a state of stupor following removal of pituitary adenomas, associated with a low blood sodium and chloride. In two cases cortisone was given with good effect, and subsequent substitution therapy with testosterone, thyroid, and D.C.A. was used.

The following case is one of a series in which A.C.T.H. is being employed pre- and post-operatively in patients with pituitary tumours who show clinical or laboratory evidence of pituitary hypofunction.

Case History

A man aged 41 was first seen in March, 1950, complaining of headaches and impaired vision for the previous three months. He had also noticed impotence and loss of libido for about a year, and had come to dislike cold weather intensely.

On examination he was found to be of normal physique. His skin was soft and pale, with absence of pigmentation. The facies was flabby, with pallor of the cheeks; his speech was quiet and slow. Scalp hair was fine and silky and pubic hair was present, but the axillary hair and beard were scanty; he shaved twice a week. The thyroid was not palpable, and there was marked atrophy of the testes. The blood pressure was 100/70 mm. Hg. There was early optic atrophy. Perimetry showed an early incomplete bitemporal hemianopia. The lumbar cerebrospinal fluid (C.S.F.) pressure was normal, and the protein 65 mg. per 100 ml. A radiograph of the skull showed an enlarged pituitary fossa with preservation of the posterior clinoid processes.

During the next month the headaches became less severe and his vision returned to normal. Surgical intervention was deferred. After a few months of relief, however, his headaches returned, and during the latter part of 1951 his vision became steadily worse. He also suffered from intense lassitude and the facial hair became sparser.

When readmitted to the neurosurgical unit in February, 1952, his visual acuity was 6/9 partly for both eyes, there was marked bilateral optic atrophy, and the bitemporal hemianopia had increased. The blood pressure was 114/90 mm. Hg; plasma cholesterol, 290 mg. per 100 ml.; and the C.S.F. protein had increased to 120 mg. per 100 ml. Laboratory tests of metabolic and endocrine function confirmed the clinical evidence of a severe degree of pituitary hypofunction. The glucose-tolerance curve was "flat" (rising to 100 mg. per 100 ml. one and half hours after 50 g. of glucose by mouth), and a fractional test meal showed a low gastric acidity. The Kepler test for adrenocortical insufficiency gave a coefficient A of 10.8 (normal over 30). The plasma chloride level was 605 mg. per 100 ml., and the urinary chloride concentration during the Kepler test was 11 g. per litre.

Pre-operative A.C.T.H. substitution therapy (40 mg. daily intramuscularly) was begun 12 days before operation. This produced improvement in his physical energy, and he felt less lethargic than for many years. The laboratory tests were repeated after a week of treatment and significant changes in the results were noted. The glucose-tolerance curve assumed normal proportions (rising to 182 mg. per 100 ml. one and half hours after 50 g. of glucose) and there was an increase in the gastric acidity. The Kepler coefficient A was now 25.5 and the plasma chloride 630 mg. per 100 ml. During the test the urinary chloride concentration was 2.3 g. per litre.

A right frontal craniotomy was performed on April 15 by Mr. D. G. Phillips. Elevation of the frontal lobe revealed a rounded swelling arising from the pituitary fossa and displacing the optic chiasma forwards. Aspiration produced 4 ml. of dark-brown fluid containing cholesterol

crystals. This was enough to decompress the chiasma, and after removal of a fragment of cyst wall the wound was closed without drainage.

The immediate post-operative period was without incident. The blood pressure was maintained, and there was a rapid return of consciousness. A.C.T.H. (40 mg. daily) was continued for the next six days, being reduced to 20 mg. over the final 48 hours. The urinary output remained within normal limits (1–1.5 litres a day) and there was no polydipsia. Two days after A.C.T.H. had been discontinued the patient vomited twice and the urinary chloride concentration was found to be 11.8 g. per litre. He became rather lethargic and disinterested and continued so for the next few days.

Twelve days after the operation he vomited again and complained of numbness in the left hand. He was found to have a hemiparesis affecting this side. Next day (April 28) the lethargy and drowsiness were more evident, and there was a marked generalized muscular weakness. The blood pressure was 100/80 mm. Hg, pulse rate 92, and temperature 98.6° F. (37° C.). Testosterone, 100 mg., D.C.A., 5 mg., and thyroid, ½ gr. (16 mg.), were given daily.

During the next 48 hours the blood pressure fell to 90/65 mm. Hg, the stupor and hemiparesis became worse, and he had a number of epileptic attacks affecting the left side. Because of this, on April 30 the craniotomy wound was reopened under local analgesia. Apart from a small subdural blood clot and a localized collection of C.S.F. in the region of the optic chiasma, nothing abnormal was found. There was no significant brain oedema and it was doubtful if the findings adequately accounted for the late deterioration. The wound was resutured with drainage, the bone flap being removed as a precautionary measure lest brain oedema occur. Penicillin, 100,000 units, was given four-hourly.

On return to the ward the blood pressure fell to 80/65 mm. Hg, and the pulse rose to 140. Blood transfusion and intravenous "methedrine" (30 mg.) had no effect on the hypotension. Estimation of the blood electrolytes revealed that there was a severe sodium and chloride deficiency. The plasma sodium was 287 mg. per 100 ml., plasma chloride 539 mg. per 100 ml., and serum potassium 18 mg. per 100 ml. (normal ranges being 310 to 345 mg., 590 to 625 mg. as NaCl, and 17 to 20 mg. respectively).

A.C.T.H., 60 mg., was given intramuscularly, together with 30 g. of sodium chloride—20 g. as a hypertonic solution intravenously, and the remainder, with 5 g. of potassium chloride, by oesophageal tube. Within an hour of the saline administration the blood pressure rose to 100/75 mm. Hg, and remained at this level; the patient also became more alert and easily roused to take fluids by mouth.

Throughout the next day his improvement continued and the hemiparesis was now only just perceptible. Estimation of the blood chemistry showed that the plasma sodium was 306 mg. per 100 ml., and the chloride and potassium 585 mg. and 18.4 mg. per 100 ml. respectively. The blood sugar was 164 mg. per 100 ml. Substitution therapy with 80 mg. of A.C.T.H. per day was continued, plus supplementary sodium chloride by mouth to balance the urinary loss.

His relative well-being was short-lived; four days later he again became drowsy and unresponsive to questions. This was accompanied by pyrexia and signs of pneumonia. The penicillin was stopped and chloramphenicol, 1 g. six-hourly, substituted. He remained very ill during the next two days, and developed slight oedema of the hands and sacral region; because of this the supplementary oral salt was reduced. An electrocardiogram at this stage showed low-voltage waves, but no evidence of hypoalkalaemia or hyperalkalaemia or of hypocalcaemia or hypercalcaemia. The jugular venous pressure was not visibly raised.

The urinary output, which had been balancing his fluid intake, fell on May 5 to 0.5 litre. Accompanying this, the

plasma sodium increased to 414 mg. per 100 ml. and the chloride to 719 mg. per 100 ml. There was a fall in the serum potassium to 14 mg. per 100 ml. These figures show sodium and chloride retention. Oliguria persisted for a further three days, his oedema became worse, and his general condition deteriorated still further. Intake of fluids meanwhile was 2-3 litres a day. Urea, 60 g. a day, was then given as a diuretic for three consecutive days, and produced a good response. The urine output increased to 3 litres a day and the oedema lessened. The blood electrolytes fell to normal limits.

With the return of his blood chemistry to normal, his condition began to improve steadily; his temperature settled and the antibiotic dosage was reduced. Nine days after the second operation testosterone and thyroid were started, while the A.C.T.H. was gradually reduced in dosage each day, being finally discontinued two weeks later. During the following month his fluid and electrolyte balance remained satisfactory with a normal diet, and blood electrolyte estimations from time to time showed normal figures. Testosterone and D.C.A. were continued, but he remained lethargic and rather uncooperative in spite of his hormone treatment. Cortisone was not available.

Discussion

In this case A.C.T.H. substitution therapy appeared to be successful in tiding the patient over the stress of the operation on the pituitary cyst. After cessation of the treatment he slowly lapsed into the form of stupor characteristic of "endocrine failure." This was accompanied by a fall of blood pressure and loss of body sodium and chloride; in fact, a high concentration of chloride in the urine together with a normal fluid excretion had been observed during the period before the collapse, but the significance of this was not then recognized. Daily estimations of the amount of salt excreted therefore appear to be important in such a case.

Concurrently with his deterioration the patient developed a hemiparesis of the side opposite to that of the surgical approach. Focal epileptic attacks followed. These phenomena may have been due to local thrombosis, but it is strange that they improved so suddenly once the electrolyte balance was restored and A.C.T.H. recommenced.

Re-exploration of the operation field did not reveal adequate cause for the late deterioration, and failed to produce an immediate improvement. The level of consciousness and the blood pressure improved after the replacement of body salt and the administration of A.C.T.H.

The second relapse was associated with elevation of plasma sodium and chloride, oedema, and respiratory infection. This responded to restriction of salt and the use of a diuretic and antibiotics.

An abnormal water and electrolyte metabolism is often found in hypopituitarism, and is essentially similar to that occurring in Addison's disease and in adrenalectomized animals; there is failure of normal water diuresis, deficiency of sodium and chloride, and accumulation of potassium in the body. These features were present in the case described. Although the secretion of the electrolyte-regulating hormones of the adrenal cortex is not under the influence of the anterior pituitary to the extent, for example, of the hormones controlling carbohydrate and protein metabolism, in the absence of the adenohypophysis the adrenal cortex is unable to regulate the reabsorption of electrolytes by the renal tubules so as to preserve the constancy of the internal environment when confronted by physiological changes, variations in diet, and stress (Sayers, 1951). An interesting feature is that throughout the period of observation of this patient in hospital before and after operation, and also while he was being given A.C.T.H., most of his urine was passed at night, a reversal of the normal diurnal rhythm. This is in keeping with previous observations in hypopituitarism (Robertson, 1951).

Summary

A case of hypopituitarism due to a pituitary cyst is described in which A.C.T.H. was given before and after operation.

Several days after cessation of treatment with A.C.T.H. the development of hemiparesis, epileptic attacks, and stupor was associated with sodium and chloride depletion.

Rapid improvement followed correction of the electrolyte depletion and resumption of A.C.T.H. therapy.

Onset of respiratory infection and oedema, with sodium and chloride retention, was associated with a relapse. This was relieved with antibiotics and induction of a diuresis.

The pituitary-adrenal relationship is discussed.

It is concluded that constant attention to electrolyte balance is important in the management of such a case.

I am grateful to Mr. D. G. Phillips for permission to publish this paper and for help and encouragement in its preparation. My thanks are due to Mr. W. B. Yeoman for many of the laboratory investigations.

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MYOCARDIAL CALCIFICATION ASSOCIATED WITH PITUITARY ADENOMA AND OBESITY

BY

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Myocardial calcification without evidence of extensive tuberculous, rheumatic, or ischaemic heart disease is not common, and few cases have been reported. In the following case the gross obesity and large pituitary tumour add to the interest.

Clinical History

A woman aged 64 was admitted to hospital on a Saturday afternoon and died 36 hours later, before radiological or pathological investigations could be undertaken. Owing to her poor mental state an accurate history was out of the question, but her relatives said that her legs had been swollen for some 30 years and that more recently she had been short of breath. Nevertheless, in spite of her increasing disability—she had virtually been confined to bed for two years—she had refused to allow her doctor to see her. She had not had diphtheria or tuberculosis, nor had she been abroad. There was a family history of obesity, both parents and three siblings being overweight, and two of these had died of heart failure.

Examination was made difficult on account of her vast size and rather bovine mentality. Her weight was estimated

at 23-25 st. (146-159 kg.) and her obesity was generalized. However, her legs appeared to be the most affected. The skin on her legs was hard and irregular, with gross hyperkeratosis and some hard pitting oedema, somewhat resembling elephantiasis at first sight (Fig. 1).

On examination the pulse rate was 100, regular, and of fair volume, and the blood pressure was 160/120 mm. Hg.

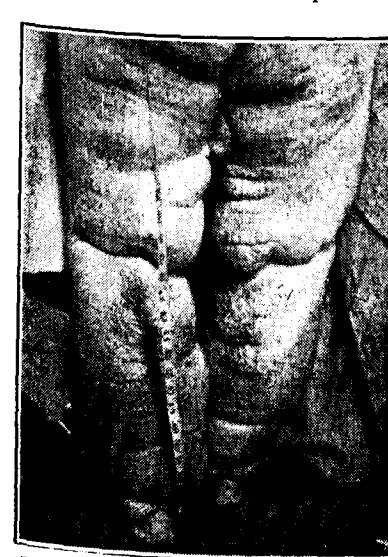


Fig. 1.—Pseudo-elephantiasis and proci-dentia.

The heart sounds were of fair volume and seemed normal, although there was a harsh apical systolic bruit. Both lung bases were very congested. Complete proci-dentia was present, and there were many intertriginous areas in the groins and buttocks; the axillary and pubic hair was scanty. Unfortunately the optic fundi and visual fields were not examined on admission, as the pituitary adenoma was unsuspected. Digitalis folium, 1 gr. (65 mg.) twice daily, mersalyl, and a reducing diet were prescribed. While in hospital the patient appeared to suffer from polyuria. She was not able to do very much for herself, partly on account of her size; she was therefore nursed on a mattress on the floor, as her weight was such that the combined efforts of four nurses were necessary to move her. She died rather suddenly for no apparent reason during her second night in hospital.

Post-mortem Examination

Her height was 5 ft. 3½ in. (161 cm.) and her weight 26 st. 4 lb. (167 kg.). A smooth firm solid adenoma of the pituitary was found in a deep and wide pituitary fossa measuring ½ by 1 in. (1.9 by 2.5 cm.); the tumour weighed 4.1 g. (normal weight about 0.5 g.), and was closely attached

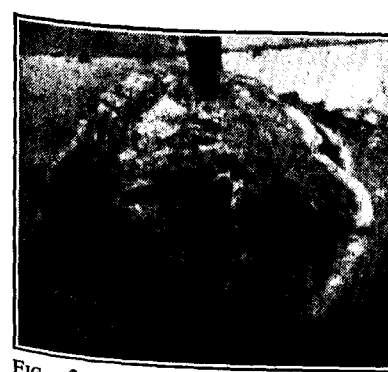


Fig. 2.—Myocardial calcification and caseation.

to the left optic nerve and internal carotid artery and had indented the hypothalamus. The cerebral arteries showed advanced atheroma without evidence of thrombosis. Several nodules about the size of a pea were found in the space behind the posterior lobes of the thyroid and in the superior mediastinum, but none of them contained parathyroid tissue and they showed only lymphatic tissue on sectioning. The thyroid, ovaries, adrenals, kidneys, and gastro-intestinal tract were macroscopically and microscopically normal. The lungs showed no evidence of new or old tuberculous infiltration, there was no apical fibrosis or calcification, and pleural adhesions were absent. The spleen was congested but normal histologically and weighed 450 g.; the liver weighed 2,150 g.

and was of normal texture, with no fatty degeneration histologically. The gall-bladder contained a large cholesterol stone.

The heart weighed 950 g. when stripped of the very abundant surrounding fat. The pericardium was normal in colour and thickness, and there was very little pericardial fluid. The coronary arteries were patent throughout with only minimal atheroma, and their openings into the aorta were not stenosed. There was moderate aortic atheroma. The heart valves were all normal, with no fibrotic thickening or calcification, and the chordae tendineae were not shortened or thickened. On sectioning the ventricles three or four large calcific masses (½ by ¼ in.—1.3 by 1.9 cm.—in diameter) with central areas of white caseous material (Fig. 2) were cut across with difficulty. Stained films of this caseous matter revealed no acid-fast bacilli. The calcareous masses extended from behind one of the mitral valve cusps (but not continuous with it) about 2 in. (5 cm.) downwards in the interventricular and left ventricular walls; the masses were quite separate from each other and from the pericardium and epicardium. The myocardium between these masses looked healthy and was not fatty. Prolonged search was made for areas of calcification in other organs, especially the kidneys, lungs, and stomach, but no other calcified foci were found. The long bones were not examined, although the skull seemed normal.

The histology of the pituitary adenoma was reported on as "lightly staining cells forming a poorly organized tumour of the chromophobe type." The heart contained "caseous lesions in the myocardium into which extensive calcareous deposits have been laid down; there is a foreign body reaction around these calcified lesions with occasional foreign body giant cells, but no sign of a reaction suggestive of a specific granuloma."

After the necropsy the husband was interviewed, and in response to specific questions said his wife had had polyuria and polydipsia for three to four years. Her eyesight had been failing for the past two years; and for the past three months she had had severe frontal headaches and had been drowsy in the daytime but wakeful at night. She had always been rather obese but had put on much weight since the age of 35. About a week previously he thought she had coughed up a little blood. Her periods had ceased at the age of 59. She had had no previous illnesses except "bronchitis."

I wish to thank the Director-General, R.A.M.C., and Dr. R. B. Niven, under whose care the patient was admitted, for permission to publish this case record. I am grateful to Dr. T. B. Dunn, senior medical registrar, for his invaluable advice and criticism in the preparation of this report; to Dr. J. Spencer, pathologist, for the histological report; and to Lieutenant-Colonel J. B. Neal, for office facilities.

All surgical operations likely to cause pain to animals must be carried out under an anaesthetic according to the Protection of Animals (Amendment) Bill published on July 30. The effect of the Bill, which was formally introduced as a private member's Bill by Lord Stamp, is to repeal the Animals (Anaesthetics) Act, 1919, an extends the scope of the Protection of Animals Acts, 1911 to 1933. The Bill does not apply to operations performed on birds, fowls, fish, or reptiles. It covers "any operation with or without the use of instruments which involves any surgical interference with the sensitive tissues or the bone structure of an animal." Operations excluded from this ruling include any experiment to which the Cruelty to Animals Act, 1876, applies; first aid in emergencies; docking dogs' tails before their eyes are open; castrating domestic animals before they reach the prescribed age; and any minor operation which, because it is quick or painless, is not normally performed by a veterinary surgeon. The Bill is being put forward because of the great advances in the development of anaesthetics since the 1919 Act was passed.

HOP DERMATITIS IN HEREFORDSHIRE

BY

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The object of this investigation was to try to discover the incidence of hop dermatitis among workers in the hop-yards in Herefordshire and also try to establish the cause and nature of the dermatitis.

The use of hops for flavouring and preserving beer was known long before 1549, when it is thought hops were first cultivated for this purpose on any large scale in England. For a time in the sixteenth century hops were regarded as noxious and their use was forbidden. Hereford City Regulations, 1557 (Morgan, 1945), has the following entry: "And that no bruer shall sett Anye hoppes or asshes in theire Ale upon peyne of XXs for evy defalte." Hereford people, however, thought the risk of this "peyne" worth taking, as in 1513 the following culprits were brought before the jury at Views of Frankpledge: "Wyllm Collyer for bere Hoppis in ye ale, Alson Coke for bere hoppis in hyr ale," with a number of other citizens. It can be assumed therefore that Hereford people have been picking hops at least since the early sixteenth century.

In the county "hop rash" is well known by all hop-workers. It is thought to vary in incidence from year to year in relation to the weather and to be fairly common among pickers but rare among other hop-workers. Hop rash is usually assumed by pickers to be caused by the hop-washes.

History of Hop Dermatitis

In 1924 O'Donovan described two cases of acute contact dermatitis on exposed surfaces developing in two girls after visits to the hop-gardens of Kent. He says that, in spite of the annual exodus of Londoners to the hop-gardens, the dermatitis had not been seen previously at the London Hospital, and suggests that this is because the condition is rare, that hop-picking is a holiday, and that people who develop dermatitis do not again go hop-picking. O'Donovan quotes Samuel Dale, who in 1693 wrote on hops: "De Lupulo Salictario—Extrinsicus sedebat dolores," and Badham, who in 1834 described the case of a girl of 14 who developed dermatitis of the hands and face after placing her hands in a bin of hops to warm them.

Lewith (1928) did patch tests with hop-cones on three cases in female hop-pickers, with positive results. His attempt to reactivate the dermatitis by giving lupulin, a hop extract, by mouth failed. He thought there was no doubt that the dermatitis was due to contact with the hop-cones. Smithies (1929) saw 52 cases of hop dermatitis among 1,172 patients attending a clinic for hop-pickers. She quotes the observation of Galbraith (1924) that a number of cases of hop dermatitis appeared in a year when no washes were used, and also points out that the regular garden workers who use the washes most do not suffer from the condition. She suggests that a protein sensitization from inoculation of hop juices or pollen through scratches from the spines on the hop-bines may be the cause. Schwartz *et al.* (1947) state that hop dermatitis is often accompanied by conjunctivitis, but have nothing further to say about the cause of the dermatitis.

Incidence in Herefordshire in 1952

In the previous four years only one case of hop dermatitis had been referred to the dermatological out-patient department in Hereford. The district nurses and medical practitioners working in the hop-picking areas were therefore asked to report cases of hop dermatitis to the dermatologist. As it was thought that this method would miss most of the mild cases, at one hop-yard employing 450 pickers the bushelling clerk, a V.A.D. nurse, who saw all the pickers at work every day, sought out and reported every case.

As dermatitis is almost unknown except at hop-picking time, the investigation started with the picking season on September 4, 1952, and continued until the end of picking on October 7. The first case was reported on September 13, the last on October 4. The estimated number of adults regularly employed in hop-picking in Herefordshire in 1952 was 30,000 (G. P. Chater, 1952, personal communication). This does not include an unknown number of people who visit their friends and relations in the hop-yards for short periods of perhaps half a day. These people make an accurate estimate of the incidence of dermatitis impossible.

Twenty-two cases were reported to the dermatologist and were classified as follows:

Severe: forced to give up picking 11
Moderate: carried on picking, rash persisted but cleared when picking stopped 5
Mild: carried on, rash cleared before the end of picking 6

Apart from the difficulty of casual pickers, this total does not give a true picture of the real incidence of hop dermatitis for the following reasons: (1) Hop-picking is a pleasant and lucrative occupation; pickers will not give up before the end of the short season unless forced to do so by the severity of their dermatitis. (2) Many cases are mild and even transitory, the cause is known, and recovery is certain when picking stops, therefore pickers do not seek medical help even in 1952. However, the 11 severe cases may be a fairly accurate figure for the incidence of this type of case among the 30,000 (plus) pickers in 1952, as such cases would have been forced to seek medical help. The most that can be said, therefore, is that in Herefordshire in 1952 severe dermatitis was uncommon, about one case in 3,000 pickers.

Some idea of the incidence of all types of hop dermatitis can be obtained from the figures supplied by the V.A.D. nurse working in a hop-yard employing 450 pickers. She reported 12 cases: six were of a mild transient type and were not seen by the dermatologist; six were seen—one severe, two moderate, and three mild. From this report, so far as it goes, it seems possible that a mild dermatitis was fairly common in Herefordshire in 1952, about one picker in 30 being affected.

Clinical Findings

Unlike most cases of contact dermatitis seen in out-patients, the history in these cases could be obtained fairly accurately, and the dermatitis appeared in healthy cheerful people bent on a lucrative holiday and not bedevilled by thought of compensation. The dermatitis was therefore seen in an unusually clear field.

Of the 22 cases reported, 17 were seen personally—of whom 12 were given patch tests—three were seen by other doctors, and two were not seen. The patients came from 11 hop-fields situated in all the different hop-growing areas in Herefordshire. There were five men and 17 women. This is of no significance, since there are many more female than male pickers. At one farm, for example, there were 410 women and only 40 men. The ages range from 15 to 71. This agrees with the usual finding that contact dermatitis is rare among children. Apart from two cases in sisters, no family history of hop dermatitis was dis-

covered. Two patients gave a history of contact dermatitis to other irritants. There was no obvious evidence of psychological stress and strain, patients compared favourably with the average run of dermatological patients in this regard. No one wanted to give up picking, in fact the patients were upset if they were forced to do so, and the cry of compensation was not heard once.

Socially patients varied from the poorest caravan dwellers to undergraduates. Secondary infection of the dermatitis was seen in only two cases. The dermatitis was papular and oedematous rather than weeping, and this would help to prevent secondary infection.

The following case histories illustrate typical hop dermatitis.

Severe Dermatitis.—A healthy housewife aged 29 had no previous history of skin trouble other than dermatitis due to hops. She was born in Herefordshire, but lived away and was visiting the county for the hop-picking. Her mother had picked hops during many seasons without trouble. The patient had often been in hopyards for odd days as a child, but had had no sign of dermatitis until the age of 21, when after picking hops for one afternoon she developed a rash on her face, arms, and legs which lasted for three days. She had not visited a hop-yard again until 1952. She started picking on September 10, and by the evening felt a rash under the skin of her face. She picked again on the following afternoon, but the rash became worse and she did not pick again. When seen on September 13 she had gross oedema of eyelids, nose, and lips, with erythema, and an itchy papular eruption on the face, between the fingers, and on the dorsum of the hands, extending up the flexor surface of the forearms to the elbows. Antihistamines by mouth and sedative applications were prescribed. By September 15 the condition was beginning to settle down, and by the 22nd the oedema had subsided completely, the skin was peeling, and there was a slight vesicular eruption on the fingers which disappeared during the next seven days. Patch tests to hop-cone on September 22 and October 25 were strongly positive.

Moderate Dermatitis.—A healthy male undergraduate with no previous history of skin trouble was working as a busheller. He plunged his right arm with the bushel measure into the picker's crib of hops and helped the hops into the measure with his left hand. He started work on September 4, having never previously seen a hop. After eight full days of bushelling he developed an irritable papular eruption on the back of his hands and the flexor surface of his forearms, corresponding fairly accurately to the site of staining from the hop juices. He carried on with his work and the dermatitis was little different when he was seen 10 days later. He then had a slight erythema round his eyes and at the side of his nose. A patch test to hop-cone on his back was strongly positive. He was treated similarly to the previous case and went on with his work until October 3 without much discomfort. On October 6 his skin was almost clear.

Mild Dermatitis.—A healthy female publican aged 45, with no previous history of skin trouble, had been in the hop-yards every year since the age of 1. Her mother had also picked hops for many seasons without trouble. She started picking on September 4, and 11 picking days later developed an oval erythematous area with itchy papules on the dorsum of her right forearm and erythema and slight swelling round the eyes. This persisted for five days and disappeared, in spite of continued picking, without treatment. The site of the eruption on the forearm was the same as a painful area due to tenosynovitis or hop gout. No embrocation had been used, but she had rubbed the area with hop-stained fingers. A patch test to hop-cone was negative on a day when the rash had recovered.

The degree of severity and the number of days picking before the development of dermatitis in 18 cases classified according to their previous history of hop dermatitis or of contact with hops is summarized in Table I. From these results it seems that hop dermatitis is a true sensitization

dermatitis, in that the skin has to be previously exposed to the sensitizing agent and the dermatitis recovers when this is removed (Hellier, 1950).

Cases with a previous history of dermatitis all developed an attack within 48 hours of exposure in the hop-yard. In new cases length of exposure varied widely and did not seem to depend on the type of the subsequent attack. As is usual in contact dermatitis, there seemed to be no reason why these particular individuals should be sensitive to hops.

Prognosis could also be assessed and was in accordance with the view of Hellier (1950) that hardening in contact

TABLE I

Case No.	Previous History of		No Contact Except "Stripping"	Type of Dermatitis
	Dermatitis	Picking		
1	1 day			Severe
2	1 "			"
3	2 days			Moderate
4	1 day			Severe
5	1 "			Moderate
6	Not known			Severe
7	" "			Moderate
8	" "	1 day		Mild
9	" "	2 days		"
10	" "	4 "		Severe
11	" "	14 "		Mild
12	" "	9 "		"
13	" "	13 "		"
14	" "	11 "		"
15	" "		8 days	Moderate
16	" "		10 "	Severe
17	" "		17 "	"
18	" "		10 "	"

dermatitis, as described by Schwartz *et al.* (1947), occurs only in mild cases, while the more severe ones become progressively worse with each exposure.

Apart from the mild cases which recovered during this season, a case of hardening was found in the sister of one of the cases. This woman had picked for three seasons without trouble, but developed moderate dermatitis during her fourth season, mild dermatitis during her fifth season, and this season had picked free of trouble again. One case of moderate severity seen two months after the end of the season still had a chronic eczema of the hands at the site of previous dermatitis. This result may be an alternative to hardening in some patients.

Daily weather reports were obtained from the county observatory to try to correlate the development of new cases with periods of sunshine. This was not possible, but it is probable that the weather over the whole picking season may affect the incidence of dermatitis. September, 1952, was the coldest in Herefordshire for 80 years, the mean daily maximum temperature of 59° F. (15° C.) being without precedent (F. G. Parsons, 1952, personal communication). This may account for the low incidence of severe dermatitis this year. It is hoped to study weather influence in subsequent years.

Possible Causative Factors

To discover the cause of hop dermatitis a search was made for a sensitizing agent. Three possibilities were explored.

(1) **Insecticides and Other Washes.**—The evidence against these is as follows. First, hop dermatitis was described by Badham in 1834. Sulphur was first used as an insecticide for hops in about 1850 (Parker, 1934). All other insecticides were introduced later. Secondly, hop dermatitis is almost unknown among cultivators. One case which was thought to be due to hop pollen was reported by Dr. J. C. Taylor, of Goudhurst. The number at risk must here be taken into account. For example, on a first-class Herefordshire hop-farm employing more than 450 pickers, only 23 people are employed regularly in cultivation, with an additional 15 at hop-tying. Hop-pickers would come into contact with sprays if these were present on hop-cones. The fate of the following sprays was therefore investigated:

(1) Nicotine : this evaporates (A. H. Burgess, 1952, personal communication). (2) Sulphur : this may remain on hops until they are dried in kilns, when it is usually driven off (Burgess, 1952). (3) Bordeaux mixture : correctly applied the hops should be free of copper at picking (Lloyd Hind, 1948). (4) Pestox : contamination with organo-phosphorus compounds may be fatal in a few days (Barnes and Davies, 1951)—these are applied according to regulation to prevent contamination. Sulphur, therefore, is the only one of these insecticides which need be considered.

(2) *Insects on Hops*.—At least 11 caterpillars are found on hops (Theobald, 1925). Of these the caterpillars of the pale tussock-moth, or hop-dog, the vapourer moth, and the dock-moth are hairy and in the caterpillar stage in September. Hop dermatitis often starts on the face, but never round the neck, which is the usual site for caterpillar dermatitis. "Hop-fleas" are present and bite the legs of pickers. The spots caused by these are distinguished easily from dermatitis by the pickers.

(3) *Hop-cones*.—These are the female inflorescence of the dioecious hop-plant and ripen in early September, when they are aromatic and sticky with resin. The aroma is due to hop-oil and the pickers are in contact with this in the atmosphere and also have it on their hands mixed with hop-resin. In view of the importance of hops in the brewing industry, much work has been done on hop-oil and hop-resin, so that in addition to patch tests with hops it was possible to use the different hop products as well. The content of these oils and resins is at a maximum when the cones are ripe in September. The bines are pulled down from the wires and the cones picked off one by one. A good picker can pick up to 20 bushels in a day, and picks for about 30 days each season, from 7 a.m. to 4 p.m. The contact with the hops is therefore a concentrated one.

Results of Patch Tests

Hop-cone.—The cone was bisected and the cut surface applied to the skin away from the site of dermatitis under lint, jaconet, and strapping for 48 hours. A control test, omitting the cone, was used. Severe cases were not tested until the dermatitis had subsided. The results (see Table II) were :

Cultivated hops possibly contaminated with sulphur: eight tested—six positive, one doubtful, one negative.

Escape hops from bine on telegraph pole, no possibility of contamination with sulphur: five tested, all positive.

Controls: 12 used, all negative.

The doubtful and negative tests occurred in patients whose dermatitis had recovered, although picking continued, before the test was read. Oedema was severe around the erythematous positive patch test. From this it seems highly likely that the hop-cone itself is the cause of the dermatitis. In order to exclude contamination with caterpillar hairs and to try to pin down the sensitizing agent, further patch tests were done using hop-oils and hop-resins. The oil would be present on the face and hands; the resin would be on the hands and brought to the face by the fingers.

Soft Resin, Total Resin, Humulone, Lupulone.—These were prepared by Messrs. Bencard. Appropriate control tests were made from material supplied by the Brewery Research Association. Nine patients were tested, all of whom had previously given positive results to hop-cone. Two were positive to all four tests; one was positive to soft resin and total resin; and six patients negative to all four tests.

Hop-Oil.—This was obtained from three sources. *Oil A* (from Messrs. Bencard) on prepared patch tests. This oil was known to be one year old. The nine patients tested were all positive to hop-cone; eight were negative and one was positive to hop-oil. *Oil B* (from Cheltenham Brewery). This also was an old oil. It was applied on lint under jaconet and strapping. Two patients were tested, one was positive and one was negative. The positive patient was one of those who gave positive results with the four resin patch tests. *Oil C* (from Messrs. White, Tomkins, and

Courage) was freshly distilled oil from fresh green hops and was applied on lint as above. Seven patients were tested, six were positive and one was doubtful, possibly due to evaporation of oil before test could be used. Two of these positive patients gave positive results with some or all of the resin patch tests.

TABLE II.—Results of Patch Tests

Case No.	Hop-cone		Resins				Hop Oils		
	Cultivated	Escape	Soft Resin	Total Resin	Humulone	Lupulone	Old A	B	Fresh C
1	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+

Discussion of Results of Patch Tests

Where accurate histories could be obtained it was found that dermatitis started on the face in seven patients, and in three of these the hands were not affected. In three patients the dermatitis started on the hands and spread to the face. In view of this, and the probable variation in incidence with the weather, a volatile agent seemed likely. Hop-oil is such an agent, as it consists of a mixture of essential oils. Fresh hop-oil is known to differ from old oil in that it contains 40% myrcene which is oxidized and disappears in old oil (Lloyd Hind, 1948). From the patch tests it seems possible that myrcene might be one of the sensitizing agents responsible for hop dermatitis. If the sensitizing agent is in fresh hop-oil, it seems surprising that kiln workers do not commonly develop dermatitis. Again the number at risk has to be considered—10 kiln workers in proportion to 450 pickers. In the kilns, also, the fresh hops are not handled by the workers but spread with flat shovels. The hops awaiting drying are kept in sacks and on the drying racks; some of the oil myrcene is lost in the air current used in drying (A. H. Burgess, 1952, personal communication).

If dry hops contain little myrcene they may be less likely to cause dermatitis, as seems to be the case both in breweries (R. Webb, 1952, personal communication) and in the hop-markets. The commercial manager at the Hop Marketing Board (Mr. F. H. Job) gave the following interesting information. Among about 250 people employed he has heard of only one case. These people are constantly taking samples from the pockets of dry hops and testing them by rubbing between the palms, which are then put up to the nose to obtain the full aroma. It seems highly likely, therefore, that the sensitizing agent has been removed in the drying, otherwise cases of dermatitis might be expected frequently among the samplers.

Unfortunately this explanation does not cover the patients who gave positive patch tests to resins. The fact that they were positive to all four tests in two cases might be explained if the substances provided for the tests were not absolutely pure. There is probably no chemical relationship between the constituents of the oil and those of the resins (A. P. Tatchell, 1952, personal communication). The two patients who gave positive patch tests to both fresh hop-oil and resins had severe dermatitis, two of them with rapid development of acute oedema and erythema after a short contact. The patch tests were not part of a general sensitivity, however, as the controls were negative and the tests did not reactivate the dermatitis which had subsided.

It is possible that two sensitizing agents are involved, with fresh hop-oil as the more usual one. On the other hand, the explanation may lie in further elucidation of the chemistry of the hop-cone.

Summary

Hop dermatitis in Herefordshire was studied during the 1952 picking season, which was regarded as a light season for dermatitis.

Accurate estimation of the incidence of dermatitis was impossible, but it was thought that most of the severe cases were seen. The incidence of this type of case in Herefordshire in 1952 was found to be about 1 case in 3,000 pickers.

Daily observations of 450 pickers showed a much higher incidence of mild dermatitis: approximately 1 in 30 of these pickers developed some type of dermatitis.

It therefore seems probable that, while severe cases are rare, mild cases may be fairly common.

Hop dermatitis in some cases tested seemed to be due to a sensitivity to fresh hop-oil, of which myrcene may be the active ingredient. In three cases sensitivity to hop resins was also present. No satisfactory explanation of this is forthcoming at present.

It is suggested that the rarity of hop dermatitis among workers in dried hops is due to the fact that the sensitizing agent is driven off in the drying process. It is concluded that this is just as well, in order that the use of hops may continue. Harrison's words in his *Description of England* in 1577 are still true in 1952: "For if your Ale may endure a fortnight your Beere through the benefice of the hop shall continue a month, and what grace it yieldeth to the taste all men may judge that have sense in them."

We thank the medical practitioners and district nurses of Herefordshire who sent us the patients, and particularly the patients themselves, who were most helpful about patch testing. We also thank Dr. A. H. Burgess, head of hop research, Wye College; Mr. R. Webb, of Cheltenham and Hereford Brewery; Mr. Milner, of Messrs. Bencard; Dr. Bernard Tate; and the Davies family, of Claston, Herefordshire, for much help.

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The joint committee set up in 1946 by the National Institute for the Blind and the London County Council to advise on the use of optical aids for the partially sighted has now published its report (*N.I.B. Bulletin No. 19*). The search for a good magnifying lens capable of covering an entire printed page has resulted in the production of special binoculars which fit over the nose. Various types of desk lenses are also described and illustrated. Another method advocated is the projection on to a screen of micro-filmed books, newspapers, etc.; the advantage of books on micro-film over other aids is that greater magnification can be obtained without loss of contrast and with no distortion. Suitable projectors cost about £20. Tests on partially sighted children show that in some cases the use of contrasting colours, such as blue chalk on yellow board, improved the visual impact of reading and writing. At one school a preference for black crayon on white paper was expressed. The report may be obtained from the National Institute for the Blind, 224, Great Portland Street, London, W.1.

RAPID METHOD FOR DETECTION OF BARBITURATES IN URINE AND STOMACH CONTENTS

BY

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Treatment of barbiturate poisoning by analeptics is not without danger, and a rapid method for the detection of barbiturates in urine and stomach contents is of value in doubtful cases. Several "rapid" methods (Griffon and Le Breton, 1938; Denis and Lambrechts, 1940; Merley, 1948; Goldbach and Opfer-Schaum, 1949; Selwyn and Dark, 1950) have been described for detecting barbiturates in urine, but the procedures take from one to three hours.

A micromethod for the detection of barbiturates in urine, cerebrospinal fluid, and blood has been described by Kresbach and Gomahr (1951), and a modification of this method, making it less sensitive but more rapid, has been used for the detection of barbiturates in urine and stomach contents.

Principle of the Method

The acidified urine or stomach washings are extracted with chloroform. This is carried out in one stage, and the volume of chloroform is kept small so that the time required for evaporation is not excessive. Chloroform is used in preference to ether because of the inflammatory nature of the latter. The chloroform extract is dried and decolorized. Activated charcoal is used for decolorization because, although it absorbs some of the barbiturate, it is more effective than any other agent and the loss of some of the barbiturates is not serious. The chloroform extract is evaporated to dryness and the presence of barbiturate in the residue is tested for by its reaction with cobalt nitrate and ammonia vapour.

Reagents Required.—Chloroform; dilute sulphuric acid (approximately 10% w/w); sodium sulphate (anhydrous); a mixture of activated charcoal 3 parts and magnesium oxide 1 part; cobalt nitrate 1% w/v in absolute methyl alcohol; and ammonia solution (S.G. 880).

Procedure

About 50 ml. of urine or stomach contents are acidified with 4 ml. of dilute sulphuric acid and shaken with 20 ml. of chloroform in a separating funnel for one minute. Stomach contents should be strained to remove solid material, although any portions of tablets or capsules which are present should be included in the sample.

After allowing the chloroform emulsion to settle out, the chloroform layer is run off into a 250-ml. conical flask. Enough anhydrous sodium sulphate (5–10 g.) is added to dry the chloroform emulsion, so that, after shaking, the sodium sulphate separates out from the clear or slightly opalescent chloroform. About 0.5 g. of the activated charcoal mixture is added, the resultant mixture being shaken and filtered through a No. 43 Whatman paper into a 100-ml. beaker. The filtrate should be crystal clear. The filtrate is then evaporated to dryness on a boiling water-bath. Towards the end of the process the beaker is tilted so that the final residue is confined to a small area of the beaker.

The residue is rubbed off the bottom of the beaker, using a small piece of filter paper fastened over the rounded end of a glass rod so that most of the residue, which is of a pale yellow colour, is concentrated on an area about 2 mm. in diameter in the centre of the paper. The paper is then removed from the glass rod, flattened out, and a drop of

the 1% cobalt nitrate solution is added to the residue. This is dried by warming over a flame and then the paper is exposed to ammonia fumes by holding it over the mouth of a bottle containing strong ammonia solution. A positive reaction is shown by the development of a reddish-violet colour in the region of the residue. The colour is best seen by transmitted light.

Weak reactions may sometimes be intensified by adding another drop of cobalt nitrate solution. The colour given by a strong positive reaction is fairly stable, but a weak positive reaction tends to fade after a few minutes.

The time required for carrying out this procedure is less than 15 minutes.

Results

Tests were carried out on solutions of the common barbiturate derivatives in urine. The solutions were made up from powder or from the commercial tablets; the derivatives used, together with the results obtained, are shown in the Table.

Results of Tests

Barbiturate Derivative	Concentration per 100 ml. of Urine		
	2 mg.	1 mg.	0.5 mg.
Soluble barbitone ..	++	—	—
phenobarbitone ..	++	++	—
Amylobarbitone sodium ..	++	++	+
Quinalbarbitone ..	++	+	—
Butobarbitone ..	++	++	+
Pentobarbitone ..	++	+	—
"Allonal" ..	++	++	+

++ = Positive. + = Weak positive.

The use of a larger volume of urine made weak positive reactions rather stronger, but strong positive reactions were not appreciably affected. The urine of patients having therapeutic doses of barbiturate derivatives were also tested. The urine of patients having barbitone or soluble barbitone (0.3–0.6 g. daily) gave a positive reaction in every case, the urine of patients having phenobarbitone (0.03 g. thrice daily) gave a weak positive reaction in four specimens out of ten tested. The shorter acting barbiturates could not be detected in the urine of patients receiving therapeutic doses. In none of the barbiturate-free urines tested was a false positive reaction obtained.

Comment

From the point of view of detection the barbiturate derivatives can be divided into two main groups. First, the "long-acting" barbiturates such as barbitone and phenobarbitone, which are excreted in the urine in considerable quantities and can be easily detected even after therapeutic doses; and, secondly, the "short-acting" barbiturates, which are for the most part metabolized and are excreted in the urine in small quantities only.

If poisoning is due to one of the longer-acting barbiturates it should be easily detectable in the urine. The shorter-acting barbiturates, even though producing coma, will probably not be excreted in the urine in sufficient quantities to give a positive reaction with a rapid method of detection such as is described here, and in these cases the barbiturate is more likely to be detected in stomach washings.

The first 500–1,000 ml. of stomach washings should be saved separately for detection of barbiturates. If these first washings are diluted with the rest of the water required for complete stomach washout, then the subsequent detection of barbiturate is more difficult.

Summary

In cases of suspected barbiturate poisoning it is of value to confirm the presence of barbiturates in urine or stomach contents before treatment is begun.

A method is described whereby barbiturates can be detected in concentrations of the order of 1–2 mg. per 100 ml. of urine. The time required for performing the test is less than 15 minutes.

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Medical Memorandum

Peripheral Neuritis Following Tetraethylthiuram Disulphide Treatment

Tetraethylthiuram disulphide ("antabuse") has been in use since 1948 for the treatment of alcoholism. No case of peripheral neuritis has been fully reported, although three cases were mentioned as occurring among 120 alcoholics treated with the drug (Child *et al.*, 1951).

CASE REPORT

A man aged 40 had been drinking since the age of 16. His job as a waiter gave him ample opportunity to indulge, and so by 1948 he was consuming two bottles of gin a day. This state of affairs continued until his admission in July, 1952. The medical history was negative apart from gonorrhoea at the age of 21. Examination showed him to be a small man with an aggressive, mildly hostile, and suspicious manner. No physical abnormality was detected; the blood pressure was 146/94. His intelligence was a good average, there being no sign of intellectual impairment. The blood Wassermann reaction was negative and the sedimentation rate normal. Van den Bergh and thymol turbidity tests were negative. Plasma proteins were normal.

On August 8 he was given 1.5 g. of tetraethylthiuram disulphide; this was followed by 0.5 g. daily. An alcohol/tetraethylthiuram-disulphide test reaction was carried out six days later without any untoward effect, and the patient left hospital on October 15, continuing to take the drug and remaining abstinent. At the end of November he noticed tingling sensations in his toes, with numbness, which progressed to involve the anterior third of the feet. Examination revealed a loss of sensation to light touch, pin-prick, and vibration over the anterior third of both feet, together with some diminution in the ankle-jerks. He had to give up his work because of the symptoms. On December 18 he stopped taking the drug because he felt it might have been responsible for his symptoms, since when there has been a gradual improvement in his condition.

COMMENT

Although the development of peripheral neuritis in alcoholics is to be expected, the development of the condition in this case seems to have followed 16 weeks' treatment with tetraethylthiuram disulphide while the patient was abstinent. During his stay in hospital his nutritional intake was good and he gained 10 lb. (4.5 kg.) in weight.

Tetraethylthiuram disulphide can lead to a variety of toxic symptoms, chiefly tiredness, headache, and mild ataxia. Electroencephalographic changes have been reported (Guild and Epstein, 1951). Several authors describe toxic confusional states following its use (Bennett *et al.*, 1951; Guild and Epstein, 1951; Martensen-Larsen, 1951). Such reports would indicate that considerable caution should be exercised in giving tetraethylthiuram disulphide over long periods of time, for it seems possible that the nutritional deficiencies occurring in alcoholics may increase the susceptibility of these patients to the toxic effects of the drug.

My thanks are due to Dr. D. L. Davies, physician, Bethlem Royal and Maudsley Hospitals, for permission to publish this case.

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Reviews

TREATISE ON OTOLARYNGOLOGY

Diseases of the Throat, Nose, and Ear. Edited by F. W. Watkyn-Thomas. (Pp. 880; 367 illustrations (including 22 coloured plates). £5 10s.) London: H. K. Lewis. 1953.

In a sense this work is based on Herbert Tilley's textbook of 30 years ago, but, as the editor points out in the preface, "the whole outlook in the field has changed beyond recognition." So that, though some of Tilley's observations still stand, the whole book has had to be rewritten and brought up to date; further, a section on the ear has been added. So good are all the articles that scarcely any criticism can be found.

The book is in five parts. The first is novel in that it describes special methods of treatment, plastic surgery, fractured nose, and physiotherapy. The last section includes a clear description of the system of exercises introduced by Cooksey to overcome post-operative vertigo.

The second part is devoted to the larynx, hypopharynx, trachea, oesophagus, and endoscopy. It is all sound and practical, and made easily readable by division into short chapters. Of special interest is the point that electromyography can help to distinguish between fixation of the crico-arytenoid joints and paralysis of the cords. The coloured illustrations of the various lesions of the cords are good and clear, though glowing with a curious pink tinge. For carcinoma of the cord laryngo-fissure is preferred to irradiation, and the discussion on laryngectomy is full of common sense. This operation and that of Owen for pharyngotomy are excellently described and illustrated. The author's wide experience is evident in the chapter on endoscopy, and he favours general anaesthesia for oesophagoscopy.

The third part is on the oropharynx and nasopharynx. The well-worn subject of removal of tonsils and adenoids is truly dealt with, indications being described as "absolute" and "considered"; perhaps the impression given is that the tonsil is the source of all evil. In conjunction with the pathologist and the expert on irradiation the difficult matter of malignant disease of the nasopharynx is made clear. The fourth part is on the diseases of the nose and accessory sinuses and is of a very high standard. The author has a heavy task, but has carried it out with striking success. After an account of the anatomy, physiology, and examination of the nose, a chapter is devoted to local analgesics, which gives many practical hints and instructions on their use. There is a chapter on allergy by Professor Lucas so skilfully written that this most complicated subject appears comparatively simple. In the following four chapters acute and chronic inflammations are clearly described, as is epistaxis and its rarely needed surgical treatment. The author of the chapters on sinusitis has made the pathology and diagnosis of the condition in the various cavities as clear as may be. There is a separate and first-rate chapter on the treatment, which is illuminated by many admirable illustrations.

The fifth part is on the ear and is a tour-de-force on the part of its author (the editor). It is a most complete and up-to-date account of this vast subject, written in a scholarly style, and it is evident that the author has a complete and clear grasp of the pathology of infections of both middle and inner ear. The chapters on hearing are excellent, and include all the most recent research on audiology; theories on hearing are fully discussed, and Helmholtz's favoured for several reasons. The whole field of middle and internal ear deafness, with acute and chronic inflammations and the various types of operation, are all there clearly illustrated. The author discusses otosclerosis, and emphasizes that histological otosclerosis is four to eight times more frequent than deafness from that disease. There is no description of the fenestration operation, but good diagrams of the various openings made at it. In considering chemotherapy, the author insists that as much consideration must be given to

ordering a course as that given to advising operation. Causes of aural vertigo are discussed and Atkinson's work on histamine reactions reviewed. Complications of middle ear suppuration are also described. Accounts of two complications are put into other hands. These are facial paralysis, fully and expertly discussed by Miss Collier, and intracranial abscess by Professor Lambert Rogers. He gives an excellent account of the neurosurgical approach and its technique, with appropriate illustrations.

This treatise should be in the hands of all who wish to specialize in otolaryngology.

W. M. MOLLISON.

THE DISK IN GENERAL PRACTICE

Disc Lesions for the General Practitioner. By James Cyriax, M.D. Foreword by R. Barbor, M.B. (Pp. 37. 5s.) London: Cassell and Co. 1953.

This little book provides both a challenge and a warning. It purports to show the general practitioner not only how to take a careful history and make a thorough examination in order to localize the lesion, but also in many cases how to treat by manipulation a host of lesions that were formerly called lumbago, sciatica, pleurodynia, fibrositis, and the like—all this with few ancillary aids besides his wits, his hands, and an examination couch.

Enthusiasts like Dr. Cyriax are apt to build mansions of theory on slender foundations of evidence. That disk protrusions, whether of nucleus pulposus or annulus fibrosus or both, occur and cause symptoms and signs are now generally accepted facts. That it is possible to distinguish between the protrusion of a ruptured annulus and the oozing out of the substance of nucleus pulposus is not so easily acceptable. Yet on this distinction depends the decision whether to manipulate or not. Again, as most protrusions will reduce spontaneously with rest in a suitable position, and as manipulation is to be used only when symptoms persist, it will be only in severe attacks of pain that manipulation will be required. It is precisely in these severe attacks that there is most danger to the spinal cord if the manipulation is unsuccessful. Dr. Cyriax is an acknowledged expert as well as an enthusiast, and in his hands, especially as he advises against the use of an anaesthetic, the patient runs little risk, but the comparatively inexperienced general practitioner will need to be careful. Most general practitioners have experience of patients who were not improved even by the most expert manipulators and of others who were treated for some time before their disease was found to be due to something quite other than disk protrusion.

It is only fair to say the author is fully aware of the dangers and gives warning of them, so that many general practitioners may well accept the challenge and open up new and delightful fields of exploration and treatment. The book is condensed, which does not make for easy reading, and some of the phraseology is obscure, but doubtless it is not meant to be more than a stimulus to inquiry and endeavour.

C. W. WALKER.

DISPOSAL OF THE DEAD

The Disposal of the Dead. By Professor C. J. Polson, M.D.(Birm.), F.R.C.P., R. P. Brittain, M.B., B.L., LL.B.(Glasgow), and T. K. Marshall, M.B., Ch.B.(Leeds). (Pp. 300. £1 1s.) London: English Universities Press. 1953.

The law of burial, a dry subject, has already received attention, notably by Fellows, and is accessible. But the larger subject of disposal of the dead, which includes embalming, cremation, transport, burial, and exhumation, has been tackled for the first time—and with success—by Polson and his staff at Leeds. This new book achieves a remarkably comprehensive survey of these macabre subjects while contriving at the same time to be more than factual. Indeed, Brittain's scholarly vignettes of the history of embalming, cremation, and burial rites, and Polson's eye for apt illustration from case reports, combine to leaven the subject with much interest, even some humour. The result is a most

readable yet plainly authoritative reference book which registrars, coroners, public health authorities—and, not least, undertakers—will find of inestimable value.

Polson's interest in the funeral director is timely, for England is slower than the U.S.A. (curiously not mentioned in the index) to appreciate the advantage of intelligent collaboration with the undertaker. The somewhat elementary sections on anatomy for the embalmer and on his stock-in-trade are excusable on these grounds.

The duty to ascertain both the fact and cause of death is an onerous one, and Polson spares no pains to give it due weight. His emphasis, particularly plain in his own contributions, is on accurate practical guidance. He has the ability of the good teacher to recognize his pupils' uncertainty, and careful reading found no avenue inadequately explored.

This valuable addition to the somewhat scanty literature on the disposal of the dead is a practical, authoritative guide which should be at the elbow of the doctor, registrar, and undertaker, and will undoubtedly attain the status of a standard reference book on the subject.

KEITH SIMPSON.

THE SUPRARENAL CORTEX

The Suprarenal Cortex. Edited by J. M. Yoffey. Proceedings of the Fifth Symposium of the Colston Research Society held in the University of Bristol, April 1-4, 1952. (Pp. 232. £2 2s.) London: Butterworth Scientific Publications, 1953.

The world is a vast place, even in this jet era, and if the busy scientific research ants are transported by this or that foundation to this or that steroid mound, who can fail to appreciate the clean impressive publications with familiar chapter headings that record for all time the unequivocal calibre of their cordial confabulations? This present volume is a magnificent compendium of up-to-the minute knowledge by modern masters. C. H. Li, of Berkeley, California, writes on the preparation and properties of A.C.T.H., and the theme is continued by Dixon, Stack-Dunne, and Young, of Cambridge University, and concluded by the Morris group of the London Hospital. J. M. Yoffey, of Bristol, who did so much to organize the symposium and who has edited with great skill, discusses the structural background of the suprarenal cortex and supports the view that the zona reticularis is an actively functioning and morphologically independent zone, probably concerned with the production of androgens and responding readily to stress.

F. Verzar, of Basle, Switzerland, considers the nature of adrenal cortical secretion and the mechanism of the influence of cortical hormones on metabolism. Marthe Vogt, of Edinburgh, carries forward her pioneer work on the control of the secretory activity of the adrenal cortex. She concludes that the perfused adrenal carries out its synthetic activity efficiently but at a steady rate, and that the only physiological mechanism found to accelerate its secretion is the addition of A.C.T.H. to the perfusing fluid. Zuckerman, of Birmingham, thoroughly discusses with his usual, or rather exceptional, perspicacity the adreno-genital relationship, and among other thoughts implies from experimental evidence that secretory elements of the gonads are able, under certain conditions, to serve as accessory adrenal tissue, and that the adrenal cortex reciprocally can act as tissue "not dissimilar from the secretory tissue of the gonads." Folley, of Reading University, discusses the unsuspected role the adrenal cortex is now seen to play in lactogenesis, indicating the use of the lactating-mammary-gland slice for metabolic studies. Marrian, of Edinburgh, discusses with care and profundity the use and fallacies of urinary adrenocorticoid steroid assays, a valuable presentation which was further elaborated at a recent conference of the British Endocrine Society. It is the opinion and experience of the reviewer that the use of chromatography applied to suitable clinical material, dynamically studied by periods of cortisone and A.C.T.H. administration and after bilateral adrenalectomy, is perhaps qualifying the scepticism of some about the potential value of the chemist to the clinician—and, may we add, vice versa.

It may be that studies on blood will prove even of greater value. A. J. Robinson, of the Merck Institute, U.S.A., considers the role of the adrenal gland in infection; animal and experimental findings have shown the dangers, sometimes lethal, of A.C.T.H. and cortisone, even when symptomatic improvement results, but it is also known that the adrenals enlarge during infections and that adrenalectomized animals are sensitive to infections. Robinson's finding that small doses of cortisone may aid resistance to infection is in keeping with the latter considerations.

Hoagland, of Massachusetts, considers the influence of adrenal steroids on personality disorders. Cameron, of University College, London, produces important histological evidence on the tissue response to A.C.T.H. and cortisone. Krohn, of Birmingham, discusses steroid hormones and skin grafting; Dwight Ingle successfully achieves a holism with "the role of the adrenal cortex in homeostasis"; Heller, of Bristol, introduces the important theme of the adrenal cortex and water metabolism; Broster, of London, is refreshingly pragmatic in the "surgery of the adrenal gland"; Astwood, of Boston, draws on clinical experience of high order to discuss the effects of cortical steroids and A.C.T.H.; and Kersley, of Bath, considers the response of rheumatic disease. And the exhausted reviewer ponders on whether Will Mayo's advice to him to specialize on only one endocrine gland was more in keeping with the limitations of the human intellect than the fine tradition of remaining a general physician, come what may.

S. LEONARD SIMPSON.

CELL PHYSIOLOGY

Symposia of the Society for Experimental Biology: No. 6. Structural Aspects of Cell Physiology. (Pp. 357; illustrated. £2 5s.) Cambridge: The University Press, 1952.

Although it has lost its former Grecian gaiety the symposium* is becoming increasingly popular. To some extent it solves the rather pressing problem of those engaged in the application of the basic sciences to medicine who find it impossible to keep abreast of the scattered and highly technical literature of modern physiology. While no longer a drinking-party, the symposium is still a "party," and the 21 papers published in this volume were read to the company of biologists who held their party at Bristol in 1951, presumably under the guidance of a symposiarch. The programme was a skilful blend of fundamental problems in cell physiology, and, as might be expected, the nature of the cell membrane and the problem of permeability and secretion were introduced in full measure. Professor Danielli discussed the broad problem, and was followed by B. Katz, who elaborated the accepted principle that the nerve impulse is conducted along the cell membrane of the axon. John Runnström, of Stockholm, discussed cell surface in relation to fertilization. M. M. Swann, seeking an explanation for the intimate relation between mitosis and cell cleavage, believes that this is conditioned by the release from the chromosomes of a catalytic substance. Other papers relating to the cell surface dealt with cell membranes in relation to cell division, and the action of anaesthetics on amoebae. More closely related to medical problems were papers on the cellular fate of injected antigens and the behaviour of viruses within cells. An account of the role of the nucleus and cytoplasm in intracellular synthesis and morphogenesis by J. Brachet, and another on ultra-violet absorption by living cell nuclei by P. M. B. Walker and H. B. Yates, introduced two broad problems having considerable current interest.

The papers in this series are difficult to read without some general knowledge of the physical sciences, but, taken as a whole, they show the extent to which these sciences and their special techniques are being brought to bear on a large range of biological problems.

GEOFFREY HADFIELD.

*"Symposium: Ancient-Greek after-dinner drinking-party with music, dancers, or conversation; any drinking-party."—*Concise Oxford Dictionary.*

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INSULIN AND GROWTH

The dwarfing effect of hypophysectomy in experimental animals has long been known, and largely owing to the inspiration of Herbert McL. Evans, who was elected a Foreign Member of the Royal Society two years ago, a protein named variously growth hormone, somatotrop(h)ic hormone, and somatotrop(h)in was isolated from the tissues of the anterior pituitary gland of oxen in 1945.¹ This pituitary growth hormone is remarkably active in inducing growth in hypophysectomized rats, but so far has had meagre success in cases of human dwarfism of apparently pituitary origin. Indeed, many endocrinologists are beginning to doubt the hitherto accepted view that "pituitary" dwarfism does arise at all frequently as the result of a deficiency of growth hormone.

In recent years the idea has been gaining ground that pituitary growth hormone needs, for its complete action, the co-operative secretion of insulin by the pancreas. Whether growth hormone directly stimulates the secretion of the extra insulin, and if so by what mechanism, are still matters for debate, but it is certain that under clearly defined conditions the growth-promoting action of growth hormone depends on the availability of insulin. Thus the experiments of Milman, DeMoor, and Lukens² showed that the administration of growth hormone to a depancreatized cat caused no anabolism of protein unless insulin was simultaneously given, and the retention of nitrogen induced by the growth hormone was not maximal unless a substantial dose of insulin was given in addition to that needed by the animal in the absence of growth hormone. Young³ has recently reviewed the relationship between the growth hormone, the pancreas, and diabetes, and the view first put forward by him in this *Journal* in 1939⁴ is now widely

accepted. According to this the action of growth hormone in inducing growth depends at least in part on the ability of the pancreas to secrete extra insulin, and, if the pancreas cannot produce enough insulin, then the growth hormone causes diabetes instead of promoting growth,^{5,6} since growth hormone directly or indirectly so acts on the tissues as to induce a diminished sensitivity to the hypoglycaemic action of insulin, a phenomenon which has been particularly investigated in Cori's laboratory.⁵

If the action of growth hormone depends on the secretion of extra insulin by the pancreas, and if the diminished sensitivity to insulin's hypoglycaemic action is not essential to the growth-promoting action of growth hormone, then it might be possible to induce growth in the hypophysectomized animal by the administration of insulin alone. In this issue of the *Journal* Mr. James Salter and Dr. Charles H. Best report at page 353 experiments on hypophysectomized rats which fulfil this expectation and which have already been briefly reported elsewhere.⁶⁻⁸ The dangers of spontaneous hypoglycaemia in the hypophysectomized rat and the hypersensitivity of this animal to the hypoglycaemic action of insulin are so well known that many workers have hesitated to investigate such a possible growth-promoting action of insulin therein. But Salter and Best have succeeded where many feared to try, and they report that a slow-acting insulin in gradually increasing doses induces somatic growth, including growth of the skeleton, in hypophysectomized rats, while untreated control animals grew not at all. The insulin-treated rats ate more than untreated control animals, and this was undoubtedly of importance in causing the growth; but in 1951 Maassen⁹ reported that insulin-treated normal rats grew faster than pair-fed control animals, so that food intake alone is unlikely to be a limiting factor. Indeed, it seems probable that insulin exerts a much more important action on protein building in the body than has hitherto been suspected.

At a Ciba Foundation Colloquium last year Conn¹⁰ reported some comparable results in the human being. The subject was a 17-year-old male pituitary dwarf with diabetes mellitus, who appeared to be suffering from panhypopituitarism as the result of a calcified craniopharyngioma. When he was given insulin with constant food intake there was nitrogen retention of 1½ g. a day, though Conn concluded on the basis of the observed changes in electrolyte balance that insulin induced a form of nitrogen retention different from that produced by growth hormone.

We have therefore the interesting and paradoxical situation that growth hormone cannot induce growth in the absence of insulin, while insulin can induce a

¹ Li, C. H., Evans, H. M., and Simpson, M. E., *J. Biol. Chem.*, 1945, **159**, 353.
² Milman, A. E., DeMoor, P., and Lukens, F. D. W., *Amer. J. Physiol.*, 1951, **166**, 354.

³ Young, F. G., *Recent Progr. Hormone Res.*, 1953, **8**, 471.

⁴ See Krahl, M. E., *Ann. N.Y. Acad. Sci.*, 1951, **54**, 649.

⁵ Best, C. H., *Diabetes*, 1952, **1**, 267.

⁶ Best, C. H., in *Ciba Foundation Colloquia on Endocrinology*, Vol. VI, *Hormonal Factors in Carbohydrate Metabolism*, 1952, ed. by G. E. W. Wolstenholme and J. S. Freeman, London, 1953, p. 216.

⁷ Salter, J., and Best, C. H., *Fed. Proc.*, 1953, **12**, 122.

⁸ Maassen, A. P., *Proc. Kon. ned. Akad. Wet.*, 1951, **54**, 160.

⁹ See ref. 7, pp. 128-135.

¹⁰ Ottaway, J. H., *Nature (Lond.)*, 1951, **167**, 1064.

form of growth in the absence of growth hormone. The possibility that, clinically, dwarfism results from a relative insulin deficiency, not sufficiently severe to induce diabetes but insufficient to support growth, is obviously one to be considered. Another is whether gigantism can ever result from hyperinsulinism unaccompanied by pituitary overfunction. That the actions of insulin and of growth hormone on growth are not identical in every way is clear from the results both of Salter and Best and of Conn, and it is perhaps unlikely that acromegaly ever develops as the result of hyperinsulinism.

Since insulin mimics growth hormone in inducing growth, it is perhaps not entirely unreasonable that growth hormone might mimic insulin in possessing hypoglycaemic activity. Indeed, an insulin-like activity of growth hormone has been observed both *in vitro*^{1,2} and *in vivo*.⁵ Dr. J. H. Ottaway, in an article we publish at page 357, now brings forward evidence that the insulin-like action of growth hormone observed *in vitro* is due to the liberation by growth hormone of insulin held in an inactive state in the blood or tissues. If this finding is generally supported it will simplify the situation a little, though the physician may well regret the passing of the day when the idea of a growth-stimulating hormone seemed to be straightforward, while insulin was simply the anti-diabetic hormone. But the vicious circle of the endocrine system will provide more shocks, both for the experimentalist and for the doctor at the bedside, though the pattern ultimately revealed may have that simple elegance which usually lies at the basis of Nature.

TREATMENT OF ACUTE POLIOMYELITIS IN HOSPITALS

A year ago we published in "Any Questions?" an answer¹ to an inquirer who wanted to know whether it was advisable to admit patients with infantile paralysis to the general wards of a hospital. Our expert concluded his reply by advising that "the interests of the patient should take priority over the theoretical risk involved in sending the patient to a general rather than an isolation hospital." A lively correspondence arose from this question and answer, and in an informative letter Dr. A. H. Gale² presented evidence to show that the danger of cross-infection in general wards might be something more than theoretical. In fact he was inclined to the view that in the present state of knowledge it would be wise to admit patients in the acute stage to hospitals for infectious diseases. Other correspondents quite

rightly pointed out that some infectious diseases hospitals were more suitably staffed and equipped to nurse patients with poliomyelitis, even when respiratory paralysis was present, than neighbouring general hospitals. Dr. W. Ritchie Russell,³ in a later contribution, made the essential recommendation that, irrespective of the type of hospital, "the doctors in charge should make sure that their knowledge is up to date, that the nursing staff are properly trained, and that the best possible equipment is available."

These and other points are discussed and practical advice given in a commendably concise report⁴ of the Committee on Poliomyelitis of the Royal College of Physicians. The committee agrees that there is a need for strict isolation of patients with poliomyelitis, but believes that "adequate safeguards properly carried out" reduce the risk of infection to a minimum. "As a general rule," the report continues, "cases of poliomyelitis should be admitted direct to hospitals that have been specially equipped for the treatment of the acute stage along the lines suggested." It follows that regional boards, besides making provision for the care of sporadic cases, should have plans prepared for dealing with epidemics, but "there is scope for variation of the details of the plans in different regions."

The committee recommends that the immediate supervision of patients in the acute stage of the disease should be by registrars or senior registrars who have had at least a short course in the care of acute poliomyelitis. House-officers should also have had some special training, "so that one competent doctor can be summoned to a case at very short notice." A vital requirement in the treatment of some patients is the maintenance of a free air-way, and anaesthetists or E.N.T. specialists should be available by night or day to give their assistance. The team of consultants who may be called in to give advice should include neurologists, general and infectious diseases physicians, paediatricians, orthopaedic surgeons, and thoracic surgeons who have a knowledge of acute poliomyelitis. Even though consultants are now spread out more widely than they used to be, this list will still look formidable in areas of the country remote from medical centres. The committee itself adds the warning that too many specialists may confuse the management of the case.

No one with experience of treating poliomyelitis has to be reminded of the importance of skilful nursing, and the special training of nurses in hospitals

¹ *British Medical Journal*, 1952, 2, 349.
² *Ibid.*, 1952, 2, 516.
³ *Ibid.*, 1952, 2, 1204.
⁴ Second Interim Report of the Committee on Poliomyelitis, Royal College of Physicians, London: "The treatment of Poliomyelitis with special reference to the nursing and medical facilities required in hospitals which admit cases of acute poliomyelitis."

selected for the treatment of poliomyelitis must go hand in hand with the training of the medical staff. There are many nurses in infectious diseases hospitals, large and small, who have gained invaluable experience of nursing patients with poliomyelitis in past epidemics, and in addition to these the committee recommends that a panel of nurses who volunteer to treat patients in the acute stage should be prepared in all regions. When their services are required they should be released from other work immediately. Collaboration between the medical staffs of special departments—especially the E.N.T., anaesthetic, and thoracic surgery departments in a hospital or hospital group—should lead to arrangements for the transfer of nurses from the special departments to assist with the care of complicated cases of poliomyelitis.

The committee's report concludes with a list of the special requirements, including equipment, which the diagnosis and treatment of poliomyelitis in the acute stage now demand. No doubt regional hospital boards have made ready to meet any epidemic of poliomyelitis that may occur this year, but the publication of this report should stimulate them to re-examine their plans in the light of the latest knowledge about this disease.

REDUCTION OF POST-OPERATIVE PAIN

Most abdominal operations are followed by pain for the next few days, but too often the surgeon seems to overlook his patient's feelings—or so at least it appears to a sensitive and intelligent patient—and to regard pain as the unfortunate but unavoidable sequel to any intra-peritoneal manipulation. He is content for the most part to leave its relief to his houseman's cautiously administered opiate and to the balm that comes from time alone.

Many recall only too vividly the recurring windy spasms that follow even the simplest of laparotomies. This pain, which is mainly visceral in origin, cannot readily be blocked at the periphery and is, at least in part, unavoidable. But it can be lessened to some extent by planned incisions which afford easy access, by intelligently applied retraction, by gentle handling, and by avoiding the too early use of aperients and enemas.

But it is in the relief of pain in the wound itself that we can hope to achieve something better, and this endeavour is surely worth while. For, apart from the patient's wish for a comfortable recovery, there are

other and even more urgent considerations. We are only too familiar with the patient who lies immobile in bed awaiting with bravely borne, but all too evident, apprehension the tearing discomfort that accompanies his suppressed and quite ineffectual bouts of coughing. He submits with reluctance to the enthusiastic cajolery of the physiotherapist and grudgingly consents to getting on his feet early, which he finds calculated to boost his surgeon's morale rather than his own. If there is any virtue in these post-operative measures, we must surely do everything we can to make it easy for our patient to co-operate.

Morphine remains the stand-by as a pain reliever, but unfortunately it depresses the respiratory centre and the cough reflex. It is this and the other undesirable central effects of the opiates which have led to a continuing search for alternative methods of relieving pain. Crile¹ used to inject a solution of quinine and urea hydrochloride round the wound, and slowly acting anaesthetics in oily solutions have had their champions since.²⁻⁴ But, in addition to difficulties in the handling of these viscous solutions, their use is not free from the hazard of tissue necrosis and abscess formation. More recently several non-oily saturated solutions of anaesthetic agents have been introduced. These, on coming into contact with body fluids, are precipitated as micro-crystalline depots which yield an effective concentration of the drug locally for a long time.⁵⁻⁷ Such is "efocaine,"⁸ the use of which has recently been reported in this *Journal* by Roualle,⁹ and with some enthusiasm. Such solutions have the disadvantage of being non-diffusible, so that a precise blocking of nerves at some distance from the wound is more likely to succeed than any local infiltration. The local instillation three-hourly of procaine through fine polythene tubes introduced into the parietes at the time of operation has been suggested as an alternative, but this method necessitates a careful operative technique and an exacting post-operative routine.¹⁰

All local injections are proscribed in the presence of infection, a limitation to which the administration of procaine intravenously is not subject. This drug has been used both in a drip infusion^{11,12} for the relief of post-operative pain and in a single injection as an indirect method of encouraging coughing in cases of atelectasis.¹³

Despite such attempts to relieve the discomfort of the post-operative period, there is little indication that they have attracted enough attention, and certainly no particular method has yet been widely adopted. Surgeons and anaesthetists alike could with good reason continue to apply themselves to this problem, which concerns not only the patient's comfort but also his health after operation.

BREAD IN THE GUT

The laxative effect of wholemeal bread has been known since the days of Hippocrates and Galen. That such bread passes through the gastro-intestinal tract quicker than its white counterpart can be demonstrated by incor-

¹ *Operative Surgery*. By W. S. Bickham. Vol. 1, p. 176. Philadelphia: W. B. Saunders, 1924.
² Gabriel, W. B., *British Medical Journal*, 1929, 1, 1071.
³ Morgan, C. N., *ibid.*, 1935, 2, 938.
⁴ McCleery, R. S., et al., *Surg. Gynec. Obstet.*, 1948, 88, 680.
⁵ Rappaport, F., *Acta med. orient.*, 1946, 5, 115.
⁶ Vitali, M., and Kohn, J., *British Medical Journal*, 1950, 2, 415.
⁷ Rutter, A. G., *ibid.*, 1952, 2, 1418.
⁸ Mason, A. H., and Shaftel, H. E., *Amer. J. Surg.*, 1952, 83, 549.
⁹ *British Medical Journal*, 1952, 2, 1293.
¹⁰ Lewis, D. L., and Thompson, W. A. L., *ibid.*, 1953, 1, 973.
¹¹ McLachlin, J. A., *Canad. med. Ass. J.*, 1945, 52, 383.
¹² Pooler, H. E., *British Medical Journal*, 1949, 2, 1200.
¹³ Siddons, A. H. M., and Landau, E., *Lancet*, 1949, 2, 419.

porating in the food "markers" such as carmine or charcoal to colour the faeces. We do not know where the speed-up actually occurs. McCance, Prior, and Widdowson¹ have tried to find this out by following radiologically the passage through the bowel of meals consisting largely of wholemeal (100% extraction) and of white bread (70% extraction). They gave six normal subjects a small quantity of barium sulphate mixed with a large quantity of bread and by radiography watched the transit of this mixture through the gastro-intestinal tract. This technique of observing the passage of the food through the bowel is not new, having been employed some fifty years ago in the early days of radiology. Large quantities of radio-opaque substances were then used to outline the gastro-intestinal tract. But McCance and his colleagues used as little barium sulphate as possible, consistent with good radiological delineation of the gut, so that the barium sulphate would have only a slight effect on the passage of the meal through the gastro-intestinal tract. About three-quarters of the total daily calories was provided by the bread, the remainder being derived from small amounts of bacon, eggs, cheese, meat, butter, and preserves. The subjects were screened or radiographed every half-hour for eight hours after the bread and barium sulphate meal, the further progress of which was studied by examining the subjects radiologically every day until the barium sulphate had been evacuated per rectum. Both salivary and gastric secretion were greater on the brown bread diets, and brown bread was evacuated from the stomach and passed through the small intestine more rapidly than white bread. The residue from the brown bread was greater than that from the white bread in the ileum and colon, and it left the latter 24 hours sooner.

Why a meal of brown bread should leave the stomach more rapidly than one of white bread is not known with certainty; probably increased salivary and gastric secretion may be contributory. The radiological appearances in the small gut suggested that the absorption of the white bread was more rapid and complete than that of the brown. This has already been shown by chemical balance tests.² It is probably the "filling" effect of the hydrated celluloses and hemi-celluloses in the brown bread rather than its mechanical irritation that accounts for its quicker transit through the small gut. The quicker transit through the large gut and quicker expulsion of the brown bread residues from it was probably due to the increased bulk of the faeces. While these radiological studies and the chemical balance studies of McCance and Walsham² show that the passage of white bread through the gut is slower than that of brown bread, and that a greater portion of it is digested in the sense that it leaves less residue, this does not prove that white bread is any more nutritious than brown or vice versa. Even if white bread does remain in the gut longer than brown and appears to be better digested, it is a moot point whether this compensates for the removal of a very high percentage of nutrients in its preparation. In the processing of white flour a third of the protein, two-thirds of the essential

amino-acids and riboflavine, practically all the vitamin A, and 80% of the iron, nicotinic acid, and aneurine are removed, as well as other members of the vitamin B complex. The slightly improved digestibility of white bread becomes rather academic in the light of these figures. For persons whose economic circumstances permit them to eat a good mixed diet it probably matters little whether they eat white or brown bread, but for those whose staple food is bread the colour is important.

INHERITANCE OF RHEUMATIC FEVER

The aetiology of rheumatic fever remains unknown. There is good but indirect evidence that infection, perhaps repeated infection, plays a part. There is also reasonable support for the hypothesis that there are inherited differences in susceptibility to the disease. The suggestion that the infective agent is the haemolytic streptococcus is based in part on the parallelism of the mortality rates from scarlet fever and rheumatic fever in Britain and North America and in part on the frequency with which an attack of streptococcal tonsillitis precedes an attack of rheumatic fever by two to three weeks. During the war Macdonald¹ made use of the fact that both scarlet and rheumatic fever were notifiable in the Royal Air Force to show that the morbidity rates for the two conditions were closely related.

Morbidity is related to social class. This is clearly shown in the figures for Sheffield, where the disease was made notifiable in 1947. The morbidity ratio increases from 48 in children in Social Class I to 147 for children in Social Class V. Hewitt and Stewart² have recently analysed the information collected about the home conditions of these children and a control group to see if they could discover what it was that was responsible for the class difference. It was apparent that neither family income nor income per head was the operative factor. The condition of the home, too, was not important. There was little relation to the degree of statutory overcrowding. But there was a significant relation to the number of people living in the household. Since both large families and more than one family in a household are more common in Social Class V, this might account for much of the difference between social classes. The explanation may well be that the more people there are in the household the greater the chance that infection will be brought into the home. A complementary finding is that the risk of developing rheumatic fever increases greatly at the age of 5, when children first go to school.

The evidence for differences in inherited susceptibility is also somewhat indirect. Several studies, including a recent investigation from Northern Ireland reported by Cheeseman and Stevenson,³ show a mild degree of familial concentration for rheumatic fever. In the Northern Ireland surveys 3% of about 800 brothers and 7.8% of about 750 sisters of the index cases show clinical evidence of rheumatic fever. The real risk of

brothers and sisters developing the disease must be higher than this, since many of them are still young and might develop the disease; moreover, this simple method of counting the proportion of the brothers and sisters affected, apart from the index case, usually underestimates the risk. If repeated infection is important in causing rheumatic fever, then caution is needed in interpreting a familial concentration as being due to genetic resemblance. But a striking feature of this and the earlier family studies was that the risk to the brothers and sisters was doubled if one of the parents had also been affected. This might perhaps be due to infection persisting in the affected parent and being transmitted to the children, but it seems much more likely that it represents an increased genetic susceptibility. Some confirmation of this is supplied by the few available series of twins. In the Northern Ireland series the one monovular pair were both affected, but one only of each of the nine binovular pairs was affected. In another similar series, that of Wilson and his colleagues,⁴ the two monovular pairs were both affected whereas only one member of each of the three binovular pairs was affected. Nevertheless, rheumatic fever is certainly not entirely genetically determined, for several instances are known in which only one of a pair of monovular twins had the disease.

DIAGNOSING THE SEX

Sexual characteristics in insects are determined entirely by chromosomal constitution and are apparently uninfluenced by hormones. Gynandromorphs are most commonly seen in butterflies of the family Lycaenidae (the blues and coppers). Abnormalities in cell division may give rise to females with areas of the characteristic male blue on their predominantly brown wings, or in more extreme cases an insect may be male on one side of the body and female on the other. In mammals the situation is different. The well-known freemartins in cattle show that hormones may greatly influence sexual development *in utero*, while partial sex reversal in post-natal life is too well known in man to justify further description. But there is no evidence that hormones can override chromosomal constitution entirely. If this were so one could produce a functional female with a large X chromosome and the very much smaller Y chromosome, and a functional male with two X chromosomes. Given a normal mate, the latter would produce only female offspring.

The result of the mammalian Y chromosome being much smaller than the X is that females have somewhat more chromatin than males in every cell in the body. Barr, Bertram, and Lindsay¹ found in female cats a minute chromatin granule in contact with the nucleolus in the anterior horn cells; it was absent in males. Outside the central nervous system a slightly different picture was found. Here female nuclei were distinguished by a chromatin mass in contact with the nuclear membrane. These differences are present before gonadal differentiation occurs and were not influenced

by gonadectomy or hormonal treatment. The authors attribute the bodies to the relative excess of chromatin in XX cells. Moore and Barr² showed that differences of this nature were not confined to the cat, although they are apparently absent in rodents and in the rabbit.

Moore, Graham, and Barr³ have now found that human skin shows this sexual difference in nuclear structure. They also studied two cases of pseudo-hermaphroditism. The first appeared to be predominantly female, and her skin showed the characteristic female nuclear structure. Clinical examination of the second case disclosed predominantly male characteristics, and skin biopsy again gave a consistent picture. The so-called true hermaphrodite has either an ovo-testis or an ovary and a testis. It may be that they represent a chromosomal mosaic corresponding to the insect gynandromorph, and it would be interesting to learn the nuclear structure in such cases.

It is to be hoped that these findings will be tested in other laboratories. If confirmed they can hardly fail to be of benefit in the study of intersexuality and may cast light on other problems.

MILK ASPIRATION PNEUMONIA

Mononuclear pneumonia has been of increasing interest in recent years. Cases of atypical pneumonia of all sorts have been reported from many countries, and when these have been fatal the lung histology has often shown monocyctic, rather than polymorph, infiltration. The similarity between these "primary atypical pneumonias" in adult life and the often minimal lung lesions found at necropsy in infants has led to the supposition that in the latter the cause is also a virus. The possible part played by mucus causing mechanical obstruction has been considered by Robertson and Morle^{1,2} and Emery.³

Moran⁴ was struck by the difficulty in distinguishing microscopically virus pneumonia in infants from that caused by aspiration of milk. In a series of experiments in which varying amounts of feeding mixtures, cow's milk, and human milk were introduced into rabbits' tracheas, Moran was able to reproduce the lesions found in babies who had aspirated milk—namely, acute pneumonia, abscesses, granulomas, giant cell reaction, and fibrosis. The reaction was usually mononuclear. Although the lesions bore some resemblance to those of lipid pneumonia, they could be produced with milk from which all fat had been removed. The introduced material was seldom recognizable after a week. Perhaps the most surprising finding was the rapidity with which the respiratory tract reacted to the milk, exudation of red blood cells, granulocytes, and macrophages being found almost immediately, and certainly within ten minutes.

Clearly this work will be of much interest to all concerned with the respiratory pathology of infancy. Immediate thoughts will be that not all mononuclear pneumonias in babies are necessarily of virus origin, and that one cannot be too careful when feeding infants.

¹ *Brit. J. Nutr.*, 1953, 7, 98.
² *Ibid.*, 1948-9, 2, 26.

¹ *British Medical Journal*, 1950, 1, 992.
² *Brit. J. Soc. Med.*, 1952, 6, 161.
³ *Ann. Eugen. (Camb.)*, 1953, 17, 177.
⁴ *J. Pediatr.*, 1943, 22, 468.

¹ *Anat. Rec.*, 1950, 107, 283.
² *J. comp. Neurol.*, 1953, in press.
³ *Surg. Gynec. Obstet.*, 1953, 96, 641.

¹ *British Medical Journal*, 1951, 2, 994.
² *Ibid.*, 1953, 1, 130.
³ *Ibid.*, 1952, 2, 1067.
⁴ *Arch. Path.*, 1953, 55, 286.

REFRESHER COURSE FOR GENERAL PRACTITIONERS SPECTACLES

BY

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Some general practitioners are endowed with enough special knowledge of ophthalmology to decide whether their patients need spectacles and, if so, to carry out the tests whereby the proper strength of glass can be ascertained. Such an arrangement has obvious advantages, but those who aspire to enter general practice find the time for training all too short. If they have a year to spare after serving as casualty officer, house-physician, and house-surgeon, most of them will be inclined to seek extra experience in obstetrics, paediatrics, or other branches of medicine closely linked with general practice. Only a minority will find time to familiarize themselves with refraction and ophthalmoscopy. Nevertheless all qualified practitioners who attend families, schools, factories, offices, and Service units are responsible for advising examination of their patients' eyes. They seldom need to concern themselves with the merits of rival examining techniques, but they must see that refractive defects are investigated and appropriate prescriptions given. Most of them have a healthy objection to their patients being saddled with unnecessary glasses.

Functions of Spectacles

Before considering some of the questions which frequently arise concerning spectacles, it is appropriate to emphasize what are the main purposes which these appliances can fulfil. First and most obvious is the provision of clear images. Thus to a patient afflicted with several degrees of myopia (short-sightedness) all objects more than a few inches away will appear misty, unless his refractive error is counteracted by concave spectacles. Secondly, spectacles are an important item in the treatment of squint and other disorders of ocular muscle balance. In such cases it will often happen that the glasses incidentally permit clearer vision, but sometimes the opposite will obtain. For instance, a hypermetropic (long-sighted) child suffering from accommodative squint often finds that objects seen through the appropriate convex lenses appear less well defined than they did with the uncorrected vision, until enough time has elapsed for adaptation to the new spectacles. Thirdly, spectacles may be used as a means of protection against uncomfortable or dangerous influences. Anti-glare glasses for use in bright sunshine are increasingly demanded. Other types of spectacles have been devised as a shield from infra-red rays or noxious vapours in certain industrial processes, as well as from flying particles and other occupational hazards.

Refraction not a Closed Compartment of Knowledge

Although retinoscopy, which is the main objective means of estimating refractive error, could be learned in a few weeks by the exercise of intelligent application, many processes besides retinoscopy are needed before a correct decision can be reached with regard to spectacles. Questions of age, aptitude, and occupation must be considered, and the interpretation of subjective tests is not always easy. Then again, refractive errors are often associated with, and may even arise from, certain constitutional diseases—for example, diabetes. A technically competent retinoscopist ignorant of ophthalmoscopic signs will inevitably order

glasses for patients incapable of benefiting thereby. Let us therefore agree that *no spectacles (other than mere protective appliances) should be prescribed until the ocular fundi and media have been thoroughly surveyed*. We have already seen that there are many other relevant considerations besides the actual state of the eyes, but at least that state must be determined before entertaining the possibility of spectacles. It will now be convenient arbitrarily to divide patients into three categories: (1) those up to the age of 14 years; (2) those from 14 to 40 years; and (3) those over 40.

Patients under 14 Years

Children with a large amount of refractive error, especially if they are myopic, will require spectacles to enable them to see clearly; and, although failure to supply the necessary glasses will not directly damage such children's eyes, it must be remembered that other serious disadvantages are entailed. To live in a world where every inanimate object looks misty, and every human face is a featureless blur, must grievously retard the growth of knowledge and will in many cases produce clumsiness and lack of confidence. The presence of a large refractive error will often remain undetected until a child begins to walk about, and perhaps until he begins to look at picture-books or goes to school. At this point it will be relevant to pose the question: *How early in life are glasses feasible?* From time to time one sees 1-year-old infants wearing spectacles, and occasionally these appliances are given to babies within a year of birth, but I believe that none should be prescribed for patients under 2 years old. Admittedly cases arise in which there are arguments in favour of spectacles for children under 2, but such arguments are outweighed by the obvious difficulties and disadvantages of wearing glasses so early in life.

Spectacles in children are often an essential item in the treatment of squint, and especially in the accommodative variety of convergent squint associated with hypermetropia. Astigmatism is often combined with hypermetropia in such cases, and many will exhibit a different level of refractive abnormality in the two eyes. *How often should children for whom glasses are necessary be retested?* It is a good thing to arrange that re-examination should be performed once a year, but there will be many children who will need to be reinvestigated at shorter intervals. When spectacles are being used as a major item in the treatment of squint and other forms of ocular muscle imbalance, their strength may from time to time require modification, even if there has meanwhile been no change in the basic refraction.

Should children wear their glasses constantly? Yes, if the unaided visual acuity is very defective. Another reason for constant wear is the presence of accommodative squint. In such cases it may later be possible to relax the rule, reserving the glasses for close work only. Children suffering from slight myopia may be able to get on comfortably without spectacles for most out-of-school activities, and wear them for seeing the blackboard, looking at films, etc. All prescriptions should clearly indicate whether or not the spectacles should be worn constantly.

Light metal frames are as a rule most suitable for children, and in the early years frames will best be supported by the sides of the nose. For 2-year-old children the ear-pieces usually have to be joined with a tape tied at the back of

the head. Unsplinterable lenses are advisable up to the age of about 8 years, and of course for older children as well when the spectacles are going to be used for cricket.

Patients of 14 to 40 Years

Adolescents with rapidly advancing myopia may for a few years need an annual test, but this interval can be considerably lengthened in the great majority of patients aged 14 to 40 years. It is quite wrong to assume, as many people do, that spectacles need to be changed at fixed intervals. Some people's refraction remains remarkably consistent for ten, fifteen, or even twenty years. Those who display greater variation do not necessarily change at a constant rate. In the course of a given year they may alter more than twice as much as they do during the preceding or succeeding period of three years. Adolescents should perhaps be re-examined biennially, but adults can usually go for longer than two years if their eyes are otherwise healthy, and if they have not recently been exhibiting rapid change. Five years may usually be allowed to elapse before such grown-up people come for another test. If there should be a considerable change before that time, the patient will probably notice new visual symptoms, and thus be prompted to seek earlier examination.

The role of spectacles in the treatment of muscle imbalance is relatively small among adolescents and adults. Therefore few of them will choose to wear glasses constantly unless their visual acuity is thereby sharpened. Young people with only moderate hypermetropia usually prefer to reserve spectacles for close work, because their accommodational reserve still enables them to see far objects clearly. As they approach the age of 40 they will become increasingly dependent upon spectacles for clear definition at all distances.

What are the chief symptoms which suggest that spectacles may be required? The cardinal symptom is blurred vision, which will be experienced by all those suffering from gross refractive errors. Myopia even in small degrees interferes greatly with the detailed appreciation of distant objects. Small amounts of hypermetropia may incite no symptoms in children and young adults. Indeed moderate hypermetropia is physiological in the early years of life, and requires no treatment unless it is associated with a disorder of ocular muscle balance. Another important symptom is proneness to ocular fatigue. Thus, for instance, a patient suffering from hypermetropia, especially if it were linked with astigmatism, might find that words on a page tended to run into each other, and that the act of reading became uncomfortable after a few minutes.

Headache is undoubtedly a possible symptom, but it must be emphasized that most headaches are not due to refractive errors. Patients are often sent for superfluous eye examinations "to exclude refractive error as a cause of their headache." When abnormality of refraction does substantially contribute to headache, it will often be found in association with ocular muscle imbalance, and the patient usually complains that his headache is provoked by long spells of close work. Headache unrelated to concentration of gaze is unlikely to be of ocular origin, and in many instances the history will supply a clue. Thus, for example, headache arising from congestion of the accessory sinuses may exhibit a regular time-cycle, or may show characteristic aggravation from temperature changes. Incidentally it is worth remembering that considerable refractive errors often come to light during the routine testing of people who have never complained of headache.

Patients over 40 Years

Those who are free from hypermetropia, myopia, and astigmatism will retain their distant visual acuity in middle life, assuming that their eyes are otherwise normal; but few of them on reaching the age of 50 can still thread a needle unaided or read small print by artificial light. Indeed, many of them require convex glasses for near work while they are in their forties. Some put off the day of yielding to

spectacles, lest they become too dependent upon these artificial aids. They should be told that they are engaged in a losing battle, because in fact the reserve of accommodation (focusing power) dwindles from childhood onwards. If it were a question of the ciliary muscle waning in strength, the need for reading glasses might well be postponed by dint of extra effort. The main reason, however, for accommodational failure is progressive rigidity of the human lens, which grows like an onion by successive superimposed layers, so that contraction of the focusing muscle no longer produces the alteration in curvature requisite for close work.

If their eyes are in other respects normal, presbyopes do not need to be tested every year. Until they reach the age of 60—by which time their accommodation is almost entirely gone—there is increase in the relative convexity of their spectacles is likely to be needed at intervals of two to five years, but wide variations occur between different patients, and even the same patient will often vary the speed of his refractive change at different epochs. Important alterations in refraction after the age of 60 are as a rule associated with changed relationship between the density of the nucleus (core) and cortex (outer layers) of the lens.

At the age of about 45, habitual wearers of spectacles find that their distance correction is no longer suitable for reading. Some of them will see small print better without their glasses. Let us imagine, for instance, a patient aged 55, with 2.5 dioptres of myopia. He will be able to see the 6/6 line of distant test-types with the aid of his glasses. If he had been free from distant refractive error, he would probably by this age have needed a pair of +2.5 spheres for near work, but this correction is exactly counteracted by his 2.5 dioptres of myopia. Therefore he will not need special reading glasses. He simply takes off his spectacles whenever he wants to scrutinize near objects.

With the exception of that minority of myopes who can manage without reading glasses, presbyopic patients suffering from other refractive trouble cannot use their eyes efficiently for all purposes unless they obtain either bifocals or else more than one pair of glasses. One often meets people reluctant to face that alternative. When the advantages of bifocals are explained to them, they are apt to expatiate on the failure of a friend to become adapted to this device. On the other hand, they resent the inconvenience of using two different pairs of spectacles. Sooner or later they must decide which of the two plans will suit them better, because one fact is inescapable: no single strength of glass will enable them to achieve their best visual acuity both for near and distant objects when once they have entered the presbyopic stage.

Patients over 60 seldom take happily to bifocals, because (a) they are less swiftly adaptable to a new form of appliance, and (b) the difference between their distance and near correction is well-nigh maximal, so that they are more likely to feel confusion when they look down through the lower—for example, the reading—part of the glass on stepping off a kerb or descending a staircase. This last disadvantage can be prevented by arranging for a continuation of the distance correction below the reading portion of the glass, but even so it is often too late for the patient to get accustomed to bifocals. Therefore it is advisable to begin bifocals at or before the age of 50, if the patient requires a distance as well as a near correction. Even if the distant vision is normal, bifocals are worth considering. Plane glass can be supplied for the upper part of the spectacles, and then a presbyope need not keep pulling off his glasses every time he wants to look up from his notes. Nor need he sit with his reading glasses sliding half-day down his nose. Bifocals are particularly valuable to presbyopic artists, medical men, barristers, and administrators occupied with interviews. Such people have need of a device enabling them rapidly to alternate between the scrutiny of far and near objects.

Trifocals are another useful type of spectacles for certain occupations. Between the near and distant correction is an area occupied by a lens of intermediate strength, whereby

a clear view can be obtained of objects about one metre away—for example, a music score. A certain amount of intelligent concentration is needed before the patient can fully appreciate bifocals, and naturally this generalization applies with even greater force to trifocals. Moreover, it goes without saying that accurate frame measurements and skilled fitting by the optician are especially important when spectacles incorporate more than one kind of correcting lenses. Numerous other special devices are available for people engaged in exacting tasks—for example, philately, watch-repairing, or the inspection of electric-bulb filaments.

Fallacies and Misconceptions about Spectacles

So many disquieting myths are apt to circulate concerning the visual function, not only among the lay public, but sometimes within our own profession, that it may be worth while to end with a few denials:

It is almost impossible to damage the eyes by long hours of reading and sewing, even if great fatigue is experienced at the time.

Spectacles worn by mothers and nursemaids do *not* make children squint.

Migraine is *not* due to refractive errors, and cannot be cured by the provision of spectacles.

Most headaches are not due to eye trouble.

Myopia *cannot* be cured by orthoptic exercises, or by electrical treatment, or indeed by any known method of therapy.

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BLOOD TRANSFUSION ACCIDENTS

The following statement on blood transfusion accidents is published at the request of the Consulting Pathologists Group Committee.

The war that spurred the development and perfection of radar, turbojets, and penicillin, and thus helped us have television, Comet travel, and potent antibiotics, left us with well-organized blood-donor panels whose continuing vital gifts, no longer required for wounded, are used for the needs of the sick. Blood is now provided for all medical, obstetrical, and surgical emergencies, and most hospitals have a blood bank or obtain blood from the bank of a near-by hospital within the group; these banks are supplied by the National Blood Transfusion Service. More recently the British Red Cross Society has stated that donors on its panels are available for giving fresh blood of all groups, at all hours, for planned or emergency work.

Benefits of Blood Transfusion

In addition to the immediate saving of life, blood transfusion, like improved anaesthesia, has made major thoracic surgery more easily possible and other major surgical procedures more safe. Again, apart from the operation period, those anaemic from chronic blood loss are now prepared for a necessary operation in shorter time; while, in the newborn, erythroblastosis is fairly regularly treated by replacement transfusion. Thus we have reached a point when we can say that the benefits of blood transfusion are as great in peace as in war.

The great boon that blood transfusion is may not be fully appreciated by the public: those who have benefited and

their relatives know, and that most generous and unselfish group, the donors who perform a great public service, they know; but to the general public a blood-donor session and the giving of blood in hospital are things remote. It is thus the more regrettable that a large newspaper-reading population should be introduced to the subject of blood transfusion by headlines that high-light almost every fatality. The incidence of such fatal cases is thus grossly exaggerated and needless alarm thus spread. The true incidence of death resulting from accidents in blood transfusion is not known for the whole country, but in one large hospital in the London area it has been of the order of one death in a period of six years, in which 13,000 bottles were transfused.

The Element of Risk

However, it must always be borne in mind that there is a risk attaching to blood transfusion and that every step must be taken to minimize the chance of causing death in the attempt to save life. Thus, since the risk has been stated as similar to that of uncomplicated appendicectomy, similar consideration should be given to, and plans made for, a blood transfusion as would be given to the question of opening an abdomen for appendicectomy. Always there should be regard for the need as evidenced by the haemoglobin level or the known blood loss.

There is an increasing demand for blood which tends more and more to exceed the supply; this suggests that there may be a certain measure of over-prescribing, which adds to the risks undergone by some patients and acts to the detriment of others who are really ill and require a life-saving transfusion. The three points at which a patient about to be transfused is placed at risk are in the *prescribing* of the transfusion, in the *grouping and matching*, and in the *giving*.

The request for blood ought always to be directly equated to the need. Thus it appears unjustifiable to place any patient at risk for one pint of blood; such cases would do well with a plasma substitute, because only blood volume can be involved when the loss is so small. In healthy young women with slight loss of blood from abortion, miscarriage, or at term the natural recuperative powers must neither be forgotten nor superseded.

Grouping and Matching

The blood bank at each hospital should be under the care of the hospital pathologist, whose responsibility it is to ensure that (i) the grouping of the patient and the matching of blood are done only by experienced technicians, resident pathologists, and/or resident housemen who have been trained and are thoroughly experienced in the methods, and (ii) satisfactory arrangements have been made for care of the bank and grouping and matching at night and at week-ends (see circulars R.H.B. 51/89 and H.M.C. 51/82). In this connexion hospital management committees should arrange that technicians, when on call, should be transported or given travelling expenses and paid for this emergency work.

For maximum safety in grouping and matching two things are essential—adequate time in which to do all the tests and the full relevant history of the patient. Most laboratories now have a special request form to be completed when blood is wanted. This form contains space for details of previous transfusions and any reactions to them and also for the obstetric history in so far as it relates to jaundiced babies and stillbirths. This information determines the additional serological tests that may have to be made.

It is not yet generally known that for the actual grouping and matching of blood for transfusion to be done thoroughly up to four hours may be required. The tests are no longer made on slides or tiles and in three to five minutes. The increasing frequency of transfusion of patients makes more than ever necessary full time for the interaction of cells and sera in ABO- and Rhesus-grouping and in compatibility testing. Thus two hours is the time of incubation (in tubes,

to avoid evaporation of the small quantities used); only by this means can A-group readings, Rh-grouping (anti-D), and the possible presence of immune iso-antibodies be clearly determined. Equally necessary is the matching of recipient's serum with donor cells suspended in saline at room temperature and, in parallel, suspended in 20% bovine albumin at 37° C. for a minimum of two hours and read microscopically. Another essential procedure is to make and stain a film of blood when a sample for matching is taken from the bottle; this permits detection of the rare instance of massive contamination with bacteria that flourish at 4° C. without causing visible change in the blood.

These methods are probably not yet fully adopted by all pathologists, but they ought to be, for only by using them can it be said that every possible precaution against misgrouping and mis-matching has been taken. In emergency, with suitable proved high-titre grouping sera similar procedures can be used and the time cut to 15 minutes for each test, but it must be clearly understood that while there is fair accuracy with the shorter method there still is risk of error. It may be mentioned that impatience on the clinical side has caused junior resident pathologists to make mistakes, some of which were fatal. Thus full understanding and co-operation on all sides are very necessary.

Giving the Transfusion

In the giving of the transfusion the matched blood should be handled as little as possible and used with the minimum of delay. Here, unless there is a simple yet rigid system of check, check, and counter-check, accidents can easily occur: already too many have. A good arrangement is that used in the hospitals of the North-east Metropolitan Region. Each bottle of matched blood has a coloured (according to the group) tie-on luggage label which bears the donor's bottle number and/or name, recipient's full name and ward, the date of matching, and the signatures of the persons who matched and checked the blood. A centrally situated refrigerator or cold-room (controlled at 4° C. to 6° C.) should be provided for such matched blood because ward refrigerators are too unreliable and the blood may be frozen or forgotten (if not used). The central matched-blood refrigerator should have a record of the contained blood in a book or on a sheet, giving as a one-line entry the patient's (recipient's) name and ward and the donor's name and/or bottle number, and each bottle removed should be signed for and the time and date of removal entered.

Blood should only be removed immediately before use, and only by a member of the medical staff, preferably by the houseman or anaesthetist who is to set up the transfusion. Neither the removal of blood from the refrigerator nor the administration (including the follow-on of bottles) should be allowed to be a duty of the nursing staff. On rare occasions it may be necessary for an orderly or nurse to collect blood from the laboratory as soon as matched, and then the messenger should take to the laboratory a note bearing the full name, age, and ward of the concerned patient (recipient), for names are too readily confused in verbal messages, especially over the telephone. Mistakes of this kind that proved fatal are on record.

The details on the luggage label tied to the bottle should be checked (a) with the bottle number, and also with the donor's name and/or bottle number and the recipient's name and ward, in the refrigerator-register entry at the time of removal, and (b) in the ward or theatre, with a nurse or other person as witness before the blood is given. The doctor should ensure that the patient named on the luggage label is the concerned patient about to receive the blood. Check, check, and re-check is common in laboratory procedures—for example, in reporting Wassermann reaction results—and it is surely not too much to expect the same when administering intravenously a "substance" to which there is no "antidote." Axiomatic though it is, it must be stated that blood matched for a patient is for that patient and none other.

Emergency Transfusions

In grave emergency, when compatibility tests cannot be done, unmatched blood reserved in the central refrigerator for emergency use in theatre, in the maternity wards, or by the maternity flying-squad should be used—group O Rhesus-negative blood for women and for men who have had previous transfusions, and group O Rhesus-positive blood for men who have not been transfused. But even in such cases it is essential that a sample of the patient's blood (as for the Wassermann reaction) be secured *before transfusion* is begun in order that the patient's own group can be determined later and the patient's serum used for further matching.

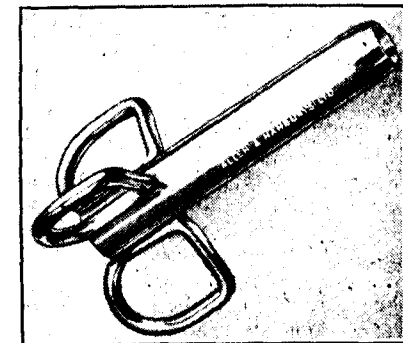
All this may read like a counsel of perfection, but these precautions can easily be taken, and in fact all the serological tests, the request forms, and bottle labels for identification are in universal use and many of the local blood-bank arrangements have been in operation in the North-east Metropolitan Region for almost two years—various procedures obtaining earlier were reviewed, discussed, some discarded, and the best retained. While domestic blood-bank rules may vary from place to place the general principles remain unaltered: those enunciated above have been evolved as the result of local near-accidents and from the reported fatalities.

Manifestly experience so dearly bought should never be purchased twice, yet there is danger that it may be paid for thrice or more unless pathologists and clinicians co-operate and, with the help of senior administrative medical officers of regions, close this sorry account.

Preparations and Appliances

TUBO-UTERINE IMPLANTATION REAMER

Mr. V. B. GREEN-ARMYTAGE, consultant gynaecologist, Hammersmith Postgraduate Hospital, writes: In the operation of tubo-uterine implantation for tubes occluded at the cornua, secondary to septic abortions, etc., it has been found that the punch previously advocated by myself¹ is too long and hence apt to wobble or slip from the fingers when making the necessary tunnel at the cornu, in line with the interstitial part of the tube. To remedy this I have devised, with the help of Messrs. Allen and Hammersley, a shorter, sharper, cheaper and steadier reamer here illustrated, with a lumen of either 7 or 9 mm., which combats all difficulty in these otherwise hopeless cases. Moreover, in order to assist the tube in adjusting itself to the smooth-cut channel, I thread the implanted tube from the fimbria through to the vagina with the finest of polythene tubing, which is pulled out in three to four weeks.



REFERENCE

¹ British Medical Journal, 1952, 1, 1222.

The Earl of Feversham has accepted the invitation of the Royal Sanitary Institute to act as president of the Health Congress which is to take place at Scarborough on April 27-30, 1954. An attendance of about 2,300 delegates and others is expected. Lord Feversham was chairman of the committee of inquiry into the voluntary mental health services which produced the Feversham Report in 1939.

Correspondence

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

Treatment of Acute Malaria

SIR,—I have read with much interest the excellent and balanced leading article on antimalarial drugs (*Journal*, August 1, p. 266). I have two minor criticisms to make. Chloroquine may act more quickly than quinine as a schizonticide (though I doubt if the difference is sufficient to be of great significance), but it is much more expensive—a point of no small importance in impoverished communities. Most of us will agree that there is little risk of precipitating blackwater fever with quinine therapy unless the patient has previously used quinine irregularly as a suppressant. Those who, like myself, experienced three malaria seasons in Macedonia in the 1914–18 war and have repeatedly seen the dramatic action of this drug when given intravenously to comatose cases will be unwilling to admit that it is completely outmoded by the synthetic schizonticides until these have been tried out in similar circumstances. As a suppressant, of course, it is both ineffective against a severe challenge and dangerous because of its tendency to predispose to blackwater fever. The second point is the statement that proguanil “is the only drug known to be a true causal prophylactic in *P. falciparum* infection.” In the last sentence of a recent paper Sir Gordon Covell¹ writes, “The action (of pyrimethamine) appears to be that of a true causal prophylactic against this species of parasite,” and from the data he gives this conclusion appears justifiable.

My main object in writing this letter is to comment on the article by Sir Gordon Covell and others (p. 258) and to suggest, in the light of ideas which have crystallized since his experiments were planned, a possible explanation of the discrepancy between Covell's results with pyrimethamine against the Madagascar strain of *Plasmodium vivax* and Coatney's results using the Chesson strain.

It has been conclusively shown that pyrimethamine, like proguanil,² acts on the asexual parasites of *Plasmodium* in the blood stream at the time of nuclear division.^{3,4} This observation is in conformity with its known action as an antagonist to one of the folic-folinic acid series, and no doubt has some relationship to the observation made by Jacobson⁵ on the action of aminopterin (a folic acid antagonist) on the dividing nucleus of cells in tissue culture. It is not unreasonable to postulate that, if pyrimethamine does in fact destroy the exoerythrocytic forms of the parasite, it acts by the same mechanism—that is, by interfering with nuclear division. The Chesson strain of *vivax*, used by Coatney, is an “early-relapsing” race of the parasite. By giving pyrimethamine over a period of 8 to 10 weeks an effective concentration of the drug is ensured at the time when the exoerythrocytic forms of this parasite, prior to producing erythrocytic infection, reach the vulnerable stage of nuclear division. Hence the so-called “suppressive cure” which Coatney achieved by this method and reported at the annual meeting of the American Society of Tropical Medicine and Hygiene (proceedings in the press). A glance at Covell's chart on page 258 reveals a very different picture. From this it is clear that the exoerythrocytic forms of the Madagascar strain can remain latent for 30 to 40 weeks. There is no reason to suggest that recurring schizogony of these parasites takes place in this interval, and, in the absence of such division, pyrimethamine is without effect when given at this time. Hence the relapses which occurred in Covell's patients. The remedy in infections with the late-relapsing strains of *vivax* might be to give a weekly dose of pyrimethamine between the tenth and twentieth weeks after the primary attack and again

between the thirtieth and fortieth weeks, but this suggestion is feasible only where the habits of the particular strain as regards relapse have been accurately defined. The important point, as brought out in your leading article, is that if further evidence confirms that pyrimethamine destroys exoerythrocytic forms it will, when taken prophylactically, prevent late relapses of benign tertian malaria.—I am, etc.,

London, N.W.1.

J. S. K. BOYD.

REFERENCES

- ¹ *British Medical Journal*, 1953, 1, 1081.
- ² Mackerras, M. J., and Ercole, Q. N. (1947). *Trans. roy. Soc. trop. Med. Hyg.*, 41, 365.
- ³ McGregor, I. A., and Smith, D. A. (1952). *British Medical Journal*, 1, 730.
- ⁴ Thurston, J. P. (1953). *Trans. roy. Soc. trop. Med. Hyg.*, 47, 248.
- ⁵ *J. Path. Bact.*, 1952, 64, 245.

SIR,—With reference to Sir Philip Manson-Bahr's letter (*Journal*, August 1, p. 284), I should like to assure the writer that I do not find myself “in a quandary regarding the effective drug treatment of malaria,” and that I do not advocate a proposal of “back to Methuselah” in the sense that synthetic antimalarials should be discarded in favour of quinine.

In my opinion the drugs of choice for the treatment of an acute attack of malaria in a non-immune subject are chloroquine, amodiaquine (“camoquin”), or mepacrine. I would use quinine only if none of these was available. As Sir Philip recalls in his letter, it was the routine use of mepacrine among our troops in prophylaxis as well as in treatment which banished malaria as a dominant factor in the war in the Far East. In the experience gained at Horton over the past 23 years, mepacrine administered in adequate loading dosage (a minimum of 6 tablets of 0.1 g. on the first day) generally has a more rapid action on *Plasmodium falciparum* than has quinine. This was particularly noticeable in the case of a European strain of this parasite with which a series of experiments were carried out in 1931.¹ With this strain quinine was not only less rapid in action than mepacrine, but was also entirely ineffective in the production of radical cure. Two of the patients in this series developed blackwater fever, and in each case quinine was considered to have been the exciting cause. Chloroquine and amodiaquine have an advantage over mepacrine in that while they are at least as rapid in action they do not produce yellow discoloration of the skin.

The sole object of my letter (*Journal*, July 4, p. 41) was to emphasize that, although both proguanil and pyrimethamine have been shown to be highly effective in the prophylaxis of malaria, neither of them is suitable for the treatment of an acute attack in a non-immune subject without reinforcement by some more rapidly acting schizonticidal drug.—I am, etc.,

Horton, Surrey.

G. COVELL.

REFERENCE

- ¹ James, S. P., et al. (1932). *Proc. roy. Soc. Med.*, 25, 1153.

The Backward Child

SIR,—Having left Columbus in the beginning of May and having been travelling during the last month, I have only recently seen my letter on the backward child and Dr. L. Crome's comments on it (*Journal*, April 25, p. 936, and May 16, p. 1108).

Dr. Crome states that the evidence gleaned from his brain-pathological material does not lend support to the theory that lesions in the geniculate bodies present the main cause of mental deficiency. He calls this theory “Dr. Gellner's hypothesis.” However, I never presented such a hypothesis. In the letter to which Dr. Crome refers I wrote that “pathological changes in the above-mentioned ganglia (the corpora quadrigemina and the corpora geniculata) and in their afferent and efferent tracts may play one of the most important roles in the causation of mental defect.” My topographical reference embraces the whole length of the visual and auditory pathways from receptor organ to cerebral cortex. This shows that my hypothesis is not primarily concerned with the actual anatomical level affected by the impairment, but with the circumstance that mainly or even exclusively disturbances affecting to some degree the integrations of the visual or the auditory system will lead to a mental defect. Both

of these exteroceptor systems possess two ganglionic relay stations in the midbrain, subserving apparently different integrative functions and promoting different aspects of visual or auditory reactions and experience.

The distribution of sensory impulses into two main channels in the midbrain, a sensory-somatic and another probably sensory-autonomic one, is demonstrated in the anatomical fact that both the optic and the auditory tracts divide in the midbrain to form two major branches: one ending together with kinesthetic fibres in the corpora quadrigemina, the other ending in the corpora geniculata of the thalamus. The discovery that the hypothalamus projects to the cortex via thalamic nuclei is to-day a well-established fact and by no means my hypothesis. I only hypothesized on the basis of findings of Le Gros Clark and others the existence of a direct hypothalamic connexion to the geniculate bodies. The dichotomy of visual as well as auditory functions in sensory-somatic and sensory-autonomic ones is able to explain satisfactorily most clinical features evidenced in mentally handicapped children. Such a dichotomy is supported by observations in brain physiology which we owe mainly to Pavlov and his school, as Dr. Crome rightly points out, but also to the work of Dusser de Barenne and Warren McCullough. It is likewise borne out by experimental psychology and furthermore by a large number of educational studies.

Dr. Crome writes that in view of his pathological findings it is “impossible to agree” with my theoretical postulates and “hardly necessary to discuss” my theory. I am, however, unable to discern in his letter what he has actually found in his material which contradicts my hypothesis. Apparently he has at present investigated his material in a fairly gross macroscopical way only. Has he thoroughly examined the telencephalon, mesencephalon, and diencephalon in all his cases, and is he furthermore so well acquainted with the normal anatomy of the brain-stem as to be able to detect immediately minor pathological changes in its structure? He has mentioned changes in the optic tracts and the lateral geniculate bodies. But has he observed—to mention only a few—the not infrequent absence of the striae acusticae (which correspond to the optical tract) from the floor of the fourth ventricle or the occasional lack of a tract, usually emanating from the medial geniculate bodies and known as “Gudden's commissura”? Has he in a number of cases missed the bigeminal nuclei which have close connexions with the inferior colliculi or has he even been confronted with a complete absence of the colliculi themselves?

I have witnessed all these and other subcortical changes repeatedly in the necropsies of more than 200 brains, which Dr. Philipp Schwartz investigated while I was working with him in Wrentham State School, Mass. Dr. Schwartz's extensive pioneer work concerning brain injuries in the newborn is well known to brain pathologists. In June, 1951, he summarized his experiences in a lecture, given to a medical audience: “My observations have all but convinced me that we shall find the key to many yet unsolved problems regarding the pathogenesis of mental deficiency in primary pathological changes of the brainstem.”

This statement does, of course, not imply that alterations in the brainstem were the only changes which we found in the cerebrums of aments. I wrote in my previous letter: “These disturbances (of lower levels) will deprive the cortex of necessary sensory-somatic and sensory-autonomic impulses.” In the language of the brain pathologists that means: “Lesions in subcortical areas will produce secondary cortical atrophy with shrinkage of the white matter, reduction in the number of nerve cells in the protective layers of the cerebral cortex, and consequent loss in weight and size of the brain.” These findings correspond exactly to “the most common structural changes” referred to by Dr. Crome.

Many years ago Dr. Stewart described large numbers of similar findings. But he stressed at the same time the enormous frequency of partial optical atrophy in aments. The coincidence of these phenomena can best be explained by the theory of primary subcortical impairment in either the visuo-somatic or the visuo-autonomic sphere. Such an impairment would result in lack of development in the appropriate projective layers of the cortex and in retrograde partial atrophy of the visual pathways. For further evidence Dr. Crome may also consult the excellent publications of Dr. Norman, Superintendent of Stoke Park Colony, Bristol. Dr. Norman found histological changes of the lateral geniculate bodies in a considerable number of his necropsies, by no means—as Dr. Crome—only in the rare cases of microphthalmia. He regards the accompanying cortical changes in most cases as secondary results of subcortical impairment.

Lastly, I completely fail to understand why Dr. Crome accuses my suggestion that the central integrations of our

most important senses are specially related to the development of intelligence. After all, the statement made about 300 years ago by the philosopher Leibniz still holds true: “*Nihil in intellectu est quod non fuerit prius in sensibus.*”—I am, etc.,

London, N.W.3.

LISE GELLNER.

Infections in Childhood

SIR,—May I comment in one letter on three interesting articles in your issue of July 25?

The staphylococcal infections in maternity hospitals described by Dr. John O. Forfar *et al.* (p. 170) are very serious. Yet even to-day there are hospitals where newborn babies are put into crowded nurseries, the cots nearly touching, and are bathed in a common basin. “Drops” and gentian violet are to hand for the sticky eyes and septic fingers which occur without arousing surprise. In such communal living conditions the individual labelling of towels and cot blankets is a rather inadequate ritual. A patient with a breast abscess is usually isolated, but it is rare for her contacts to be swabbed, and her baby may remain in the common nursery. I recently saw a child which had had styes, boils, and whitlows for the three years since it left the maternity hospital with a sticky eye it caught there from other babies. For the last two years the mother too had had boils and was in the nick of time prevented from taking up a job in a baby clinic.

Maternity units could with advantage be much stricter about the spacing of nurseries, the avoidance of common utensils, and the exclusion of dangerously infected persons. Neither patients nor staff should be admitted if they carry such patently virulent staphylococci that they suffer from boils, styes, or whitlows.

Intestinal cross-infections could be reduced; a practical stool for individual bed-pans has now been designed.¹ The faeces of an expectant mother could be examined bacteriologically, perhaps at the time of the last antenatal visit. It is clear from the article by Drs. William McNaught and John S. Stevenson (p. 182) that this should now include a routine search for the gastro-enteritis strains of *Bacterium coli*.

Finally it would have added to the comprehensiveness of Professor Norman B. Capon's interesting review of indigestion in childhood (p. 197) if attention had been drawn to the frequency with which the common “diarrhoeal” infections may give rise to atypical symptoms. Shigellae, salmonellae, serospecific types of *Bact. coli* and giardia may all cause dyspepsia, fever, pains, and headaches, and may be present without diarrhoea; sometimes loose stools do occur, but irregularly at intervals of several days. Symptoms may persist for weeks or only for hours. In the investigation of a case of indigestion it is helpful to have the faeces examined microscopically, culturally and for blood.—I am, etc.,

London, N.9.

M. E. M. THOMAS.

REFERENCE

- ¹ Davey, A. P. C. (1953). *Lancet*, 2, 142.

Respiratory Paralysis in Poliomyelitis

SIR,—At a recent meeting at the Ministry of Health, reported in the *Journal* of May 30 (p. 1216), a discussion took place on a new method for treatment of respiratory paralysis in poliomyelitis, as applied during last year's epidemic in Copenhagen. It was evolved by Dr. B. Ibsen and described by Professor C. H. A. Lassen.¹ Whereas until then artificial respiration was performed in these cases through passive expansion of the thorax from without by an iron lung type of respirator, with or without tracheotomy, the new method provides for artificial ventilation by means of rhythmic inflation of the lungs through an endotracheal tube passed into a tracheotomy opening. The Copenhagen results appear to be very encouraging, the mortality having been reduced from 80% to 40%.

In view of some difficulties and disadvantages of the method which were mentioned by Professor Lassen as well

as by speakers at the Ministry of Health discussion, I should like to suggest a simpler and cheaper way to achieve the same results—that is, the replacement of the apparatus described by Lassen by the Oxford vaporizer, which, in this case, would not be used for ether anaesthesia, but to apply artificial respiration. The method has the following advantages.

The Oxford vaporizer when fitted with a Salt valve (a non-return valve which can be closed during inflation by depressing a spring-loaded button) permits artificial ventilation without rebreathing. As no soda lime is used, there is no danger of aspiration of particles nor of heat retention by the patient, caused by an overheated canister. Besides, 30s. a day per patient, the cost of the soda lime, will be saved. Any small amount of CO₂ which may accumulate in the corrugated rubber tube of the machine by a slight reflux of expired air can be removed by flushing the tube with air once or twice every few minutes—i.e., by compressing the harmonica bag with the Salt valve open.

The Oxford vaporizer can be used either with air alone or with a variable air-oxygen mixture, the oxygen to be led in through the tap provided for it. Instead of giving a fixed 50-50 nitrogen-oxygen mixture as used in Copenhagen, the oxygen content can be adapted to the patient's needs. This will also ease the "weaning" from artificial ventilation back to spontaneous respiration, as one can reduce the oxygen gradually instead of changing it suddenly from 50% of the fixed mixture to the 20% of air. The cost of the nitrogen-oxygen mixture will be saved against the much lower cost of pure oxygen.

Under European conditions air does not require an additional humidifier, while compressed gases are too dry for prolonged use without added water vapour. If much additional oxygen is used, or if the air is very dry, the ether container of the vaporizer should be filled with water and the ether control tap fully opened. The mixture will then be driven over the water and will absorb sufficient moisture to prevent the tracheo-bronchial secretions from drying up. The spring within the harmonica bag will resist the application of too much pressure during inflation, and the slow re-expansion of the bag will ensure a sufficiently long expiratory period.

The apparatus is foolproof. Should added oxygen run out unobserved, the inflated air would still provide for the minimum oxygen requirements. This safety, together with the uncomplicated working of the vaporizer, will allow for the employment of untrained personnel. They have to be taught only to compress the bag a certain number of times per minute, varying with each patient, and to press down and release the button of the Salt valve simultaneously with compressing and releasing the bag. Thus, one medical attendant can supervise a number of patients, adjust the oxygen mixture, and attend to suction, postural drainage, and any other treatment.

No alterations of the Oxford vaporizer are required, apart from providing a Salt valve with each machine.—I am, etc.,

Jerusalem.

LUISE WISLICKI.

REFERENCE

¹ *Lancet*, 1953, 1, 37.

. The bellows previously incorporated in the Oxford vaporizer are now available separately as a small hand unit, which was recently described in the *Journal* (July 25, p. 202) by Professor R. R. Macintosh. On the same page Dr. W. W. Mushin described the Cardiff inflating valve, which has been designed for use with the Oxford bellows.—Ed., *B.M.J.*

Post-inoculation Poliomyelitis

SIR.—Statistical inquiry is only one of the methods by which we seek to acquire knowledge, and, moreover, is one that is notoriously full of pitfalls. In medicine, we have always gained much of our knowledge through the traditional practice of clinical observation aided by the application of reason. For instance, it does not require a statistical inquiry to show that streptomycin is a strong potential remedy against tuberculosis. The timely use of the drug in a single case of miliary tuberculosis so alters the clinical state of the patient as to demonstrate its therapeutic value much more clearly and promptly than a survey by questionnaire and a mathematical analysis of the returns of many individual observers.

Doubtless the South Tyneside poliomyelitis epidemic of 1952 would have yielded many more cases of post-inoculation poliomyelitis if intramuscular inoculations of prophylactics had been allowed to continue, but I would not care to expose any child during an epidemic of poliomyelitis to a risk of permanent disability.

The evidence which I submitted (*Journal*, July 11, p. 66) on the relation between inoculation and poliomyelitis was circumstantial. It depended on a comparison of the incidence of paralytic poliomyelitis in two groups of children being validated by other considerations, such as the frequency and sites of paralysis in the two groups of patients, its severity in the inoculated arms as compared with the effects of the natural disease when it implicated the arms, and the time intervals between inoculation and onset of symptoms. For me the clinical facts observed had a cumulative effect which led to conviction. Finally the facts confirmed the clinical experiences of London and Melbourne.

I cannot see any difference in meaning between the statement quoted with approval by Mr. P. G. Gray (*Journal*, July 25, p. 223) that "the main effect of recent immunization is to add an additional paralysis site," and my conclusion that "there was no doubt of the increased risk to a child of developing a paralytic attack of poliomyelitis as a result of intramuscular immunizing injections." Although I cannot follow the implications of the statistical test proposed by Mr. Gray, I would like to point out that his table of immunization sites is not valid for the Gateshead area, where, out of 1,000 consecutive inoculations of prophylactics in 1951, 776 were given in the left arm, 34 in the right arm, 175 in the buttocks, and 15 in the thighs. This distribution of sites of injection is in very close agreement with the sites of maximal paralysis in the 10 inoculated patients who suffered poliomyelitis not earlier than 10 days after the last injection (left arm 7, right arm 1, legs 2), and completely dissimilar to the sites of paralysis in the 60 paralysed patients among the 130 non-inoculated persons who suffered from poliomyelitis. In these, leg paralysis occurred in 42 and arm paralysis in 21.

In answer to Dr. Guy Bousfield (*Journal*, August 1, p. 285) I would like to state that the diphtheria prophylactic involved in the cases of post-inoculation poliomyelitis was A.P.T. (Burroughs Wellcome) as issued officially by the Ministry of Health. The pertussis vaccine used in 1948 was the Glaxo product containing alum, and the combined prophylactic against diphtheria and whooping-cough was either the product now called absorbed diphtheria/pertussis prophylactic (Glaxo) or the Parke, Davis equivalent, both of which contain alum.

On resuming diphtheria and whooping-cough prophylaxis after the poliomyelitis epidemic we adopted the suspended diphtheria pertussis prophylactic (Glaxo), and the local authority medical staff give it by the subcutaneous route.—I am, etc.,

Gateshead.

JAMES GRANT.

Inoculation Technique

SIR.—I read with great interest the valuable article by Dr. James Grant on post-inoculation poliomyelitis (*Journal*, July 11, p. 66).

Since the early days of immunization I have always used the gluteal route, and for this totally different reason. At that time I was surprised at the frequency with which many very young children started to whimper and cry when they were brought to the surgery for their second and third monthly injections. Very clearly they could associate me and my surroundings with a very painful experience, even at this tender age. This set me thinking—was I unwittingly sowing the seed for an increase in the number of highly strung nervous children with their accompanying bed-wetters and asthmatics? I decided I might be, and so changed my methods.

The mother now places her child across her lap face downwards, and the gluteal region is exposed. I now enter the room, make the injection, and quickly disappear. The child howls, is quickly upturned, but sees no one but his mother. He quickly forgets the pain which he thinks she has administered, for that is dwarfed by her constant love and care. So he comes back for the second and third injections with no "memories."—I am, etc.,

Gateshead.

A. MACARTHUR.

Manual Methods in General Practice

SIR.—I would like to reply to the very helpful letters on manual methods in general practice (*Journal*, July 25, p. 222).

Dr. P. Hopkins mentioned the psychogenic backache. This is quite a common trouble, as explained by Dr. J. P. Spillane at the Cardiff Plenary Session on "Fibrositis," and I agree with him, and mentioned the method of examination in my article (*Journal*, July 4, p. 18). I strongly endorse Dr. Hopkins's last sentence referring to examination of the "whole patient and not just the part that hurts." Examination for backache is carried out literally from "head to toe," and for armache from head to finger-tips. This is essential to avoid missing tuberculous caries or secondary deposits in the spine, or a cervical disk protrusion giving rise to pain in the arm. I cannot, however, agree with Dr. Hopkins's estimate that the proportion of total patients seen who require physiotherapy is 5%. First, he has omitted any cases of arthritis of the hip, shoulder, or knee, cases of strain of the coronary or lateral ligaments of the knee, or the chronic sprained ankle. Secondly, he has seen eight cases diagnosed as prolapsed disk in six months. This is hard to believe, since I see many more than that number every week. I note that 50% of his eight cases had operative treatment or plaster-jacket treatment. I can only remark that during the past three years I have not had one case operated on or encased in plaster.

Dr. R. Howard raised the one big snag—namely, payment. A great deal of work is done free by me and my physiotherapist. Not being recognized as a consultant in the National Health Service, I cannot be paid by the executive council and I cannot charge my patients (N.H.S.). I feel the treatment is so necessary that I am content with giving something for nothing.

Dr. T. Hambly's letter points out the weakness in our medical education. I am sure that before this work can be successfully carried out by general practitioners many courses will have to be arranged at St. Thomas's Hospital, under the guidance of Dr. Cyriax, and one general practitioner from every partnership should attend. We owe it to the patients who trust us to give them the best and earliest treatment practicable.—I am, etc.,

Hoddesdon, Herts.

R. BARBOR.

Cerebellar Dysfunction

SIR.—I must thank Dr. J. O. Newman (*Journal*, July 25, p. 223) for his interest in my medical memorandum (*Journal*, July 11, p. 83). I have to inform him that the ataxia so noted in the case report was indeed cerebellar ataxia, which was, of course, what made the case so unusual.—I am, etc.,

Glasgow.

BASIL SELTZER.

Three Testicles

SIR.—I can appreciate the gentle jest of my very old friend Mr. McNeill Love in resurrecting an anonymous mediaeval Pope and recording his alleged reaction to an anatomical conundrum (*Journal*, July 18, p. 145); but it is a pity to let the doctor who certified that the applicant had three testicles remain unhonoured. Medical history would be brightened if my friend could look up the original documents for an addendum to his admirable article on scrotal swellings.—I am, etc.,

London, W.1.

W. J. O'DONOVAN.

Regional Service for Diabetics

SIR.—It will no doubt be of great interest to those concerned with the care and welfare of diabetics to read (*Journal*, July 18, p. 160) that the Central Health Services Council has drawn up plans for a regional service for diabetics, and that the proposed centres will amongst other activities provide for "the training of patients in how to live with their disability."

The British Red Cross Society will be particularly glad to know of this development, for in 1946 the Society, in conjunction with the Diabetic Association, set aside 50 beds for that very purpose in part of the British Red Cross

Society's Auxiliary Hospital, Burley-on-the-Hill, Rutland, which I think I am correct in saying was the first undertaking of its kind in this country. Patients who had but recently been diagnosed as suffering from diabetes were there taught the diabetic way of life, as well as the use and administration of insulin and the preparation of suitable food. In addition to this instruction they had the benefit of meeting others suffering from the same complaint and were helped to regard the unusual as almost the usual, thus conditioning them for an altered life in the outside world and raising their morale. Burley-on-the-Hill was taken over on the appointed day in 1948 by the Ministry of Health, but it continues to give the same encouragement and help to diabetics as was provided originally by the British Red Cross Society.—I am, etc.,

London, S.W.1.

H. A. HEWAT.

Primary Biliary Cirrhosis

SIR.—We would like to comment on the article by Drs. H. G. H. Richards and C. B. S. Fuller on "Primary Biliary Cirrhosis" (*Journal*, July 4, p. 23). The following case report emphasizes the importance of awaiting post-mortem proof before accepting the diagnosis of primary biliary cirrhosis.

A married woman became jaundiced in July, 1951, at the age of 55. There was no relevant previous history. Investigation showed that the jaundice was of obstructive type. Mr. J. D. T. Jones performed a laparotomy, but could find no evidence of extra-hepatic obstruction. Liver biopsy showed biliary cirrhosis. The histological picture was the same as that described by Drs. Richards and Fuller. The patient remained intensely jaundiced until her death ten months after the beginning of the illness. Later both liver and spleen were enlarged together with ascites and a haemorrhagic state. Despite her extraordinary colour she felt well until the terminal phase of her illness. Post-mortem examination carried out by one of us (P.S.T.) revealed bile-duct carcinoma involving the hepatic duct in the porta hepatis. The tumour was only 2 by 1 cm. in dimension. There was also a small nodule 4 mm. in diameter in the cystic duct at its junction with the hepatic duct. The common bile duct was normal.

It is evident, therefore, that biopsy proof of biliary cirrhosis in combination with negative laparotomy findings does not exclude the presence of a small tumour of the hepatic duct.

We are grateful to Mr. J. D. T. Jones and Dr. H. A. Dewar, who had this patient under their care, for permission to publish this case.—We are, etc.,

J. W. PLATT.

P. S. TWEEDY.

Newcastle-upon-Tyne

Dr. Johnson as Scientist and Patient

SIR.—Your report of the B.M.A. Popular Lecture given by Sir Russell Brain on Dr. Samuel Johnson (*Supplement*, July 25, p. 62) prompts me to suggest that the truth behind the odd behaviour of the great lexicographer is to be found in the pages of *Lavengro*, by George Borrow. In chapters 64-7 is a most vivid account, obviously based on fact, of the author's brief sojourn with a country gentleman afflicted with compulsive neurosis. The sufferer confides in Borrow as follows: "Suddenly, I found myself doing that which even at the time struck me as being highly singular; I found myself touching particular objects that were near me, and to which my fingers seemed to be attracted by an irresistible impulse . . . a mysterious dread hanging over me till I had given way to it." As Borrow sympathetically observed to his host, it was the warding off of the "evil chance." I myself well remember an unfortunate school contemporary who, when walking in the street, was frequently compelled to turn round and round—top fashion—to the no small embarrassment of any chance companion. In the same way Dr. Johnson, when escorting poor blind Mrs. Williams, was obliged to leave her floundering while he carried out the gyrations imposed upon him by that dread, inexorable power.—I am, etc.,

London, E.1.

J. P. ENTRACT.

Obituary

G. E. VILVANDRÉ, M.R.C.S., F.F.R.

Dr. G. E. Vilvandré, consulting radiologist to the London Hospital, died at his home at Redbourn, Hertfordshire, on July 26 at the age of 71.

George Ernest Vilvandré was born in Paris on May 12, 1882. It was at his own wish that he was educated in England, and although very fond of his native country he never returned there to live. In 1903 at the age of 21 he became a naturalized British citizen. Deciding to study medicine, he entered the medical school of the London Hospital, qualifying in 1910. After resident appointments at the London and Poplar Hospitals and at the Chelsea Hospital for Women he went into general practice in Staplehurst, Kent. During the 1914-18 war Vilvandré was in France as a medical officer in the R.A.M.C., one of his duties being that of radiologist to the 16th General Hospital and Guildford Military Hospital. It was then that he interested himself in the movement of metal foreign bodies in the brain, a subject on which he wrote. When he relinquished his commission in the Army he also gave up his general practice to work with the late Dr. J. H. Sequeira in the skin department at the London Hospital, where he carried out much of the superficial x-ray therapy and became expert in the radiotherapy of ringworm. Later he took charge of the Poplar ringworm clinic. Rightly he stressed the value of an appreciation of the dose of x rays reaching the skin and the need of accurate estimation of it, both in therapy and in diagnosis. His interest was not confined to radiotherapy, and in the diagnostic department his scientific approach, accurate work, and co-operation with the members of the medical and surgical staff at the London Hospital brought him recognition.

In 1922 Vilvandré was appointed assistant radiologist to the London Hospital, the late Dr. S. Gilbert Scott being his chief. His great interest was in gastro-intestinal work, which at that time was in its fairly early stages. He realized that it was only in the operating theatre and the post-mortem room that his radiological observations could be checked and proved, and so he became a regular attendant in those departments. Working with such men as Sir James Walton and the late Mr. James Sherren, he had all the cases and co-operation he could wish. He did a very great deal to put the radiological diagnosis of gastro-enterological conditions in its present position. Although gastro-enterology was his chief interest, radiotherapy had a definite place in his heart, and it was due to him that the first deep-therapy apparatus was installed at the hospital. In 1930 he became radiologist to the London Hospital, and he was appointed to the consulting staff when he retired in 1942, in which year he was elected a Fellow of the Faculty of Radiologists. He continued in private practice and was radiologist to St. Albans Hospital until he finally gave up work about a year ago.

Vilvandré was well known in radiological circles. He served on the council of the British Institute of Radiology; he was president of the Clinical Section of the Royal Society of Medicine from 1947 to 1949; and he was a prominent figure in the Medical Society of London, of which he was honorary secretary from 1941 to 1943 and vice-president from 1945 to 1947. He was also a foreign correspondent of the Société Médicale des Hôpitaux de Paris.

George Vilvandré was always ready to assist a junior, and anyone who suffered misfortune could depend on him for help and sympathy. This was especially evident in his very great kindness to his patients, particularly to those whom he was treating with x rays. His cheerful presence and kindly advice and help will be remembered by all who worked with him. He enjoyed teaching—he was lecturer in radiology in the London Hospital Medical College—and many generations of students will gratefully remember his informal demonstrations. He leaves a son and a married daughter. He had the great misfortune to lose one daughter, a nurse with the British Forces in the East, by enemy action during the last war.—M. H. J.

KARL BREMER, LL.D., M.B., B.S.

Dr. Karl Bremer, Minister of Health and Social Welfare in the Union of South Africa, died on July 19 at the age of 68.

Karl Bremer was born at Hopefield, Cape Province, on April 27, 1885, and was educated at Wellington and at the Universities of Capetown and Stellenbosch, where he obtained a science degree in 1903 and won the Victoria scholarship which admitted him to London University for a six-years medical course. At St. Bartholomew's Hospital, where he was a student from 1904 to 1908, he was an active member of the Rugby club. He took the London degrees of M.B., B.S. in 1909, and, after holding a resident post at Bart's, he continued his postgraduate studies in Berlin before returning to South Africa. From 1910 to 1918 Dr. Bremer was in general practice at Cradock, Cape Province, and he then became the first medical inspector of schools under the Cape Provincial Administration. Within a year, however, he was back in general practice, this time at Graaff Reinet, also in Cape Province, where he remained until the early 'thirties, when he decided to specialize in diseases of the ear, nose, and throat, finally settling in consultant practice at Capetown in 1934.

Bremer was always interested in politics, and in time he became a prominent member of the Nationalist Party. At Cradock he was for a time secretary of the local branch of the South African Party, and later he became provincial councillor for Graaff Reinet. In 1924 he entered the South African Assembly as the representative of Graaff Reinet. Finding, however, that he could not do justice to his medical practice and to his public responsibilities at the same time, he resigned his seat in 1925. Nevertheless the pull of politics still possessed him, and so, in 1929, he offered himself again as a candidate at the General Election and was elected. He retained the seat at the 1934 and 1938 elections; in the "khaki" election of 1943 he transferred to Stellenbosch, which he won from the United Party candidate after a hard fight. From 1933 to 1949 he was the provincial chairman of the Nationalist Party in the Cape.

Dr. Bremer was an active and forceful politician, though he did not make politics his whole life. When in office he consistently endeavoured to broaden the scope of the Union's health services. In March, 1948, he announced that he did not propose to stand at the then pending General Election on account of ill-health, and in the following July he became chairman of the board of management of the Diamond Producers' Association. In 1949, however, he again returned to politics as a member of the Senate, this time with his

Party in power. The crowning point in his career came in 1951, when he succeeded the late Dr. A. J. Stals as Minister of Health and Social Welfare.

Before the Medical Association of South Africa (British Medical Association) became an independent entity in 1945 Dr. Bremer was an active member of the B.M.A. in South Africa. He was president of the Cape Midland Branch from 1927 to 1929; chairman of the Graaff Reinet Division in 1929-30; and chairman of the Capetown Division in 1937-8. He was elected a member of the South African Medical Council in 1934, in succession to Dr. Stals, resigning from the chairmanship of the council in 1951 when he became Minister of Health and Social Welfare. Earlier this year the University of the Witwatersrand conferred on him the honorary degree of LL.D.

E. L. HENDERSON, M.D., F.A.C.S.

We record with regret the death of Dr. Elmer L. Henderson, a former President of the World Medical Association and of the American Medical Association, at his home at Louisville, Kentucky, on July 30 at the age of 68.

Elmer Lee Henderson was born at Garnettsville, Kentucky, on March 23, 1885. He entered the medical profession the hard way, for he left his father's farm in 1902 to continue his education, paying his expenses by working in a highly varied series of occupations. In 1909 he graduated in medicine at the University of Louisville, and two years later established himself in surgical practice at Louisville, where he remained until his death, except for the period of his service in the war of 1914-18. His reputation as a surgeon spread far beyond his own medical school at Louisville, and among the honours which came his way were the presidency of the Southern Medical Association and of the South-eastern Surgical Congress. He was an honorary Fellow of the International College of Surgeons. In 1942 he was appointed a special surgical consultant to the Air Surgeon's Office, U.S. Army. Another post he held in the second world war was that of area chairman of the procurement and assignment service for physicians. In the campaign before the Presidential election last year he was chairman of the National Professional Committee which supported Mr. Eisenhower.

For many years Dr. Henderson was one of the prominent figures in the American Medical Association. Elected in 1937 to the House of Delegates, the policy-making body of the A.M.A., he was a member of the Board of Trustees from 1939 to 1947, and chairman from 1947 to 1949. When, in 1948, the association decided to launch a national campaign against "socialized" medicine he was appointed chairman of the co-ordinating committee, a task he undertook with vigour. Two years later he was elected President of the American Medical Association, and he had a most successful term of office. In the same year he followed Dr. Charles Hill as President of the World Medical Association, to the council of which he had been elected in 1948. In recent years he had travelled widely all over the world.

VICTOR BONNEY, M.D., M.S., F.R.C.S., F.R.C.O.G.

The obituary notice of Mr. Victor Bonney was printed in the *Journal* of July 11 (p. 99). We are indebted to Dr. GEORGE W. KOSMAK, advisory editor of the *American Journal of Obstetrics and Gynecology*, for

the following appreciation: The sad news of the passing away of Victor Bonney, as announced in your *Journal* of July 11, will prove a great shock to his many American friends and colleagues. He endeared himself to them on his visits to this country, and will be remembered by his many contributions to the literature of gynaecologic surgery. Victor Bonney was an outstanding physician and a friendly person whom it was a privilege to know personally for many years.

We are indebted to a former partner of Dr. T. B. Sellors, whose obituary notice appeared last week, for the following appreciation: Dr. Sellors's kind and courteous manner, together with a sympathetic understanding, quickly gained the confidence of his patients. His careful examination, thoughtful treatment, and especially his quiet encouragement often restored health more quickly than could normally be expected. Throughout his busy life in practice he found time to keep in touch with the skin department of the Middlesex Hospital, and the knowledge he acquired was much sought after by his colleagues. He was frequently called into consultation by them, not only on skin diseases, but also on other medical problems. Among his outside activities was Freemasonry. He was a keen member of the Crowstone Lodge, of which he was a founder member. He was always fascinated by fishing, and was never happier on his holidays than with his rod and line.

Dr. JOHN COWPER died at his home at Shanklin, Isle of Wight, on June 28, only a week before his 92nd birthday. Born on July 5, 1861, John Cowper received his medical education at Edinburgh University, where he graduated M.B., C.M. in 1887. After postgraduate work in London, he settled in Shanklin in 1889 and did not retire from practice until 1938. During that half-century he was for many years medical officer of health for Shanklin, and he also gave devoted service to Shanklin Hospital. In addition, he was surgeon to the Royal National Hospital for Diseases of the Chest, Ventnor, to the Isle of Wight Mental Hospital, Newport, and, during the war of 1914-18, to the auxiliary hospital at Gatcombe. As long ago as 1914 his colleagues paid tribute to his ability and integrity by electing him president of the Southern Branch of the British Medical Association. With all these activities Dr. Cowper still found time to interest himself in natural history and to indulge in his favourite recreation of shooting.

T. W. M. writes: It is as a surgeon and as a man that John Cowper will be remembered. Always interested in the surgical side of his chosen profession, he practised his art with great skill until 1926, when he handed over his surgical practice to the late Mr. J. A. Gaynor, who predeceased him by a few months. In his time there can have been few more capable surgeons in the provinces, and so much was his ability recognized and valued that his patients subscribed to build two small hospitals in Shanklin in the early years of this century. As one who was fortunate enough to be his partner during the last 12 years he was in active practice I was able to watch his work with the greatest admiration. As a man he was an inspiration to all who knew him, most upright, honourable, and lovable. We who are left behind should be grateful for his example.

One of Birkenhead's oldest and best-known general practitioners, Dr. W. R. FLOYD, died at his home at Oxton on June 29 at the age of 86. He had been in active practice for nearly 60 years. William Robert Floyd was born at Stalybridge, Cheshire, on May 8, 1867, the second son of the late Rev. Thomas Floyd. His father died when he was 10 years of age, and he was educated at St. Edmund's Clergy Orphans School, Canterbury, where he was a distinguished pupil and a formidable cricketer. From school he went on to Clare College, Cambridge, graduating B.A. in 1888, and four years later he qualified in medicine by taking the

diploma of L.S.A. In 1894 he obtained the degrees of M.B., B.Chir. After qualification Dr. Floyd held the appointment of house-surgeon at the Liverpool Royal Infirmary and then went into practice in Birkenhead with his father's cousin, the late Dr. T. S. Floyd. As the years passed Dr. Floyd became a prominent and respected figure in the life of the town, and was appointed to the honorary medical staffs of the Borough and Maternity Hospitals. He was chairman of the Birkenhead and Wirral Division of the British Medical Association in 1940-1; he served on the local medical war committee during the whole of its existence; and he was elected the first chairman of the local medical committee under the National Health Service Act of 1946. A past president of the Birkenhead Medical Society, he was elected a life member of the society in 1950 as a token of the esteem in which he was held by his fellow practitioners. In addition to his extensive practice Dr. Floyd always maintained a great interest in sport, being wicket-keeper for Birkenhead Park Cricket Club for many years, a life member of the Rugby club, and he played tennis and golf regularly in summer until advancing years reduced him to bowls. He was always known as "Dr. Willie" to his many old patients, and the large attendance at the funeral service showed how much he was liked by them all. His family life was overshadowed by much sorrow. His wife, formerly Miss Madge Rhodes, of Huddersfield, died in 1938, his two daughters died in childhood, one from diphtheria and the other from meningitis, and his elder son was killed in 1918 while on his first solo flight in the Royal Flying Corps. He is survived by his other son, Major G. T. Floyd, to whom we offer our sympathy.—H. C. W. B. and D. J.

Mr. F. COURTENAY MASON, who practised as an oto-rhino-laryngologist in London, died suddenly at his home at Hampstead on July 5 at the age of 62. Francis Courtenay Mason began his student life under adverse circumstances, and in consequence he became a very hard worker. After graduating B.A. at London University he won an entrance scholarship to the Middlesex Hospital in 1912, and followed this success by winning a second-year exhibition in 1914 and the Hetley clinical prize and the junior Broderip scholarship in 1916, in which year he took the diplomas of M.R.C.S., L.R.C.P., and the London degrees of M.B., B.S. At the Middlesex Hospital he was successively house-physician, house-surgeon, resident anaesthetist, and surgical registrar. He then entered the R.A.M.C. and served in France as a captain in the war of 1914-18. On returning to civilian life in 1919 he made the higher surgical qualifications his next objective, and in the following year he proceeded to the M.S. and became a Fellow of the Royal College of Surgeons of England. Mason decided to specialize in oto-rhino-laryngology, and he devoted the rest of his life to the subject. His first appointment in the specialty of his choice was as registrar at the Throat Hospital, Golden Square. Later he became ear, nose, and throat surgeon to several hospitals, including the Dreadnought Hospital, Greenwich, King George Hospital, Ilford, and the West Middlesex Hospital, appointments he carried out with great conscientiousness and care. He was popular with patients, nurses, and colleagues for his thoroughness, courtesy, friendliness, and encouragement, and was particularly active in forwarding the interests of his assistants. He was an adept at rose-growing, and his skill at this was well known. He liked travel abroad, and was knowledgeable about ecclesiastical architecture. He is survived by a widow, a daughter, who is a medical student at his old hospital, and a son.—H. D.

We are indebted to F. A. L. for the following appreciation: The withdrawal of a familiar figure from the wards and out-patient department of a hospital always leaves a gap, but when that figure was one universally regarded not only with respect but with affection the sense of sudden loss is acute. It was never long before acquaintance with Courtenay Mason, whether by professional colleague, nurse, patient, or administrator, developed into warm friendship.

It was clear that he had a particular affection for the Dreadnought Seamen's Hospital at Greenwich, where he worked for 30 years among seafarers of every race, creed, and nationality with great devotion and complete immunity from all idea of personal gain. Retiring, and even withdrawn, in manner, he spoke, if he spoke at all in medical council, at the end of a debate, when he contributed his considered judgment in a slow diction and with a dry humour which now evokes endearing memories.

The colleagues and close friends of Dr. JOHN STOKOE, medical officer of health of Scarborough, were totally unprepared for his sudden death on July 11 at the age of 51, for he had had no preliminary illness. He was born at Blyth, Northumberland, on January 25, 1902, the son of Mr. P. L. Stokoe, and was educated at Barnard Castle School and at the Newcastle College of Medicine, graduating M.B., B.S. from Durham University in 1924. He proceeded to the M.D. in 1938, having taken the degree of B.Hyg. and the D.P.H. two years earlier. After graduation he held hospital posts in Newcastle-upon-Tyne and then followed a few years in general practice in North-east England. In 1935 he entered the public health service with an appointment at the City Infectious Diseases Hospital, Newcastle-upon-Tyne. Two years later he was appointed assistant medical officer of health for Derby, and in January, 1939, became medical officer of health for his home town of Blyth. War broke out a few months later, but his services were retained at Blyth until, in 1943, he entered the R.A.M.C. as a general duties officer. Later he was appointed a hygiene specialist, and when released from the Army in 1946 he had attained the rank of lieutenant-colonel. He served in France, Belgium, Holland, and Germany, and there is no doubt that he found his Army experience both challenging and stimulating. Immediately after demobilization Dr. Stokoe obtained the appointment of medical officer of health for Scarborough. He assumed his new duties at a difficult time, for the "appointed day" was less than two years away, and with it he was to see the independent borough which had appointed him becoming for the most part included in a divisional area of the North Riding County Council of Yorkshire. When the change did come Dr. Stokoe was appointed medical officer to the Scarborough Rural District and the Scalby Urban District, and he tackled the work in his new area, with its wide variety of problems, with characteristic energy, deriving much satisfaction from the welding together of diverse units into an administrative whole. Although such duties took up a large part of his time, Dr. Stokoe never wholly lost his clinical interests, and the immunization clinics and the health of the older schoolboys remained in his care. Like many another medical officer of health, however, he deplored the loss of the fever hospital when it passed to the control of the regional hospital board. He was a strong advocate of clean food, and organized educational campaigns among food-handlers. A man of strong personality, he applied himself with great vigour to every task, however small, never sparing himself either at work or at play. For relaxation he played golf, and was an enthusiastic member of the South Cliff Golf Club. To his widow, formerly Miss Winifred Shy, also of Blyth, and his son our sympathy is extended.—E. R. C.

Dr. JOHN PRINGLE died at his home at Gosforth, Cumberland, on July 12 at the age of 83. He was born on December 13, 1869, and studied medicine at Trinity College, Dublin, where he graduated M.B., B.Ch. in 1894. He proceeded to the M.D. in 1896 and took the Cambridge D.P.H. in the following year. Immediately after graduating he came to England to assist the late Dr. Joseph Henry in practice at Rochdale, Lancashire. At the turn of the century he established himself in his own practice at Manchester, where, in the Whalley Range district, he soon gained the confidence and friendship of his patients. When he retired from practice in 1946 he settled at Gosforth, within easy reach of his beloved hills, and there he spent the remainder

of his life happily engaged in the numerous activities in which he was interested. As well as being a greatly loved physician he was an expert philatelist, having a very fine collection. He was particularly interested in the "balloon post," on which he was an expert, being the author of a book on the subject. In 1911 he married Dorothy Beney, of Beckenham, and she, with his four sons, survives him.—G. A. M.

After two years of ill-health, Dr. J. W. ELLIS died at his home at Kimbolton, Huntingdonshire, on July 20 at the age of 64. He had said that he preferred "wearing out" to "rusting out," and he fulfilled the principle behind his own words, for he remained at work until two months before his death. John Weaver Ellis was born on July 31, 1888, and as a child he went with his parents to New Zealand. On the death of his father he carried on the family farm until a younger brother was old enough to take it over. He then qualified as a pharmacist, and before the war of 1914-18 he had his own chemist's business in New Zealand. In 1914 he returned to England and obtained a commission as a member of the New Zealand Expeditionary Force. For conspicuous bravery in the fighting on the Somme in 1918 he was awarded the Military Cross. After the armistice he went back to New Zealand, where he married Miss Alice Timms. Three years later he became a medical student at Guy's Hospital, and qualified M.R.C.S., L.R.C.P. in 1928. In the following year he settled in practice in Kimbolton, where he stayed until death ended his work 24 years later. Dr. Ellis, whose early life made him peculiarly suited to country practice, was a man of abounding energy, with wide interests and an unfailing sympathy and tolerance. It is as a man and a friend that the people of the 32 villages covered by his practice will miss him, although they will feel keenly, too, the loss of a skilled general practitioner. In addition to the work of his practice, Dr. Ellis acted as medical officer to Gaynes Hall Borstal Institution, and he was a member of the committee of management of the local hospital and of the Huntingdon panel committee. In non-medical spheres his interests were centred on Kimbolton School, of which he was a governor from 1937 onwards, and in freemasonry, which was a constant source of pleasure and relaxation. He was a provincial grand senior warden for the Province of Northamptonshire and Huntingdonshire in 1951, a past master of Euston Lodge, St. Neots, and a founder member of the Old Kimboltonians Lodge. No man fulfilled the principles of freemasonry in his daily life better than he, since love and truth were the bases of his dealings with all, whether acquaintances, friends, or patients. He leaves a widow, a son, and five daughters.—A. F. G.

Dr. H. WALMESLEY GREENWOOD died on May 2 at Redcross, Co. Wicklow, aged 52. Henry Walmesley Greenwood was educated at Ampleforth College, York, and at the Middlesex Hospital Medical School, qualifying M.R.C.S., L.R.C.P. in 1925. As a medical student he had a distinguished career, being awarded the Lister Memorial Prize in physics, and several class prizes. After qualification he held a number of house appointments at the Middlesex Hospital, and later became senior resident medical officer at the City of London Maternity Hospital. In 1927 he entered general practice as a partner in an old-established firm of doctors at Southend-on-Sea, where he met with immediate success. With a temperament particularly suitable for general practice and the gift for making lifelong friendships, he soon gained the confidence of his colleagues. He was also chairman of the South Essex Division of the British Medical Association in 1946-7 and first chairman of the local medical committee. A forceful speaker in committee, he was never afraid to voice an opinion or to speak what he thought to be the truth. He was a Roman Catholic, and his religious faith meant much to him. During the last war he was left to manage a large practice single-handed, a responsibility which caused a breakdown in health from which he never fully recovered. Although he entered the

National Health Service at its inception, he did not take kindly to many of its aspects, particularly the form-filling, and two years ago he gave up his practice to turn to farming in Eire. That he had the esteem and affection of his former patients was clearly shown by the wish of many of them to send wreaths to his funeral in Ireland, and by the decision to erect a commemorative plaque on the grave of his little daughter in Sutton Road Cemetery, Southend-on-Sea. He leaves a widow and one son and one daughter.—J. B.

Medico-Legal

HEALTH SERVICE FRAUDS

Dr. John Joseph Flanigan, aged 28, was at Airdrie Sheriff Court on August 3 sentenced to sixty days' imprisonment for defrauding the Lanarkshire Executive Council. An appeal has been lodged.

Dr. Flanigan had originally been charged with three offences: (1) making false claims in respect of thirty-two patients and defrauding the executive council of £56; (2) defrauding the executive council of £5 8s. 6d. in respect of a claim regarding the confinement of a patient; and (3) uttering, as genuine, twenty maternity medical service claim forms on which signatures of patients were forged. When the case was called, Mr. John Wheatley, Q.C., said that his client was adhering to a plea of not guilty in respect of the second and third charges. He also stated that Dr. Flanigan admitted only twenty-five of the instances alleged in the first charge.

The Fiscal, Mr. A. L. Nixon, accepted that plea, and the second and third charges were dropped, charge one was reduced to twenty-five items, and the amount of money involved amended to £43 15s. Continuing, the Fiscal said that Dr. Flanigan had been in partnership in general practice with Dr. Bernard McLaughlin since 1948. "For some time relations between the partners were not happy, and eventually they became rather hostile. Solicitors for Dr. McLaughlin called on me and made certain complaints, which I felt bound to investigate. While so doing, the present charge came to light."

Mr. Nixon told the court that the Department of Health had intimated to executive councils in 1949 that where a second doctor was present at maternity cases to administer an anaesthetic an additional fee of 35s. was payable. On twenty-five occasions Dr. Flanigan had claimed for the services of a second doctor when, actually, none was present, and the charge had come to light because it was felt that these claims were excessive. It was true that in the terms of the partnership Dr. Flanigan paid the £43 15s. into the business and received a one-third share. But it was he who, by false representation, had induced the executive council to pay the full amount.

Mr. Wheatley said Dr. Flanigan's decision to plead guilty to part of the complaint reflected great credit on his courage and his humanity. He had deemed it unfair to expose his patients and other witnesses to the embarrassment, anxiety, and worry of the witness-box, and he felt it better that the dispute with his partner should be aired in the Civil Court rather than in the glare and limelight of the Criminal Court. Mr. Wheatley pleaded with Sheriff A. J. Stevenson to give Dr. Flanigan an absolute discharge. Dr. Flanigan had manifestly not been setting out purposely to defraud the N.H.S. of large sums. What really happened was that through carelessness on his part, for which the only excuse was overwork and personal anxiety, he made claims for which he was not entitled.

Sheriff Stevenson said that he had given full weight to the history of the charge and Dr. Flanigan's personal background, but such an offence was so much more serious than any other case involving a similar amount of money that he could do no other than send him to prison.

Universities and Colleges

UNIVERSITY OF LONDON

The following have been appointed or nominated for appointment or reappointment as representatives of the University on the governing bodies indicated in parentheses: Dr. G. Selby Wilson (Lister Institute of Preventive Medicine); Professor J. Willis (Royal Dental Hospital of London, School of Dental Surgery); Dr. C. E. Newman (West London Hospital Medical School); Mr. S. Gnessen (Mount Pleasant School).

C. B. Allsopp, D.Sc., Reader in Physics at Guy's Hospital Medical School, has been appointed to the Chair of Physics applied to Medicine tenable at that School from October 1.

The Special Advisory Board in Postgraduate Medical Studies has been constituted from October 1, and until further order, as follows: the Dean of the Faculty of Medicine; the Director of the British Postgraduate Medical Federation; the Dean of the London School of Hygiene and Tropical Medicine; three representatives of the Board of the Faculty of Medicine; the two members of the Senate appointed by the General Medical Schools; one representative of the Board of Advanced Medical Studies; two representatives of the Board of Pre-clinical Studies; one representative of the Board of Studies in Pathology; one representative of the Board of Studies in Hygiene and Public Health; one representative of the Board of Studies in Dentistry; and not more than six other persons to be appointed after report from the Special Advisory Board.

The Paul Philip Reitlinger Prize of the value of £30 is offered for the best essay embodying the result of some research work on a medical subject carried out by the candidate. Candidates must be students of the University who, on June 1 preceding the award, were studying in one of the Schools of the University in the Faculty of Medicine, or graduates of the University who, on the same date, were of not more than five years' standing from the date of taking their first degree, and who are, or were, students in such School. Essays must reach the Academic Registrar, Senate House, not later than October 1, 1954, and must be accompanied by a certificate from the candidate's teacher or other responsible person to the effect that the research work forming the subject of the essay is substantially the work of the candidate presenting the essay.

Dr. R. A. Shooter, Senior Lecturer in Bacteriology in St. Bartholomew's Hospital Medical College, has been appointed to the University Readership in Bacteriology tenable at that College.

UNIVERSITY OF SHEFFIELD

At a meeting of the Council held on June 19 Dr. A. J. N. Warrack was appointed Part-time Honorary Lecturer in Pathology.

The resignation of Dr. S. A. Doxiadis, Senior Lecturer in Child Health, was received.

At a Congregation on June 27 the following medical degrees were conferred:

M.D.—J. A. Griffiths (with distinction), D. Dexter, E. A. Johnson.

M.B., Ch.B.—W. K. C. Morgan (with second-class honours), J. O. Newman (with second-class honours), E. M. Bateson, Audrey M. F. Brook, Juliet S. Bryant, A. H. Clarke, Mary W. Dickson, E. R. J. Emery, Avril M. Frampton, P. N. Griffin, P. C. Griffith, G. Haigh, B. F. Hallatt, R. B. Heath, W. Heathcote, Dorothea V. M. Holmquist, W. P. G. Jones, J. Longstaff, C. M. MacCallum, Ann B. Marples, T. W. May, P. B. Moxon, Mary Neville, Eileen M. O'Neill, C. Protheroe, P. A. Ramsey, G. B. Schofield, W. E. Sharnan, N. W. Shepherd, R. E. Smith, C. F. I. Sparling, A. H. Stearns, Enid M. Stephenson, C. K. Sutcliffe, R. Tym, W. G. Waterlow, J. Wilson, B. Winchurch, J. A. Wright.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on July 9 Sir Cecil Wakeley was re-elected President for the ensuing year. Sir Reginald Watson-Jones was re-elected and Professor Lambert C. Rogers elected Vice-presidents.

Dr. E. Rohan Williams (St. Mary's) was co-opted to the Council for the year 1953-4, representing radiology.

It was reported that Dr. E. Ashworth Underwood, director of the Wellcome Historical Medical Museum, had been elected a Hunterian Trustee.

The following three deaths were reported with regret: Mr. Victor Bonney (Past Vice-President and Member of Council);

Mr. R. G. Hogarth (Past Member of Council); and Dr. Frank H. Lahey (Honorary Fellow).

Mr. R. S. Johnson-Gilbert was appointed assistant secretary of the College.

Professors and lecturers for the ensuing year were appointed as follows:

Hunterian Professors.—Mr. V. E. Negus, one lecture on the comparative (and human) anatomy of the nose and nasal sinuses; Mr. D. J. Browne, one lecture on the principle of controlled movement in orthopaedics; Professor R. Milnes Walker, one lecture on the place of venous shunts in the treatment of portal hypertension; Mr. F. W. Holdsworth, one lecture on traumatic paraplegia; Mr. H. S. Morton, one lecture on some potentialities of the electrogastragraph; Mr. J. B. Kinmonth, one lecture on the lymphangiography in clinical surgery and particularly in the treatment of lymphoedema; Mr. D. I. Williams, one lecture on the chronically dilated ureter; Mr. D. J. Robertson, one lecture on congenital arteriovenous fistulae of the extremities; Mr. A. B. Nutt, one lecture on the significance and surgical treatment of congenital ocular palsies; Mr. D. M. Morrissey, one lecture on the treatment of obliterative vascular disease; Mr. I. P. Todd, one lecture on the role of elective surgery in the management of diverticulitis of the colon; Mr. R. H. C. Robins, one lecture on primary reconstruction of the injured hand.

Arris and Gale Lecturers.—Mr. H. A. Haxton, one lecture on the sympathetic supply of the upper limb before and after sympathectomy; Mr. G. J. Hadfield, one lecture on the effect of hormones on healing; Professor D. Slome, one lecture.

Erasmus Wilson Demonstrators.—Dr. G. D. Lumb, one demonstration; Dr. J. S. Young, one demonstration; Dr. L. M. Franks, one demonstration; Mr. W. H. W. Jayne, one demonstration.

Arnott Demonstrators.—Professor M. F. Lucas Keene, two demonstrations; Professor G. W. Causey, one demonstration; Dr. F. Stansfield, one demonstration; Professor R. J. Last, one demonstration.

In addition Sir Stanford Cade was awarded a Hunterian Professorship, Dr. D. R. Haynes an Arnott Demonstratorship, and Dr. B. E. Heard an Erasmus Wilson Demonstratorship.

A Diploma of Fellowship was granted to M. Ali.

Diplomas were granted, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN ANAESTHETICS.—R. W. Baxter, D. Bigley, May S. Bisset, T. B. Boulton, J. Burgoyne, A. D. Clarke, N. F. Cockett, D. J. Coleman, M. P. Coplans, T. T. Currie, C. H. Devereux, Beatrice A. Earnshaw, Elizabeth F. Everitt, J. G. Fairer, B. L. Finer, H. P. Graham, J. M. Hansen, H. M. Hardy, A. G. Henderson, J. I. M. Lawson, J. Leibovitz, J. W. R. McIntyre, Maria R. Mackay, A. L. MacKenzie, J. Middleton Price, R. E. Molloy, D. K. Morgan, G. N. Mulliner, C. Nikitik, J. F. Nunn, B. S. Perera, W. J. Pryor, Nancy G. S. Roberts, Margaret Rooms, Judith M. Ross, J. D. St. Clair, W. E. B. Scott, K. N. Sen Gupta, Beatrice E. Sleigh, J. R. Spears, M. K. Sykes, Charlotte McE. Taggart, J. A. Thornton, P. H. Venen, Patricia Wilson, V. P. Wordsworth.

DIPLOMA IN LARYNGOLOGY AND OTOLGY.—S. Ahmad, P. A. O. Anyaegbunam, R. W. Bailie, D. P. Belgrave, M. Brookes, P. B. Foxwell, J. H. Grant, R. Hully, G. Immermann, L. P. B. Kiriella, G. W. Leitch, J. F. McAuliffe, A. G. McCallum, K. G. Malcomson, A. Marsland, I. H. Mazer, G. Murray, M. V. Naidu, M. J. J. Rao, H. N. St. John, D. L. Sugrue, S. Sytcha, Caroline M. van Dorp.

DIPLOMA IN MEDICAL RADIODIAGNOSIS.—A. Ansell, G. Ansell, J. St. C. Ballenden, A. Berezowski, M. E. Berk, A. S. Bligh, H. H. Bloch, D. Brink, N. L. Bucky, J. C. Chartres, C. J. Don, A. J. Eley, H. G. Feltham, Eleanor B. Fielding, A. Fotoohi, H. Freilich, J. Friedman, Sarah H. Getz, N. K. Ghose, L. Green, B. C. Hale, M. A. Harris, J. W. Hoe, P. F. Mathias, J. S. Matthews, J. L. Morris, D. McK. K. Muir, E. Price, L. J. Sandell, H. Smith, J. V. Tillet, B. F. Vaughan, L. E. Wolpert, I. Yentis.

DIPLOMA IN MEDICAL RADIOTHERAPY.—T. W. Backhouse, R. F. Burton, Muriel Coates, A. F. Crook, B. Dosoretz, A. M. Jelliffe, H. Lehrner, M. B. McEvedy, R. G. C. MacLaren, K. W. Mead, R. A. R. Taylor, R. P. Varma.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—H. Bourne, C. P. C. Gore, E. J. E. Jones, Josephine M. Lomax-Simpson, Frances E. Smart, A. Watt, L. Zollman.

DIPLOMA IN PATHOLOGY.—J. D. Heppleston, P. W. Kippax, H. B. Marsden.

DIPLOMA IN CHILD HEALTH.—Lynda C. Proctor.

DIPLOMA IN OPHTHALMOLOGY.—G. A. O'Reilly.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—L. K. Simango.

AUG. 15, 1953

UNIVERSITIES AND COLLEGES

Hospitals were recognized under paragraph 23 of the F.R.C.S. regulations as follows: Royal United Hospital, Bath, ear, nose, and throat registrar for six months. Cumberland Infirmary, Carlisle, redesignation, junior registrar has now been redesignated "senior house officer." Queen Mary's Hospital for Children, Carshalton, two orthopaedic and general surgical registrars, both for six months. Essex County Hospital, Colchester, decennial revision, two surgical registrars; from January, 1954, two casualty officers. Leicester General Infirmary, additional recognition, three senior house officers for twelve months. Connaught Hospital, London, reduction from twelve to six months in period of recognition of existing posts of resident surgical officer and house-surgeon; from January, 1954, casualty officer. East Ham Memorial Hospital, London, resident surgical officer for twelve months; house-surgeon for six months; from January, 1954, casualty officer. Preston Hospital, North Shields, and Victoria Jubilee Infirmary, Tynemouth, three house-surgeons for six months (provided that each post shall be resident for approximately four months at Tynemouth Infirmary and two months at the Preston Hospital). Crumpsall Hospital, Manchester, additional recognition, senior house officer (genito-urinary department) for six months; from January, 1954, senior house officer (orthopaedics) (hitherto recognized for general surgery). Rochford General Hospital, redesignation, house-surgeon, orthopaedics and fractures, has now become "house-surgeon, general and orthopaedic." R.A.F. General Hospital, Ely, from January, 1954, casualty officer. Stockport Infirmary, decennial revision, resident surgical officer (surgical registrar) for twelve months; assistant resident surgical officer for six months; three house-surgeons for six months; from January, 1954, casualty officer. Southend-on-Sea General Hospital, from January, 1954, casualty officer. North Staffordshire Royal Infirmary, Stoke-on-Trent, from January, 1954, casualty and assistant resident surgical officer (hitherto recognized for general surgery). Sutton and Cheam Hospital, from January, 1954, casualty officer. Victoria Jubilee Infirmary, Tynemouth, see under Preston Hospital, North Shields. Hillingdon Hospital, Uxbridge, additional recognition, house-surgeon (general and thoracic); house-surgeon (general and thoracic) both for six months; from January, 1954, one registrar (casualty); three junior hospital medical officers (casualty); reduction from twelve to six months in period of recognition of senior house-surgeon. Whitehaven and West Cumberland Hospital, surgical registrar for six months. Workington Infirmary, surgical registrar for six months. Rowley Town Orthopaedic Hospital, Woking, two senior house officers (dent) both for twelve months.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

name of R. S. Morton was mis-spelt as R. S. Norton in the of new Members of the College printed in the *Journal* of just 1 (p. 291).

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

a meeting of the Council of the College on May 16, with the sident, Mr. Arthur A. Gemmell, in the chair, the following e elected to the Council to fill statutory and other vacancies: representatives of the Fellows, A. M. Claye (Leeds), J. F. ningham (Dublin), V. J. F. Lack (London), D. McK. Hart (agow), J. A. Stallworthy (Oxford). As representatives of the mbers, A. L. Deacon (Birmingham), A. S. Duncan (Edin- gh).

he following were admitted to the Fellowship: H. H. uracre Barnes, J. W. D. Buttery, H. C. Callagher, A. B. Con- on, S. E. Craig, Gladys V. S. Cunningham, J. N. I. Emblin, W. Gall, D. S. Greig, U. P. Gupta, T. N. Hart, A. M. rtwell, W. Hawksworth, O. V. Jones, C. W. A. Kimbell, M. Lemmon, J. T. Louw, D. J. MacRae, Mary H. Mayeur, D. Meares, S. Misra, Coralie W. Rendle-Short, Kathleen M. binson, Dorothy M. Satur, L. J. te Groen, R. A. Tennent, W. L. Thompson, H. K. Waller, J. A. Waterman, B. H. atson, S. A. Way, J. L. Wright.

The following were admitted to the Membership: C. H. rman, D. M. Brodie, B. Bruce-Lockhart, K. G. Cockburn, B. Cooper, Janette G. Cowie, H. J. G. de Villiers, H. G. Dixon, Margaret M. Downes, E. M. Edwards, A. H. Foate, G. S. Foster, E. Fyfe, G. H. Garfield, J. M. Gate, L. Goldman, N. G. ourlay, M. Grant, R. W. Grayburn, D. Hay, G. C. S. Hunter, alentine M. Husband, Sarah I. Jacob, R. A. Kenihan, K. hadenga, H. H. Kirk, B. V. Kyle, J. C. McCawley, J. acpherson, J. S. McVeigh, Jean Murray-Jones, T. J. M. Myles, M. Norburn, E. M. O'Dwyer, S. Panchalingam, Evelyn Peters, M. McK. Pratt, M. J. M. Solomons, W. K. Sutton, T. A. ompson, R. S. Wurm.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending July 25 (No. 29) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	17	1	8	0	0	25	3	4	0	
Dysentery ..	309	38	88	1	2	140	16	40	0	2
Encephalitis, acute ..	9	1	0	0		3	1	0	0	
Enteric fever: Typhoid ..	2	0	1	3		2	0	1	0	1
Paratyphoid ..	11	1	0	0	1(B)	39	0	1(B)	0	
Food-poisoning ..	516	54		7		180	33		0	
Infective enteritis or diarrhoea under 2 years ..				15	56				5	27
Measles* ..	4,394	65	1	120	148	7,225	730	100	164	284
Meningococcal infection ..	20	3	12	0	2	25	1	13	2	1
Ophthalmia neonatorum ..	45	4	0	1		34	1	10	0	
Pneumonia† ..	239	26	133	2		259	16	94	1	1
Poliomyelitis, acute: Paralytic ..	151	19		8	11	104	4		3	2
Non-paralytic ..	115	17				59	2			
Puerperal fever‡ ..	259	41	5	0		213	37	13	0	
Scarlet fever ..	1,037	58	113	17	51	1,038	84	138	10	56
Tuberculosis: Respiratory ..			129	28				112	23	
Non-respiratory ..			18	3				36	7	
Whooping-cough ..	4,357	389	320	70	76	2,206	88	145	60	124

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0		0	0
Dysentery ..	0	0		0		0	0			
Encephalitis, acute ..	0			1		0				0
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	10	2	1	0	0	5		1	2	1
Influenza ..	3	0	0	0	0	4	0		0	0
Measles ..	0	0	0	0	0	0			1	0
Meningococcal infection ..	0	1				1	1			
Pneumonia ..	119	13	10	3	6	114	11		14	8
Poliomyelitis, acute ..	8	2			0	4	0			0
Scarlet fever ..	0	0	0	0	0	0			0	0
Tuberculosis: Respiratory ..	89	7	8	1	5	73	9	13	5	8
Non-respiratory ..		2	10	0	0		2	3	0	2
Whooping-cough ..	2	0	0	0	0	1	0		0	3
Deaths 0-1 year ..	223	31	24	2	14	199	23	19	7	17
Deaths (excluding stillbirths) ..	4,240	614	513	75	150	4,023	567	447	104	133
LIVE BIRTHS ..	7,675	1145	967	239	372	7,449	1114	814	210	443
STILLBIRTHS ..	186	29	19			179	32	23		

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

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

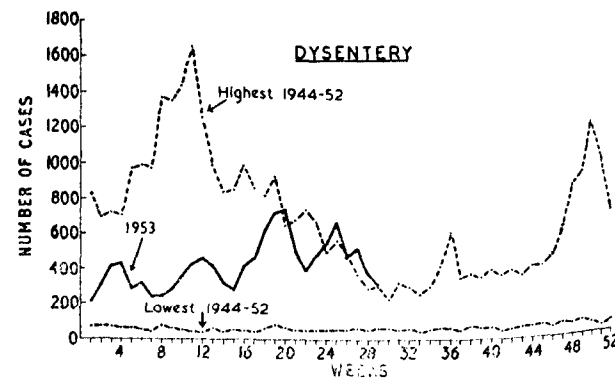
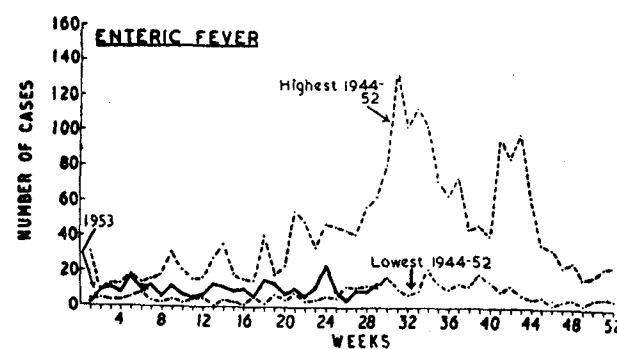
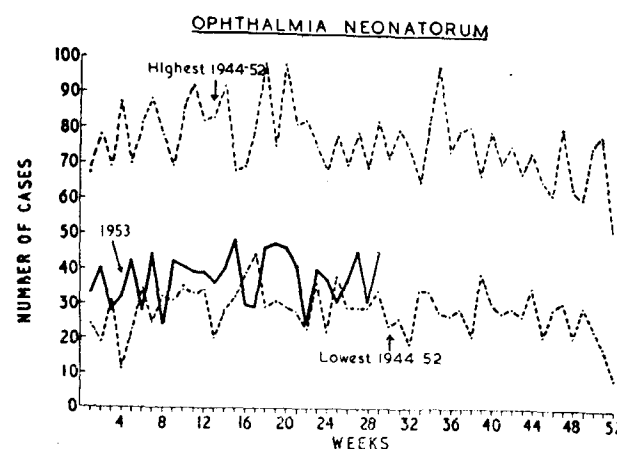
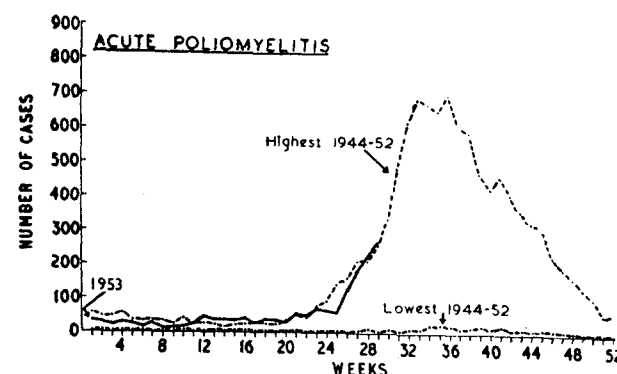
Vital Statistics

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in June was 120, compared with 130 (revised figure) in the previous month and 122 (revised figure) in June, 1952. The number of cases of industrial disease reported was 36, including lead-poisoning 1, epitheliomatous ulceration 13, and chrome ulceration 15. There were no deaths.—*Ministry of Labour Gazette*, July, 1953.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Only small fluctuations occurred in the incidence of infectious diseases during the week ending July 25 in England and Wales. The largest were a decrease of 401 in the number of notifications of measles, from 4,795 to 4,394, and an increase of 139 for whooping-cough, from 4,218 to 4,357.

The largest decrease in the number of notifications of measles was 99 in Yorkshire East Riding, from 307 to 208. Only small variations occurred in the local trends of whooping-cough; the only exception was an increase of 144 in Essex, from 288 to 432. 1,037 cases of scarlet fever were notified during the week, 19 more than in the preceding week, and no variations of any size occurred in the local returns. 17 cases of diphtheria were notified, one fewer than in the previous week. The largest return was 4 in Staffordshire, Coseley U.D.

266 cases of acute poliomyelitis were notified during the week. These were 4 more for paralytic and 39 more for non-paralytic cases than in the preceding week. The epidemic is still mainly confined to the southern section of the country. The largest returns were London 36 (Camberwell 4, Holborn 4, Lewisham 4; the remaining 24 cases were reported from 15 boroughs); Warwickshire 24 (Coventry C.B. 15, Birmingham C.B. 3, Atherstone R.D. 3), Essex 21 (Southend-on-Sea C.B. 8), Kent 15 (Maidstone M.B. 5), Lancashire 15 (Blackpool C.B. 5), Southampton 14 (Southampton C.B. 5), Surrey 14, Middlesex 14, Sussex 11, and Somersetshire 10 (Taunton M.B. 7).

A fall of 71, from 380 to 309, was recorded in the number of notifications of dysentery. The largest returns were Lancashire 52 (Manchester C.B. 10), London 38, Yorkshire West Riding 36 (Wakefield C.B. 11), Durham 28 (Lanchester R.D. 13), Middlesex 23, and Norfolk 20 (Norwich C.B. 12).

The largest outbreak of food-poisoning reported during the week was Durham, Consett U.D. 121.

Deaths in 1952

The quarterly return of the Registrar-General for England and Wales covering the first quarter of this year compares the numbers of deaths from certain causes in 1952 with those in the previous two years. Some of the figures are given in the Table below.

	1950	1951	1952
Respiratory tuberculosis	14,079	12,031	9,335
Meningeal	890	882	511
Other	1,000	893	739
Diphtheria	49	33	32
Cancer of stomach	14,445	14,661	14,410
" lung	12,241	13,247	14,218
Leukaemia	1,832	1,927	2,043
Coronary disease	54,755	58,309	61,429

Week Ending August 1

The notifications of infectious diseases in England and Wales during the week included scarlet fever 950, whooping-cough 4,107, diphtheria 11, measles 3,587, dysentery 334, paratyphoid fever 19, typhoid fever 4, food-poisoning 769.

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending August 1 (30th week of the year) were as follows: paralytic, 167 (151); non-paralytic, 103 (115); total, 270 (266). This is an increase of 4 compared with the previous week, the figures for which are in parentheses. The individual districts which have notified 15 or more cases in the year to August 1, with incidence per 100,000 in parentheses, are as follows: Southend-on-Sea C.B., 34 (22.44); Liverpool C.B., 21 (2.65); Hendon M.B., 15 (9.63); Birmingham C.B., 40 (3.57); Southampton C.B., 16 (9.12); Coventry C.B., 66 (25.29); Croydon C.B., 16 (6.38); Pewsey R.D.C., 16 (87.77); Manchester C.B., 15 (2.13); Leicester C.B., 19 (6.65); Lewisham M.B., 19 (8.37); Bristol C.B., 16 (3.60); Blackpool C.B., 18 (12.22); Camberwell M.B., 18 (9.93); Islington M.B., 16 (6.79); St. Pancras M.B., 17 (12.18); Bournemouth C.B., 22 (15.84).

The insignificant rise in total notifications from 266 to 270 is reassuring, even though there was an increase of 16 paralytic cases. The curve of incidence this year is now rather like that in 1952, although the seasonal rise started earlier and the figures are at a slightly higher level.

Medical News

Control of Isoniazid.—Under regulations which came into force on July 31 isoniazid and preparations containing it may be supplied to the public only on prescription by doctors, dentists, or veterinary surgeons.

Sports Physicians.—An invitation has been extended to members of the British Medical Association to take part in the international congress for sports physicians to be held at Obertraun, Hallstättersee, September 11 to 13. Details may be obtained from the secretariat: Liga für die Vereinten Nationen, Bösendorferstrasse 9, Vienna, 1.

Royal College of Surgeons in Ireland.—Mr. Michael P. Burke and Mr. Ian Fraser have been re-elected President and Vice-President of the College respectively.

COMING EVENTS

Symposium on Butazolidin.—The Empire Rheumatism Council is holding a symposium on butazolidin at the Royal Society of Medicine on November 13. Application for tickets should be made to the general secretary, Empire Rheumatism Council, Tavistock House (North), Tavistock Square, London, W.C.1.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Arnott.—On July 30, 1953, at Central Middlesex Hospital, Acton Lane, Park Royal, N.W., to Dr. Ruth Arnott (formerly Burt), wife of Dr. D. C. Arnott, a daughter.
Benn.—On July 28, 1953, at Musgrave Park Hospital, Taunton, to Patricia Mary (formerly Simpson), wife of J. Benn, M.D., M.R.C.P., a second son.
Edgington.—On July 31, 1953, at Queen Elizabeth Hospital, Birmingham, to Jean, wife of Dr. John Edgington, a son—Mark Jonathan.
Harrington.—On July 11, 1953, at Queen Victoria Nursing Home, Wolverhampton, to Geradine, wife of Dr. J. J. Harrington, of Dudley, a son—Sean Gerard.
Huggill.—On July 18, 1953, to Margaret (formerly Lawton), M.B., Ch.B., wife of J. A. W. Huggill, M.A., D.Phil., of 35, Warwick Road, Heaton Moor, Stockport, a son.
Matthews.—On August 2, 1953, at Lichfield, Staffordshire, to Joyce (formerly Wallis), wife of Dr. Bryan Matthews, a second son.
Stewart Hunter.—On July 18, 1953, at the General Hospital, Rochford, Essex, to Morfydd (formerly Ellis-Williams), wife of G. C. Stewart Hunter, M.R.C.O.G., a son—Christopher David.

MARRIAGES

Clark-Soutar.—On July 30, 1953, at King's College Chapel, Aberdeen, Charles Grant Clark, M.B., Ch.B., of Fraserburgh, Aberdeenshire, to Nita Millar Soutar, of Montrose, Forfarshire.

DEATHS

Blair.—On July 15, 1953, suddenly, at Ambercross, Links Gate, St. Annes-on-Sea, Robert Love Blair, M.B., Ch.B., aged 56.
Dolan.—On July 28, 1953, at Micklethwaite, Wigton, Cumberland, Edmund Michael Dolan, M.R.C.S., L.R.C.P., aged 73.
Lawson.—On July 27, 1953, Wilfrid Ernest Lawson, M.B., Ch.B., D.P.H., of Henry Square, Ashton-under-Lyne, Lancs, aged 78.

Any Questions?

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

Is Rest Beneficial in Primary Tuberculosis?

Q.—Is there any really good evidence that rest is beneficial in the treatment of primary tuberculosis—even if there are very large hilar nodes? Provided children are not fatigued, is it not better to treat them as out-patients rather than admit them to hospital, especially since they get no specific chemotherapy anyhow?

A.—Nowadays the criteria of "really good evidence" are changing. We know of no controlled trial of the effect of rest in primary tuberculosis, or indeed in any other form of the disease. But the necessity for rest in primary tuberculosis, especially if the child is in any way off colour, is widely accepted. In general, unless he is very ill, it is much better for the child's emotional (and perhaps ethical) development that he should be rested in the security of his home.

Finding Antibiotics

Q.—What are the present methods used for screening moulds or bacteria with antibiotic properties from those without?

A.—The methods used for selecting moulds and bacteria which produce antibiotic substances have changed very little from those originally used. A central colony of the organism to be screened is grown on a petri dish containing a suitable agar medium. Test organisms are then streaked radially from this central colony to the edge of the petri dish, and the plate is then incubated for a further period. The production of a diffusible antibiotic substance is demonstrated by zones of inhibition near the central colony.

When moulds are being screened, it is most important that the agar medium be suitably buffered to prevent the development of low pH; this would produce inhibition even in the absence of an antibiotic substance. If the organism being screened will not grow satisfactorily on a medium suitable for the test organisms, then it must be first grown on its own medium, the growth then being cut out and embedded in a medium suitable for the test organisms.

The number of test organisms used in such screening tests depends on what type of antibiotic is being sought, but it is not unusual for as many as forty to be employed. And, if the screening is to be really thorough, the organisms being screened are grown on a number of different media, as the medium employed often affects the antibiotic substances produced.

Carbon Dioxide Snow and Eczema

Q.—Is the treatment of stubborn patches of eczema with carbon dioxide snow still considered an appropriate form of treatment? It was quite commonly used a generation ago.

A.—The treatment of eczema with carbon dioxide snow is a method which tends to be forgotten from time to time, and revived or rediscovered periodically. There is no doubt that it is occasionally a very effective method, particularly in chronic lichenified areas, when either solid carbon dioxide snow or carbon dioxide slush may be used. It is somewhat out of favour at the present time because other methods are more convenient and perhaps give better results. At the same time, there are always cases of eczema which fail to respond to the more usual methods, and treatment with carbon dioxide is always worth bearing in mind in stubborn cases.

Word-blindness

Q.—The ordinary textbooks on ophthalmology give very little information on the diagnosis of word-blindness. Are there any standardized methods of investigation which might prove useful to the school ophthalmologist, and is there any textbook which gives information about the education of children suffering from word-blindness?

A.—Your correspondent evidently refers to the congenital or developmental form of word-blindness rather than the acquired form. Although a British ophthalmologist, Hinshelwood, published the first complete study of the condition in 1917, the disorder is neurological rather than ophthalmological. Most standard textbooks of neurology give a brief description of the condition, but the subject is more fully considered in S. T. Orton's *Reading, Writing, and Speech Problems in Children* (Chapman & Hall, London). In addition to "word-blindness," the disorder has also been termed alexia, dyslexia, asymbolia, and strephosymbolia. As the disability is rarely total, dyslexia is probably the simplest and most descriptive term. Word-blindness is an unsatisfactory designation, as the child is able to see perfectly letters and words, but continues inadequately to understand their meaning after he has reached an age when other children can read. In most cases the dyslexic child readily learns to recognize single letters and figures, but remains unable to appreciate the significance of words of two, three, or more letters and similar groups of figures. In other cases, simple written or printed words can be understood, but not longer words, and sentences. In all other respects the child may be quite normal.

Investigation is carried out only by patiently testing the child's ability to recognize first of all single letters and figures, then words of two letters, of three letters, and so on. As a preliminary measure, an assessment of the child's intelligence quotient should be made by an educational psychologist to exclude subnormal intelligence. Again, before considering a diagnosis of developmental dyslexia, one should make quite sure, by inquiring into previous methods of education, that the child's inability to read is not merely the result of faulty tuition.

No public facilities exist for treatment, as individual and almost daily tuition is essential if progress is to be made. A few speech therapists with special experience of the condition and some retired schoolmistresses have been known to accept cases for private treatment.

Deafness and Malnutrition

Q.—Having seen some recently repatriated prisoners of war, I would be grateful if you would answer the following questions. (1) What deficiency diseases involve the ear? (2) Could a perceptive deafness, with no other apparent involvement of the nervous system, be due to any nutritional deficiency?

A.—(1) Involvement of the ear with resulting deafness rarely results from deficiency disease. However, there are many scattered reports in the literature which indicate that deafness of perceptive type may occur in pellagra and other associated syndromes which probably result from deficiency of riboflavin and nicotinic acid. Deafness in chronic pellagra is not rare. Beriberi rarely causes nerve deafness.

(2) Experience among repatriated prisoners of war from the Far East in 1945 did, however, demonstrate conclusively that nerve deafness, sometimes of severe degree, occurred when there was gross evidence of malnutrition. It was also seen among German prisoners of war in the Middle East, and was then usually associated with retrobulbar neuritis and spinal ataxia. Occasionally nerve deafness occurred without involvement of the optic disk or spinal cord, but it was rare. These cases do not necessarily suffer from pellagra or beriberi, and the selective nature of the neuropathy constituted a striking feature. For further information on this subject see *Nutritional Diseases of the Nervous System*, by J. D. Spillane (Livingstone, 1946).

Severe Reactions after Vaccination*

Q.—What factors are known to predispose to particularly severe reactions to vaccination? Is x-ray treatment for lymphatic leukaemia likely to do so?

A.—Vaccination is presumed here to refer to vaccinia—or vaccination against smallpox. A living modified virus is used, and in the healthy susceptible individual a considerable local and some systemic reaction follows vaccination, particularly primary vaccination in adult life. The main complications—and they are ordinarily very rare—are generalized vaccinia and post-vaccinal encephalitis; the latter complication is more common after primary vaccination in older children and adults than in infancy or after re-vaccination. Any skin disease like eczema may predispose to secondary vaccinal infection on the affected sites causing one form of Kaposi's varicelliform eruption. Vaccination of a patient suffering from lymphatic leukaemia might carry a greater risk than normal of a generalized vaccinia because of the absence of the granular phagocytes; occasionally a greater risk than normal of a generalized vaccinia because of the lack of any antibody response. X-ray burns might also serve as foci for secondary vaccinal infection.

Does Vasectomy Rejuvenate?

Q.—Does bilateral vasectomy have a rejuvenating effect? Does it lead to the development of prostatic disease later on?

A.—Bilateral vasectomy has no rejuvenating effect, and no influence on the later development of prostatic disease; the testes do not as a rule show any histological change. Vasectomy does prevent epididymitis after prostatectomy in the vast majority of cases.

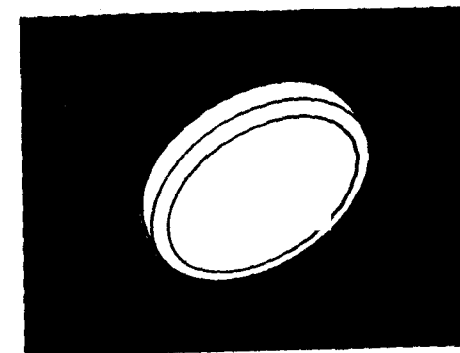
NOTES AND COMMENTS

Pneumonic Delirium.—Dr. M. ASTON KEY (Southsea) writes: "Your comment on the above subject ('Any Questions?' *Journal*, August 1, p. 296) reminds me that more than 50 years ago I was attending a robust man in middle life with a sharp attack of lobar pneumonia and a high temperature. One afternoon he got up, demanded his clothes, which his wife and her sister were too frightened to refuse him, and left the house with a lady on each arm, walked half a mile to a railway bridge, came home, undressed and got into bed again. They then sent for me and I found the womenfolk had not dared to do so earlier because of his determined attitude. He was none the worse for the escapade and some years later became the landlord of a large inn outside Portsmouth, where he lived for several years."

Correction.—There was an error in our report of the remarks made by Mr. C. Jennings Marshall at the meeting of the Section of Surgery during the Annual Meeting of the B.M.A. in Cardiff (July 25, p. 212). The last sentence should have read as follows: "He warned against the dangers of ligating the cystic duct too far distally and said that he himself was not averse to leaving a long stump."

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

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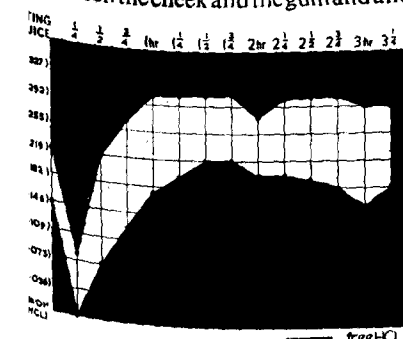
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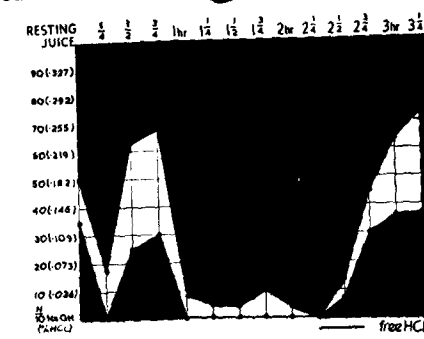
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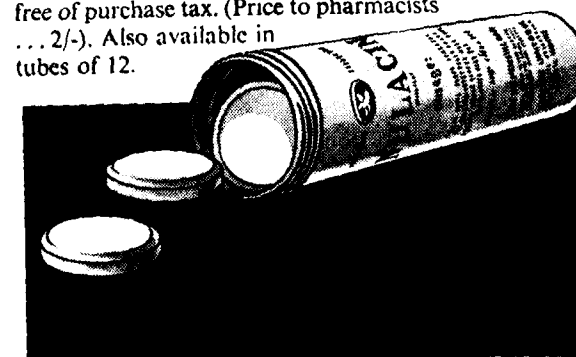
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REFERENCES:

British Medical Journal, 180-182,
26th July, 1952
Medical Press, 195-199,
27th February, 1953



HEALTH AND CLEANLINESS

Im-Hotep, the Egyptian god of healing, became known as Asklepios by the Greeks and as Aesculapius by the Romans. The symbol of the healing serpent and knotted staff may be seen at the Roman Baths, at Bath in Somerset. It was here that the warm sulphurous water was used by the Romans for its healing and cleansing effects. These waters are now known to be radio-active, and are still taken for their health-giving properties.

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BRITISH MEDICAL JOURNAL

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THE HUNTERIAN ERA: ITS INFLUENCE ON THE ART AND SCIENCE OF SURGERY*

BY

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In 1813 Dr. Matthew Baillie, a nephew of John Hunter, a distinguished physician and pioneer in the study of morbid anatomy, and Sir Everard Home (Hunter's brother-in-law), comparative anatomist and surgeon, executors, being desirous of showing a lasting mark of respect to the memory of the late John Hunter, inaugurated an oration to be called the Hunterian Oration, to be delivered in the theatre of the College on February 14, the birthday of John Hunter, or as near that date as possible, by the Master or one of the Governors for the time being, or a member of the Court of Assistants; such oration to be expressive of the merits in comparative anatomy, physiology, and surgery, not only of John Hunter but also of all such persons as should be from time to time deceased, whose labours have contributed to the improvement or extension of surgical science.

It will be agreed that the terms of reference, as enunciated by the founders of the Hunterian Oration, are wide, and the scope available to the orator considerable. Yet a study of John Hunter's writings and those of his contemporaries makes one realize the universality of this great man and his teaching—how much has been left unsaid and what inferences still remain to be drawn from his scientific researches. This is especially brought home to one after a study of various Hunterian Orations from the time of their inception in 1814, when the oration was delivered by Sir Everard Home, up to the present. The orator is thus enabled to glean inspiration from the researches of those who have previously held this post of honour. One is, however, left with a sense of frustration as to what unexplored fields of activity remain, and what further influence on the science and art of surgery can be brought to light, having its roots in the life and work of the great master, John Hunter.

John Hunter's Early Training and Character

It is a debatable point whether John Hunter was born on February 13 or 14, 1728. We in this College commemorate his birthday on the 14th.

Stephen Paget records that as a boy John Hunter was deficient in self-control—idle and ignorant; but he showed great neatness of hands and quickness of perception in anything mechanical, though he remained obstinately impenetrable to book-learning. The cultivation of the powers of observation was a great asset to Hunter. The seed was undoubtedly implanted in his mind during early childhood when he lived in the

family house of Long Calderwood, in Lanarkshire, with its farm and beautiful countryside. Instead of attending school he would play truant and spend time in the country imbibing the knowledge that Nature had to teach. To quote from an article on "Long Calderwood," written by Sir Arthur Porritt and published in the *Annals of the College*: "The interest of Long Calderwood to us of the Royal College of Surgeons of England lies in the fact that it provided the background for the first sixteen or seventeen years of John Hunter's life, and must have had a great formative effect on the future development of the genius of our patron saint." It is indeed good news to hear that, under the auspices of a Scottish Corporation, the property of Long Calderwood has been acquired for the purpose of its protection and maintenance as a "National Memorial."

Hunter the Man

As a man, John Hunter has been described as short, red-haired, pugnacious, but very kind; a natural philosopher seeking a clue to human ills by studying the comparative anatomy of animals, birds, and fishes. He was easily provoked and hated deceit. He was a craftsman of no mean order, having in his early days worked in a carpenter's shop under the direction of his sister's husband, Mr. Buchanan.

His work came first, much to the detriment of his wife and family, both socially and financially. Dr. Joseph Adams, in his *Life of John Hunter*, published in 1817, says: "John Hunter's countenance was open, and, though strongly impressed with thought, was by no means habitually severe, but softened into tenderness or sparkled with brilliancy, according to the impression on his mind."

Rudolf, in his address on "Hunteriana" delivered before the Hunterian Society in April, 1951, when referring to the character of John Hunter, said: "At home he was a model husband adored by his pupils and intimates, but to the outside world, a changed being, quarrelsome and disputatious."

His home in Leicester Square, where he spent his last days, was, it is supposed, the *mise en scène* for Robert Louis Stevenson's story *Dr. Jekyll and Mr. Hyde*. A suggestion of this dual personality is discernible in Hunter's character. Paget states that John Hunter was "emotional and impetuous—quickly moved to tears of sympathy, quickly ablaze with anger and fierce word."

One may compare the temporary anger of Hunter on occasions with his friend and pupil Edward Jenner,

*Shortened version of the Hunterian Oration delivered at the Royal College of Surgeons of England on February 13, 1953.

which was soon followed by a letter of apology and a reconciliation, or, again, "Hunter's violent anger just before he died at St. George's Hospital."

In spite of his temperamental nature, Hunter retained an abundant sense of humour, as instanced by some of the letters to his brother William. The following are abstracts of a few of these. One, written before 1780:

Dear brother,

The bearer is very desirous of having your opinion. I do not know his case. He has no money, and you don't want any, so that you are well met.

Ever yours,

John Hunter.

In a letter written to William dated September 28, 1761, when on active service, he says: "My fellow creatures of the hospital are a damn'd disagreeable set." In another, dated May 28, 1762, when on active service, he says: "I am obliged to be physician and everything else, and I think I do as well as the best of them." Another letter to Jenner dated January 29, 1789, in reply to one from Jenner asking Hunter to be a godfather to his child: "I wish you joy—it never rains but it pours. Sooner than the brat should not be a Christian, I will stand as godfather, for I should be unhappy if the poor little thing should go to the devil because I would not stand as godfather. I hope that Mrs. Jenner is well and that you begin to look grave now you are a father."



FIG. 1.—Sir Everard Home.

The Royal College of Surgeons is fortunate in possessing many of John Hunter's original letters. They are written in a clear and legible hand, so different from the handwriting of the majority of medical men of the present era.

In studying the character of John Hunter, one is struck with the comprehensiveness of the man. With him, medicine was the same as all science connected with life. One discovers an earnestness, and a grasp of understanding of natural objects which is phenomenal. He had no time for any study of men's devices. With all his roughness of manner, John Hunter carried an honest independence. He never truckled for advancement nor sought favours, but was at all times more ready to give than to receive.

He had to wait a long time before practice came to him, but in due course his income reached a figure of six thousand guineas a year. A goodly income, but one which in his case went to the advancement of science—to the development of medicine and to the foundation of the incomparable treasures which now are in the possession of the College.

It is recorded that when Hunter's portrait was placed before Lavater, the physiognomist, after deep study he exclaimed: "That man thinks for himself."

Cline, in a Hunterian Oration, says: "Much as Hunter *did*, he thought still more. He often told Mrs. Cline that his delight was to think."

Abernethy, in his Hunterian Oration of 1819, says that Hunter was "profoundly contemplative, his mind had not been taught to act in imitation of others; he disliked to read as much as he liked to think."

Travers wrote: "He was capable of large and comprehensive views of natural phenomena, and endowed with a microscopical faculty of seizing and analysing constituent parts and bearings."

We cannot be reminded too often that the really great men are not the great experimenters, nor the great observers, nor the great readers, nor the great scholars, but the great thinkers. Thought is the creator of all human affairs. Actions, facts, and external manifestations of every kind may triumph for a while, but it is the progress of ideas which ultimately determines the progress of the world.

The Influence of Mrs. Hunter on Her Husband's Work and Social Status

It is axiomatic that a wife may either make or mar her husband's career. Many of our most eminent medical men owe advancement in the science and art of their profession to a co-operative and understanding wife. In 1771 John Hunter married Anne Home, the daughter of an Army surgeon. She was 29 and he was 43 years old. She was a very accomplished and charming lady intellectually, and a great social asset. The marriage was not quite in accord with his bachelor brother William's views. For William, a wife who had no dowry was to his mind a pure mistake for a poor man, however great might be her beauty and her ability to lead and shine in society. But John Hunter had good taste. He was by nature an artist and loved pictures above everything; how then could he fail to desire that the choicest picture in his house should be the most lovely?

She was a good wife—devoted to her husband and fond of gay society, a taste which occasionally interfered with her husband's more philosophical pursuits. He was so wrapped up in his work that she must have had a lonely time, and must have been thrown much on her own resources. They lived first in Jermyn Street, in a house which his brother William had recently vacated. Later on they moved to a house at the north-east side of Leicester Square, where the Odeon Theatre now stands. Here Mrs. Hunter held her parties, which included many celebrities of the day.

Hogarth was a neighbour; Sir Joshua Reynolds lived in the precincts, as also Haydn during his first visit to London in 1782. Mrs. Hunter had many friends, among whom were Mrs. Thrale; Elizabeth Montagu, who was one of the original "blue-stockings"; and Fanny Burney, the novelist and authoress. Fanny Burney's first and best novel was *Evelina*, published in 1778. Samuel Johnson was her friend and admirer. It is said that Burke sat up all night to read *Evelina*, and that Reynolds would not touch his food until he had reached the end.

The management of the house in Jermyn Street must have often taxed the patience of Mrs. Hunter. Her husband invaded the rooms with his specimens, and the place became a veritable natural history museum. On one occasion Hunter was given a giraffe, and as he could find no room to contain it he cut off its legs and fixed it in the passage. Anne Hunter must have had an anxious time with a young family and husband who would not take care of himself—with patients coming and going, rooms filled with specimens and artists drawing them; also resident pupils. Holidays were spent in the country at Earl's Court. Hunter's "country" box, as he called it, at Earl's Court was a pleasant hour's drive from his home in Leicester Fields. The house stood in its own grounds with a meadow behind it.

Mrs. Hunter made the house beautiful, decorating it partly in the Egyptian style, then a prevailing fashion. The ceiling of the drawing-room was richly ornamented with strange birds, which her husband must have laughed at but never dared to classify. For Hunter the gardens were "zoological gardens" containing both wild and tame beasts: gardens in which he rambled at night studying the ways and manners of the varied forms of life in every detail. In spite of the temperamental nature of her husband, the marriage was a happy one, largely due to the patience and good temper of Anne. Dr. Joseph Adams, in his *Life of John Hunter* published in 1817, says: "Hunter had the highest of all human gratifications in the wife of his choice, suited to be his companion, and admirably fitted for, because always accustomed to the elevated rank which her husband had attained."

During his visit to London Haydn composed "The Six Canzonettas for the Voice," for which Mrs. Hunter wrote the libretto, and dedicated them to her. Among her verses is the charming song, "My Mother Bids me Bind my Hair," which lives for ever in the setting Haydn gave it. She also wrote the words of Haydn's *Creation*.



FIG. 2.—Mrs. Hunter.

In a letter to James Baillie, his brother-in-law, dated November 25, 1775, Hunter says: "As to myself, with respect to my family, I can only say that I am happy in a Wife, but my children are too young to form any judgment of them. I am not anxious about my children, but in their doing well in the world. I would rather make them feel one moral virtue than read Libraries of all the dead and living languages. You know I am no scholar, therefore do not feel the beauty of language."

John Hunter died in 1793, in poverty, having spent all his income in the development of his museum. His wife lived in penury until the museum was purchased by the Government in 1799, six years after his death. Mrs. Hunter was a widow for 29 years and died in 1821 at the age of 79. She kept her wit and beauty to the end of her days.

The Hunterian Orator of 1821 paid this compliment to her memory: "She had sustained an honourable widowhood, estimable for talents of her own and venerable as the relict of an illustrious husband."

The Hunterian Era

John Hunter lived and practised his art at a remarkable period in the history of England. He came to London in 1748. William Pitt was guiding the destinies of England. Burke came to London soon after Hunter, to study law, but subsequently turned his attention to politics and literature.

This was also the age of the Arts: Gainsborough, Reynolds, and the portrait painters; of Garrick and the stage. It was also an age which included Chippendale and the Adam brothers. It laid the foundations of modern science and modern medicine, in which John Hunter played a notable part.

The eighteenth century marked an era of religious and social reform, due in part to the influence of such men as John Wesley, William Wilberforce, renowned for his great

work in the abolition of slavery, and the philanthropist John Howard, especially famous for his labours to secure prison reform.

John Hunter must have been acquainted with all sections of the population of London, both fashionable and otherwise. The body-snatchers sold him bodies for dissection, and the poor thronged the newly founded hospitals. Consumption and fevers of all kinds were rife, especially gaol fever. The Hunterian era marked a period of much-needed improvement in London's sanitation.

At the beginning of the eighteenth century there were only four important hospitals in London: St. Bartholomew's, St. Thomas's, Bethlem, and the Chelsea Hospital for invalid soldiers. By the time Hunter arrived in London five more general hospitals had been founded: Westminster, Guy's, St. George's, the London, and the Middlesex—all within a few years of each other.

The eighteenth century was an age of indifference to infant life. Children often died abandoned in garrets and in the street. Those left to the care of the Poor Law and parish did not long survive the exigencies of treatment. Thanks to the prolonged agitation of a certain Captain Coram for an institution for the care of these unfortunate children, a Charter was obtained from George II. With the help of Handel, Hogarth, and others, Coram witnessed the fruition of his labours, and in 1745 the Foundling Hospital came into being.

The Influence of John Hunter's Associates and Friends

Sampson Handley in his Oration of 1939 showed how "Hunter's mind, in spite of a very superficial education, was developed by his association with great men of his period, such as his brother William, Cheselden, etc." But other factors were at work in addition to those especially related to the science of medicine. I refer to his contemporary associates in other fields, such as art, music, literature, and drama, all of which must have acted as a stimulus to general knowledge and mental alertness. Time will only permit reference to a few of those whose names are household words:

David Garrick, a famous actor and playwright—friend and pupil of Samuel Johnson. Garrick came to London with Dr. Johnson about 1737. He studied at Lincoln's Inn and also set up in the "wine trade" with his brother for a time, but soon gave up both these activities for the stage. It is worthy of note that in 1769 the Town Hall at Stratford-on-Avon was dedicated by Garrick to the memory of Shakespeare.

Samuel Johnson, author, who acquired a position in literary and artistic circles that has rewarded the efforts of no other man. He was the acknowledged dictator of the Literary Club, founded in 1763 by himself and Sir Joshua Reynolds, and numbering among its limited membership Burke, Boswell, Garrick, Gibbon, Fox, Sheridan, Goldsmith, and others. Boswell's *Life of Johnson*, long accepted as the greatest portrait ever written, was published in 1791.

Richard Brinsley Sheridan, dramatist and politician. He was considered a dunce by his mother at the age of 7. He had an indifferent record at Harrow and cared nothing for scholastic honours. In this respect the background is similar to that of John Hunter in his early days.

Handel, who numbered Pope, Fielding, and Hogarth among his closest friends. The year 1742 witnessed the production in Dublin of that great oratorio the *Messiah*.

All these men and many others were friends and acquaintances of John Hunter and must have had a salutary influence on his line of thought and intellectual make-up, and indirectly in the development of the science and art of surgery.

Hogarth was a neighbour of John Hunter when he resided in Leicester Square. From 1749 to 1764 Hogarth lived at Chiswick, and a mulberry tree grew in his garden. It was his custom to gather local children around him under the tree and feed them with his fruit. The house and tree were badly damaged by enemy action in 1940. The tree had recently fruited for the first time after a number of years. At the reopening of the former house of this great painter at the

beginning of 1952, a small pie, made from the fruit of Hogarth's mulberry tree, now 300 to 400 years old, was given to each guest.

Hunter as Writer and Lecturer

Hunter has been portrayed as "extremely industrious but a poor lecturer, and never had many pupils." As a lecturer, he stressed the advantages derived by a man of putting his thoughts in writing. He resembles, he said, "a tradesman taking stock, without which he never knows either what he possesses or in what he is deficient." A consciousness of the difficulty in making himself understood might have been among the motives for writing his lectures. Convinced of this difficulty in making others understand what appeared simple to himself, he encouraged conversations with his hearers after each lecture, in order to ascertain that his remarks had been clearly expressed. Hunter always professed his lectures to be on "Practical Surgery, with so much physiology as was necessary to render them perspicuous."

Hunter was not a prolific writer. His first appearance as the author of a comprehensive work was comparatively late in life, in 1771, when he was 43 years of age. In this year he published a "Treatise on the Teeth"—a treatise, it has been said, that was forced out of him in order to defray from its sale the expense of his impending marriage. He wrote a number of medical essays. His "Treatise on the Blood, Inflammation, and Gun-shot Wounds," a work dedicated to the King, was his last, and considered by some the greatest of all the Hunterian works.

In a study of Hunter's writings it is often difficult to grasp his line of thought completely. He observed so many things, held such breadth of view, and tried to compress so much into so little, that even had he possessed the necessary skill in exposition he would have been hard to follow. It is, I think, honest to say that, easily as he acquired knowledge from nature, he was according to ordinary ideas an illiterate man. He read from nature and took no time to read from any other source. The principal monument of Hunter's life was his Museum, so aptly described by Professor Wood Jones as "John Hunter's Unwritten Book." He sought truth fearlessly and the search cost him his life. He taught it as he saw it—earnestly, simply, and directly. His influence on medicine and natural science was far-reaching. Ottley, in his *Life of Hunter*, says: "In his writings we occasionally find an obscurity in the expression of his thought, a want of logical accuracy in his reasonings, and an incorrectness in his language, resulting from a deficient education." John Hunter was a poor lecturer and a man of few words. His power of imparting knowledge was chiefly by means of dissections and specimens, but also by sketches. He maintained a resident artist, who was kept busy making drawings of specimens. William Bell was the artist for fourteen years, and William Clift followed him and remained with Hunter to the end.

Hunter as Observer

As an original investigator, Hunter was one of the most laborious and comprehensive of his period. With regard to experimental work, it must be admitted that many of his experiments were rough, and some inconclusive ones led to incorrect inferences, as, for example, in his argument that the "veins do not absorb." But when he came to anatomy, to the broad outlines of natural history, or to the comprehensive grasp of vital phenomena, he had few equals.

As an instance of John Hunter's powers of observation I would mention the Hunterian specimen, in the Museum, of the "head of a chick at the close of incubation," showing the "shell-breaking knob on the top of the upper mandible." To be accurate, the specimen is that of a gosling. After fulfilling its function of breaking the shell of the egg the knob disappears.

A most interesting account of this "Hunterian Specimen and its Problem" was written by Sir Arthur Keith and published in the *Annals* of the College. He drew attention

to the fact that John Hunter was the first English observer to take notice of the horny knob of the chick. Nowhere does John Hunter himself claim this priority.

Hunter was in the habit of enunciating "general principles" and then making his facts fit into the framework. Coming to England he passed 40 years in the heart of the most empirical nation in Europe; a nation abhorring all general principles and proclaiming the superiority of facts and ideas. During his long residence in England he was acted on by two conflicting forces: The country of his birth made him "deductive"; the country of his adoption made him "inductive."

As a Scot, he preferred reasoning from general principles to particular facts; as an inhabitant of England, he became inured to the opposite plan of reasoning from particular facts to general principles. No doubt one of the reasons why Hunter in investigating a subject is often obscure is that on occasion his mind was divided between these two hostile methods. The conflict darkened his understanding.

Hunter as Surgeon

In *Buckle's History of Civilization*, 1878, it is recorded that Hunter introduced what is probably the most capital improvement in surgery ever effected by a single man—namely, the practice in aneurysm of tying the artery at a distance from the seat of disease—thus saving numerous lives. Before the time of Hunter the operation was performed by cutting into the sac of the aneurysm and tying the vessel above and below. So formidable was this proceeding in its consequences that amputation of the limb was frequently performed as a less dangerous and fatal measure.

As a surgeon, Hunter was a careful if not a brilliant operator; a surgeon who looked upon an operation as the opprobrium of surgery but who did his work well when called upon by necessity. His diagnosis was good for its day, and his observation of phenomena of disease acute. His practical skill was extolled by his former pupil, Astley Cooper. In Brock's recent masterly publication *The Life and Work of Astley Cooper* one realizes the similarity of outlook of master and pupil.

Hunter and the Hunterian tradition were the great inspirations of Astley Cooper's life and work. Hunter, like Astley Cooper, realized the importance of a proper relation between medicine and surgery. Before Hunter's time surgery was held to have but little connexion with medicine.

John Hunter's influence on the development of the science and art of surgery was in the main the natural sequence of his study of the basic sciences of anatomy and physiology, both in health and in disease. His meticulous researches in the realm of morbid anatomy constituted the foundation stone on which he established his *Surgical Principles*. Although the name of John Hunter may not be immortalized as that of a great surgeon, nevertheless he was a great exponent of the art of acquiring knowledge by observation, experiment, and research, without which any advance in surgical procedure is stultified.

Sir Henry Souttar, in his fascinating review of the recently published German book, *Masters of Surgery*, by Professor H. Killian and G. Krämer, lays stress on the brilliant description given of John Hunter as "one whose genius lay in observation and in the elimination of the immature and unscientific; who never wandered in speculation, and whose

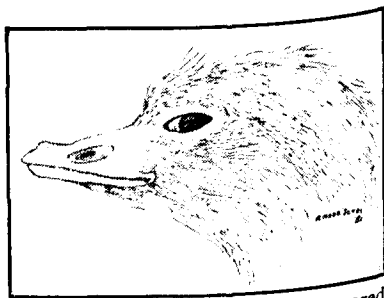


FIG. 3.—Drawing of a specimen prepared by Hunter to show the shell-breaking horny knob on the beak of a newly hatched gosling. By Professor F. Wood Jones. (Hunter's specimen 3456, No. 5, "Young Gosling.")

whole train of thought was built upon experience." If John Hunter was not a great surgeon he nevertheless was a talented exponent of those sciences which are essential to a sound knowledge of surgical principles and to the making of a surgeon.

Hunter as Pathologist and Museum Builder

Pathology was the science to which Hunter was most devoted. For him pathology was the basis of diagnosis and treatment. His experiments on the healing of wounds are well illustrated in the Hunterian Collection in the Museum of this College. He was a pioneer of the science and art of grafting and transplantation of tissues. His classical and successful experiment of grafting a cock's spur on to its comb is well known. This specimen is preserved in that Collection. He was also interested, and up to a point successful, in the transplantation of human teeth. He wished to study the comparative "growth powers" of different structures and of different situations, since he believed that this had a bearing on disease processes.

Professor Wood Jones, in an address delivered at St. George's Hospital with the title of "John Hunter's Unwritten Book," says: "The collection of specimens constituting the Hunterian Museum is one of the most remarkable monuments that any man has ever raised to perpetuate his memory. His Museum was the medium by which Hunter sought to express those great principles of life which he so profoundly understood, but which neither by speech nor by writing could he make clear to his contemporaries."

Wood Jones emphasizes the fact that John Hunter recognized that, in order to make satisfactory progress in the study of biology, function and structure must be integral parts of such study, and not divorced from each other. This was also in accord with the precepts enunciated and practised by Leonardo, who was designated by William Hunter as the first anatomist of his time.

The Museum

At the time of Hunter's death Clift was custodian of his Museum. The Government offered the executors £15,000 for the whole collection. This was voted by the

House in 1799 and was accepted. At this time the collection was still housed at Hunter's residence in Castle Street. The lease of this house came to an end in 1806, when the collection was placed in the custody of the Incorporation of Surgeons—soon to become the Royal College of Surgeons of London and later of England—and was moved to a house in Lincoln's Inn Fields belonging to the College.

It was largely due to the good offices of William Eden,



FIG. 4.—Samuel George Shattock.

later to become the first Baron Auckland, a distinguished politician and friend of the Hunters, that after many disappointments the purchase of the Hunterian Collection for the nation was successfully negotiated. He also obtained a government grant for Mrs. Hunter during the first two years of her widowhood. Clift was the first to be appointed Conservator of the Hunterian Collection. He was suc-

ceeded by his son-in-law, Richard Owen. Great advances were made under Owen's direction and subsequently. It remained for Sir Arthur Keith, anthropologist and comparative anatomist, to bring the augmented Hunterian Collection to its zenith as the most important of its kind in existence. Trustees were appointed to guard the Hunterian Collection. These have in succession carried on the good work and have co-operated with the Council of the College in the care of the specimens.

Amongst the events which have shaped the design and destiny of the Museum of the College, one of the most important was the engagement of James Paget, in the beginning of 1842, to prepare a catalogue of its pathological collection. An event of equal if not greater moment was the appointment of Samuel George Shattock to the office of Pathological Curator in 1897. The office was then comparatively new. In 1881, while Sir James Paget, assisted by Sir James Goodhart and Mr. Alban Doran, was preparing a second edition of the Pathological Catalogue, the Council decided to appoint a special officer to take charge of the pathological collection. The first occupant of the post was Sir Frederick Eve, then a young surgeon with a special knowledge of tumours. He was succeeded in 1890 by Mr. James Targett, a young gynaecological surgeon with a knowledge of pathological processes. To this office Mr. Shattock was appointed in 1897 as a successor to Targett. He was then 45 years of age, and in the plenitude of his powers.

Hunterian Pictures in the Museum Collection of the College

Certain pictures in the Museum of the College were part of the original Hunterian Collection and illustrate subjects in which Hunter was especially interested. William Bell and John André were accomplished artists, and most of the original drawings in the Hunterian Collection are by them. Several were painted for John Hunter by Zoffany, William Hodges, Stubbs, Robert Home (Hunter's brother-in-law), and William Cheselden. Amongst the collection is a drawing of William Hunter's dissecting-room by Rowlandson.

A number of the pictures have been reconditioned, thanks to the good offices of Geoffrey Keynes, who is "Curator of Portraits and Works of Art" of the College. The beneficial effect of such restorative processes is well shown in some of the famous paintings by Stubbs in the possession of the College, and which were exhibited in the Stubbs Collection at Liverpool in 1951.

The contemporary science of art in Hunter's time, of which he was no mean exponent, must have influenced his surgery and surgical technique. John Hunter showed his artistic temperament by making beautiful dissections.

Medical Societies

John Hunter was a source of inspiration in connexion with metropolitan medical societies. In 1783, together with Dr. George Fordyce, he founded the Society for the Improvement of Medical and Chirurgical Knowledge. The membership was originally nine, with provision for expansion to twelve. It soon became a dining-club, and was dissolved in 1818.

In 1785 the Lyceum Medicum Londinense was started under the patronage of John Hunter and George Fordyce. It met in Hunter's lecture-room in Castle Street, Leicester Square. There were 350 members. In 1809 its members were transferred to the Westminster Medical Society.

Fordyce wrote a *Treatise on the Digestion of Food*, and was remarkable for his practice of having one meal only in the day, at 4 p.m., but this was gargantuan, and went on for an hour and a half. It included a pound and a half of rump steak, a bonne-bouche such as half a boiled chicken or a plate of fish, a tankard of strong ale, a quarter of a pint of brandy, and a bottle of port. It is hardly surprising that he suffered from gout. Fond of society, he would dispense with sleep, and sometimes lectured for three consecutive hours without having undressed on the previous night.

In the latter part of the eighteenth century it was customary for medical consultants to visit coffee houses, such as the famous "Saracen's Head," in order to write prescriptions, at half a guinea or a guinea a time, for apothecaries who described the symptoms of their patients—a somewhat dubious and risky business, but a common and profitable practice among the more noted consultants of the faculty.

Activities of the College

Many of the activities of this College have their roots in the soil prepared by John Hunter and are products of the Hunterian era. First the Museum, the history and functions of which were so clearly enunciated by Professor Grey Turner in his Hunterian Oration of 1945, in which he showed the steps by which the Hunterian Collection grew into the Museum of the College. The name of George Grey Turner is held in esteem and affection by our College. Surely the mantle of Hunter fell on the shoulders of Grey Turner, who was a true disciple of that great man and a worthy exponent of the Hunterian tradition and all that it stands for.

With the growth and rehabilitation of our Museum after its war injuries, it is hoped that the underlying principles of Hunter's teaching will be fostered and the Hunterian tradition of experiment and research maintained.

This is an age of "ideology," but the practical application is not always easy to attain. The "Graphic Museum" in Khartoum is a modern concept of John Hunter's principles of imparting knowledge by a study of all aspects of disease—anatomical, physiological, and pathological. This is achieved by an orderly series of photographs, drawings, and specimens grouped together. It is possible, by spending an hour or so in a small division or alcove of the Graphic Museum, to obtain a shrewd insight into the aetiology, clinical manifestations, complications, morbid anatomy, and treatment of the particular disease in question. After a visit to that Museum one is struck with the possibilities, in any Museum, of such a comprehensive method of instruction.

Research

In 1931 Sir Buckston Browne, one of the greatest benefactors in the history of the College, presented the College with an "Institution of Surgical Biological Research" in a building adjoining the grounds of Downe House, Kent. In a letter to the Council of the College Sir Buckston said: "We all know that John Hunter had a farm at Earl's Court, where, from close observation of living animals, he was able to make his most important additions to surgical knowledge. It is such a farm that I wish the Royal College of Surgeons to accept." The farm is under the able directorship of Sir Arthur Keith, who has been Master of the Research Farm since its inception. The Hunterian tradition of experiment and research has thus been rendered a practical proposition, with notable advances in physiology, technique, and elaboration of surgical principles. It is of historical interest to recall that in 1928 Sir Buckston (then Mr. Buckston Browne) purchased Darwin's home at Downe, and conveyed the entire property to the British Association for the Advancement of Science, to be maintained for all time as a memorial to Darwin.

Hunter had wide vision as regards scientific problems. He could foresee a study of the basic sciences of anatomy, comparative anatomy, and physiology, and their practical application, taken in conjunction with that of morbid anatomy or pathology, culminating in a sound knowledge of the art and science of surgery.

This College has proved its adherence to the Hunterian precept of education in the basic sciences by the inauguration of an Institute of Basic Medical Sciences. By this means co-ordination with the University of London has been effected. Thus the Institute is at the same time both a Faculty of the College and an Institute of the British Postgraduate Medical Federation. The Institute of Basic

Medical Sciences is responsible for the teaching of anatomy, applied physiology, and pathology in the College under the able guidance of the Dean, Professor Geoffrey Hadfield. Arrangements are being made to form a department of pharmacology, which will also be administered by the Institute.

One of the more recent activities of the College is the institution of a Clinico-Pathological Research Unit in connexion with the Imperial Cancer Research Fund. The Fund, which is a worthy exponent of the Hunterian tradition of experiment and research, celebrated its jubilee last year.

In 1951 the Council of the College, in their wisdom, initiated a Clinico-Pathological Research Unit, with a view to correlating both the clinical and pathological aspects of research. The new department, established in the precincts of the College, is working in conjunction with experimental research carried out at the Fund's laboratories at Mill Hill. The institution of the Clinico-Pathological Unit is in accordance with Hunterian precepts, and marks a milestone in scientific procedure.

An Academy of Medicine

Sir Max Page, in his Hunterian Oration of 1951, envisaged the formation of an "Academy of Medicine." Previous Orators, notably Victor Bonney, have laid stress on the advantages which might accrue from the integration in one corporate body of the various specialties into which medicine of to-day is breaking up. Such an ideality is ever present in the minds of men of vision. There may be difficulties in bringing this Utopian project to fruition, but the formation of an Academy of Medicine or Mecca of Medical Science in London, by cohesion of the three Royal Colleges, together with their Associated Faculties, and under one roof, is an ideal worth striving for. To my mind such a scientific combination would be for the benefit of each and all concerned, as also of medicine in general. Some members of the profession may be sceptical and inquire, "How do you know that such a symbiosis of the Royal Colleges would advance the science and art of medicine?" I feel sure that if John Hunter were living at the present time he would have a ready answer to this query—namely, "Why not try the experiment?"

Hunter's Death and Commemoration Service

John Hunter at the time of his death was in his 65th year, the same age at which his brother William died. Such was the end of two brothers who, in their own Museums, erected their own monuments. Both arrived in London with no capital but genius, industry, and integrity. Each arrived nearly at the same age, finished his career in the same time, and each in the arena of his own labours: William struck with approaches of death in his own theatre, and in his expiring moments anxious to return that he might communicate a physiological fact he never could ascertain till then—namely, "How pleasant a thing it is to die"; John expiring on the spot. To set the time of John Hunter's death by the course of history Cliff wrote this title on his account-book:

John Hunter, Esq., F.R.S.,
Surgeon-General to the Army and
Inspector-General of Hospitals.
Surgeon to St. George's Hospital.
Surgeon-Extraordinary to the King.
etc. etc. etc.
Died October 16th 1793.

On the same day, and perhaps hour, the unfortunate Marie Antoinette, Queen of France, was beheaded in Paris.

John Hunter was buried in St. Martin-in-the-Fields Church. In 1859, when the coffins in the vaults of St. Martin's were moved for reinterment, Frank Buckland, a Member of this College, undertook the task of finding Hunter's body. He began on January 26, and searched for 16 days, by which time he had viewed 3,060 coffins; then he found it, when only three still remained for him to examine.

On March 28, 1859—that is 66 years after Hunter's death—his remains were reinterred in the north aisle of Westminster Abbey. A brass tablet in the stone floor of the nave of the Abbey, placed there by the Royal College of Surgeons of England, records the admiration of the College for:

"His genius as a gifted interpreter of the Divine Power and Wisdom at work in the laws of Organic Life, and their grateful veneration for his services to mankind as the Founder of Scientific Surgery."

The statue of John Hunter in the Museum of the College was erected by subscription on the occasion when John Hunter's remains were transferred to Westminster Abbey, in 1859. The statue is the work of Weeks, and is a copy in marble of the celebrated picture of John Hunter by Sir Joshua Reynolds in the Council Room of the College.

On February 14, 1952, Hunter's birthday, a service was held at St. Martin-in-the-Fields to commemorate the fact that John Hunter was buried in the church until 1859, when his remains were removed to Westminster Abbey. The service was conducted by the Dean of Westminster; the lesson read by the President of the Royal College of Surgeons, Sir Cecil Wakeley; and an address given by Sir Gordon Gordon-Taylor. A plaque was set up in the crypt, and was unveiled by Sir Henry Dale, a Hunterian Trustee. The plaque, besides recording the facts of Hunter's interment and reinterment, commemorates the name of Frank Buckland, the discoverer of the Hunter coffin. As Sir Gordon Gordon-Taylor remarked in his address: "It was owing to the zeal and enthusiasm of the late George Grey Turner that the project to place the plaque in the church had come to fruition."

On the front page of a brochure which deals with the restoration and development of the Royal College of Surgeons of England, the following lines appear: "All through the ages a golden truth is blazoned; the path of Progress is by Experiment, Research, and Trial." Surely here is the essence of the Hunterian tradition, of which the Royal College of Surgeons of England is the custodian.

TREATMENT OF PATIENTS WITH MYELOSCLEROSIS

BY

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Unless new bone formation in the marrow spaces has occurred (osteosclerosis), which can be detected by x-ray examination, the presence of fibrosis of the bone marrow can be proved in life only by biopsy of a bone in which red marrow is normally present. Needle puncture of the sternum and other bones is not a reliable method of detecting the presence of fibrosis. Bone-marrow cells are usually present among the fibrous tissue or in spaces lined by endothelium in the fibrous tissue, and the fibrosis may be patchy, and an active portion of bone marrow may be encountered. When the fibrosis is very dense, however, few bone-marrow cells may be present.

The object of this paper is to draw attention to the good results which may be obtained by x-ray treatment in certain cases, results comparable to those obtained in treating typical cases of chronic myeloid leukaemia (chronic leukaemic myelosis). Some recent writers, assuming that the enlargement of the spleen is a compensatory process to replace the fibrous bone marrow, have stated that x-ray treatment is harmful (Levinson and Limarzi, 1947; Paolino, 1949; Wyatt and Sommers, 1950).

Rarely patients with myelosclerosis may have the changes in the circulating blood of polycythaemia (Hirsch, 1935; Vaughan and Harrison, 1939; Sussman, 1947; Marson and Meynell, 1949, 1952) or of myeloid leukaemia (Heuck, 1879; Rosenthal and Erf, 1943; Sussman, 1947), but more commonly the changes are those of anaemia. Rarely the patient may die, within a few months from the first symptoms, of severe anaemia, with haemorrhages into the skin and from mucous membranes, presenting a clinical picture like that of acute or subacute leukaemia (Assmann, 1907; Mozer, 1927; Wood and Andrews, 1949). But most patients with myelosclerosis have splenomegaly, slight or no anaemia, with an increase in circulating leucocytes of varying degree and varying proportions of immature leucocytes and nucleated red cells. The enlargement of the spleen is due to myeloid metaplasia, usually involving granulocytes, nucleated red cells, and megakaryocytes. The megakaryocytes are often the most prominent cells in the myeloid metaplasia, partly because of their size and the ease with which they are recognized ("megakaryocytic myelosis").

When severe anaemia is present blood transfusion is the best treatment, and some patients have been kept alive for many years by repeated transfusions (Collins, Sanger, Allen, and Race, 1950). Some patients, however, do not respond to blood transfusions, and these may die of severe anaemia after a short illness. The anaemia does not respond to iron by mouth, or to liver extract by mouth or by injection. But most patients with myelosclerosis live a long time, and in these spontaneous remissions from anaemia may occur, and even polycythaemia may develop (Windholz and Foster, 1947; Hutt and Richardson, 1950).

The patients with myelosclerosis who have either no anaemia or only slight anaemia usually seek advice because of symptoms due to the large spleen. They may, however, have severe gastro-intestinal haemorrhages and large haemorrhages into the tissues, usually have cramps in the legs at night, and may have attacks of gout. Many of these patients ultimately die of severe anaemia, after a long period, but some never develop anaemia throughout and die of weakness and wasting or heart failure.

It is those patients with a high leucocytosis and a high proportion of immature cells in the circulating blood who respond well to x-ray treatment, regardless of the degree of myelosclerosis.

In many of these patients the main trouble is abdominal discomfort due to the large spleen; the general health of the patient may be unaffected, and he may be able to lead an active life consistent with his age. In such cases no treatment should be given except for encouragement to bear with the abdominal symptoms, some relief from which may be given by an abdominal supporting belt. Later on symptoms of general ill-health may occur, such as tiredness, weakness, and, later still, wasting. The first course of x-ray treatment produces the best result, and should be postponed until either severe abdominal symptoms or general symptoms of ill-health occur. This may produce a very good result, the abdominal symptoms diminishing or disappearing as the spleen decreases in size—weakness, tiredness, and cramps in the legs disappearing, and the patient being enabled to lead an active life again. This result is accompanied by a decrease in the numbers of the circulating leucocytes and of the immature leucocytes and nucleated red cells, and a decrease in numbers

of basophils and eosinophils if these were previously abnormally high. The improvement in the patient's condition lasts varying periods of time, as in typical cases of chronic myeloid leukaemia. Courses subsequent to the first usually produce diminishingly good effects.

Present Series

These observations are based upon four patients with osteosclerosis, and five patients with myelosclerosis without demonstrable x-ray changes in the skeleton, who have been under my care. One patient with osteosclerosis is still living. Of the eight who have died, full post-mortem examinations were made upon seven. In the other case, one of advanced osteosclerosis that was under observation from 1923 to 1938, only the spleen and liver were examined at necropsy.

Of these nine patients, seven had x-ray treatment, either to the spleen alone or to the spleen and long bones. One patient had severe anaemia when first seen; there was no increase in circulating leucocytes, though immature leucocytes, nucleated red cells, and megakaryocytes were present (the last up to 21% of the circulating leucocytes). Her response to blood transfusions was poor. Two injections of nitrogen mustard did no good, and she died four months after she was first seen. The remaining patient appeared as a case of acute leukaemia, with severe purpura, severe anaemia, slight leucopenia, immature leucocytes, and nucleated red cells in the circulating blood; he showed poor response to blood transfusions, and died two weeks after he was first seen and five months after the first symptoms of ill-health.

Of the seven patients who had x-ray treatment, two got no benefit. Neither of these had an increase in circulating leucocytes. One died of severe anaemia after five years' observation, during most of which time she had been able to work. Severe anaemia was present only during the last year. The other died of severe anaemia after 16 months' observation. Neither of these two patients responded well to blood transfusions; that is to say, this treatment improved the patient's health only slightly and temporarily.

But the remaining five patients got great benefit from x-ray treatment. They all had a large increase in circulating leucocytes, 20,000 to 70,000 per c.mm. before x-ray treatment. One, a patient with advanced osteosclerosis, was under observation from 1923 to 1938, and died of heart failure, never having severe anaemia throughout. He had a short course of x-ray treatment to the spleen in 1936, which decreased the discomfort due to the large spleen. Another patient, with early osteosclerosis, is still living. He has been under observation from early 1949 until the time of writing. A course of x-ray treatment to the large spleen in July, 1952, greatly improved his feeling of well-being, relieved the severe abdominal symptoms, and stopped the cramp in the legs.

The remaining three patients had more than one course of treatment. One, a patient with advanced osteosclerosis, x-ray pictures of whose bones have been published (Hickling, 1937), had x-ray treatment in 1938, 1939, and 1941. The first two courses produced very good effects upon her general health and upon the abdominal symptoms. The last course produced much less effect, and she died of severe anaemia in 1942, after five and a half years' observation. Severe anaemia was present only during the last year of her life, and did not respond well to blood transfusions. A series of x-ray pictures of this patient's bones was made, and the degree of osteosclerosis appeared to diminish after the first course of x-ray treatment.

Another patient, with myelosclerosis, without x-ray changes in the bones, had three courses of x-ray treatment, in 1948, 1949, and 1950. This man's chief trouble was repeated severe gastro-intestinal haemorrhages. He died after four years and four months' observation. The first two courses of x-ray treatment improved his feeling of

well-being and diminished the abdominal discomfort, but did not seem to diminish his tendency to gastro-intestinal haemorrhages.

The other patient had seven courses of x-ray treatment, to the first four of which his response was very good, though each course brought on an attack of gout, which started eight years before the first course of x-ray treatment. He died in 1945, of weakness, wasting, and chronic gout, after six and a half years' observation.

Discussion

A course of x-ray treatment should be planned so that just enough is given to relieve abdominal symptoms due to the large spleen. This also has the effect of relieving such general symptoms as tiredness, weakness, and cramps in the legs. If more than this is given, anaemia and leucopenia may occur. Two patients developed leucopenia as a result of too much x-ray treatment—one after the first and only course, and the other after the third course. In neither case did the leucopenia do any apparent harm. One patient developed anaemia after a course of x-ray treatment, which otherwise produced a good result, and slow recovery from the anaemia occurred.

Though many writers state that x-ray treatment of patients with myelosclerosis is harmful, some have reported good results (Reiche, 1927; Dameshek, 1945; Marson and Meynell, 1952; Nelson, 1952).

Most writers have taken the view that the myeloid metaplasia of the spleen and other organs is secondary to the fibrous or bony replacement of the bone marrow. Some believe that most cases of osteosclerosis or myelosclerosis are atypical forms of chronic granulocytic leukaemia (Custer, 1949). Others have suggested that myelosclerosis and osteosclerosis may be due to alterations in the undifferentiated cells of the bone marrow, of unknown origin, comparable to the alterations which cause increase in leucoblasts and erythroblasts (Vaughan and Harrison, 1939; Merskey, 1949; Moeschlin, 1951; Robson, 1952). The reduction in the degree of osteosclerosis of one of my patients under x-ray treatment supports this view, if it can be confirmed in other cases.

Splenectomy was not performed on any of the nine patients. Some authorities believe that occasionally this operation might do good (Bodley Scott, 1952; Richardson, 1952). References have been found to 14 patients with osteosclerosis or myelosclerosis who had splenectomy (Nauwerck and Moritz, 1905; Hirschfeld, 1914; Mettler and Rusk, 1937; Carpenter and Flory, 1941; Reich and Rumsey, 1942; Hittmair, 1944; Crail, 1946; Heller, Lewisohn, and Palin, 1947; Dustin, 1947; Crail, Alt, and Nadler, 1948; Wyatt and Sommers, 1950; Franks and Richardson, 1952). Of these 14 patients, four died within three months and four between ten months and six and a half years after splenectomy. Of the six recorded as having survived splenectomy, two survived a short time and four survived between one and five years. No striking improvement was produced in the condition of any of the patients, except one (Franks and Richardson, 1952). This patient was living several months after splenectomy and did not need the very frequent blood transfusions previously required.

Case Reports

Case 1.—A man aged 71. Presenting symptom, hardness of abdomen, and large spleen found February, 1949. No anaemia, no polycythaemia. Leucocytes 26,000 per c.mm., 10% immature cells. Cramps in legs since 1947. General health good for his age. X-ray pictures of skeleton show early osteosclerosis, mainly of humeri. Sternal marrow active, all elements involved, many whole and fragmented megakaryocytes. X-ray treatment to spleen, July and August, 1952; spleen reduced in size, cramps in legs disappeared. Slight anaemia resulted, which gradually disappeared. In good health for his age, February, 1953.

Case 2.—A woman aged 65 died in December, 1951, of weakness, wasting, and heart failure, after five years' obser-

vation. Presenting symptom, thrombosis of ventral vein of retina, December, 1946; enlarged spleen found. Slight anaemia, leucocytes 4,600 per c.mm., 19% immature cells. Spleen gradually increased in size, cramps in legs started in 1950, but she worked until April, 1951, when she became weak and ill. Sternal puncture failed to produce marrow cells. Trephine biopsy of sternum showed advanced myelosclerosis. No x-ray changes in bones. After April, 1951, blood transfusions, liver by mouth and by injection, cortisone and x-ray treatment to spleen were all ineffective. **Necropsy:** Intense myeloid metaplasia of spleen, Malpighian bodies little affected, many megakaryocytes; slight myeloid metaplasia of liver; intense myeloid metaplasia of some lymph nodes; intense fibrosis of marrow of sternum, humerus, femur, ribs, and vertebral bodies.

Case 3.—A man aged 51 died of weakness and wasting, July, 1950, after four years and four months' observation. Presenting symptom, severe intestinal haemorrhage, March, 1946, when a large spleen was first found. These haemorrhages occurred at intervals from 1942 to 1949. Spleen gradually increased in size until 1948, when it reached beyond the midline. No polycythaemia. No anaemia, except after haemorrhages. Leucocytes 15,000 to 24,000 per c.mm., immature cells 8 to 12%, megakaryocytes 1.5 to 2.2%. X-ray treatment December, 1948, caused shrinkage of spleen, decrease in total leucocytes, and percentage of immature cells. Second course in June and July, 1949, again produced improvement. Sternal marrow puncture produced a fluid poor in cells, in which megakaryocytic nuclei and other marrow cells can be seen. A third course of treatment in June, 1950, did no good. **Necropsy:** Intense fibrosis of marrow in sternum, humerus, and femur, but marrow cells recognizable among the fibrous tissue. Myeloid metaplasia of spleen, very few and small Malpighian bodies; very slight myeloid metaplasia of liver; four ulcers, recent in origin, in jejunum.

Case 4.—A man aged 49 died of weakness, wasting, and anaemia in June, 1945, after six and a half years' observation. Presenting symptom, abdominal discomfort, and large spleen found, January, 1939. Attacks of gout since 1931. Cramps in legs since 1938. Bone x-ray pictures normal. No anaemia. Leucocytes 38,400 per c.mm., immature cells 13%, nucleated red cells 3% of total nucleated cells in circulating blood. Sternal marrow active, May, 1943. X-ray treatment 1939, 1940, 1941, 1942. The first three courses produced very good results, the spleen shrinking, leucocytes diminishing, general health improving, and cramps in the legs disappearing. In 1943 weakness and wasting occurred, and anaemia, which did not respond well to blood transfusions. **Necropsy:** Fine fibrosis of marrow of sternum, ribs, and humerus, with spaces lined by endothelium packed with marrow cells, including large numbers of megakaryocytes. Myeloid metaplasia of spleen, with megakaryocytes; intense myeloid metaplasia of liver; few scattered areas of myeloid metaplasia in kidneys.

Case 5.—A woman aged 67 died of anaemia and heart failure in January, 1949, after five months' observation. Presenting symptoms, weakness and abdominal pains, September, 1948; anaemia and a large spleen found. Circulating leucocytes 8,000 per c.mm., of which 12% were immature cells; 5% of nucleated cells were erythroblasts, and 4% megakaryocytes. Bone x-ray pictures normal. Sternal marrow puncture produced a fluid poor in cells, among which megakaryocytic nuclei were prominent. Poor response to blood transfusions. Megakaryocytes in circulating blood later rose to 21%. Two injections of nitrogen mustard did not help. **Necropsy:** Dense fibrosis of marrow of humerus and sternum, no myeloid metaplasia of liver, intense myeloid metaplasia of spleen, megakaryocytes not conspicuous.

Case 6.—A man aged 71 died of weakness, wasting, and heart failure in March, 1938, after fifteen years' observation. Presenting symptom, abdominal pains, 1923, and large spleen found. No anaemia, no polycythaemia. Leucocytes 16,000 per c.mm.; 31% immature cells, and 4% erythroblasts. No bone x-ray pictures until 1936, when extensive advanced osteosclerosis was found. Cramps in legs 1936 onwards. No

treatment until 1936, when spleen extended nearly to the right anterior superior iliac spine. X-ray treatment caused some shrinkage of spleen. Leucocytes rose greatly at end, being between 40,000 and 90,000 per c.mm., from 1936 to 1938, with monocytes 12 to 25%. **Necropsy:** No other disease found, but only spleen and liver available for section. Intense myeloid metaplasia of spleen, mainly composed of one type of cell, Malpighian bodies absent; intense myeloid metaplasia of liver.

Case 7.—A woman aged 66 died of weakness, wasting, and anaemia in February, 1942, after six and a half years' observation. Presenting symptom, abdominal pains, 1935, and a mass felt in abdomen. At operation, performed on incorrect diagnosis, the mass was found to be a large spleen; a spleniculus was removed for histology. Leucocytes 30,000 per c.mm., 18% immature cells. Cramps in legs 1939–42. Bone x-ray pictures, 1936, showed advanced osteosclerosis. X-ray treatment to spleen and long bones 1938, 1939, 1941. The first course produced excellent results, spleen shrinking, general health improving, and serial x-ray pictures of bones showed diminution in intensity of osteosclerosis, especially after the first course. The second course also did good, the last was ineffective. **Necropsy:** Dense osteosclerosis of sternum, humerus, femur, ribs. Intense myeloid metaplasia of spleen, no visible Malpighian bodies. The spleniculus removed in 1935 showed myeloid metaplasia of pulp, with unaffected Malpighian bodies. Moderate myeloid metaplasia of liver. Intense myeloid metaplasia of lymph nodes from different areas and of lymph tissue in appendix.

Case 8.—A man aged 61 died of wasting, weakness, and anaemia, November, 1940, after one year and four months' observation. Presenting symptoms, tiredness, and irritability of legs, but rarely cramps. Moderate anaemia, total leucocytes normal, constant presence of immature cells and erythroblasts. Bone x-ray pictures normal. Iron and liver extract by mouth were no help. X-ray treatment produced very slight improvement in his health, spleen shrank considerably. Later, blood transfusions produced transient improvement only. **Necropsy:** Fine fibrosis of marrow of sternum and humerus, with endothelium-lined spaces packed with marrow cells; megakaryocytes plentiful. Myeloid metaplasia of spleen; Malpighian bodies not affected. Slight myeloid metaplasia of liver.

Case 9.—A man died of severe anaemia, June, 1952, after two weeks' observation. Presenting symptom, severe arthritis of hands, May, 1952. Moderate enlargement of spleen, purpura of legs and mucous membrane of mouth, severe anaemia, slight leucopenia, immature leucocytes 8%, nucleated red cells 36%. Serum uric acid 8.3 mg. per 100 ml. Sternal marrow puncture produced very few marrow cells. Poor response to large blood transfusion. **Necropsy:** Dense osteosclerosis of sternum and humerus, with practically no marrow cells visible; myeloid metaplasia of liver, spleen, and spleniculus; Malpighian bodies present but small; megakaryocytes not conspicuous.

Summary

A brief account is given of the chief clinical features of patients who have sclerosis of the bone marrow.

Those patients who have large numbers of leucocytes in the circulating blood, with immature cells among them, respond well to x-ray treatment, regardless of the degree of marrow sclerosis.

Serial x-ray photographs of the bones of one patient, before, during, and after x-ray treatment, were taken by Dr. W. H. Coldwell. Sir Alun Rowlands and Professor Clifford Wilson allowed me to see patients with myelosclerosis under their care. I am grateful to these gentlemen for their help.

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POLYCYTHAEMIA, LEUCO-ERYTHROBLASTOSIS, AND MYELOSCLEROSIS

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Reduction or obliteration of the bone marrow by connective-tissue proliferation or increased formation of bone occurs in the hereditary childhood condition of osteopetrosis, or marble bone disease of Albers-Schönberg, and also in a non-hereditary adult condition. This latter is probably best known as myelosclerosis, in which myelofibrosis or ossification of the marrow, sometimes called osteosclerosis, may be the predominant feature. The blood picture characteristically accompanying this condition shows leuco-erythroblastosis—defined by Vaughan (1936a) as “an anaemia characterized by the presence in the peripheral blood of unusually immature red cells and a few immature white cells of the myeloid series. The anaemia is not necessarily severe, nor is there usually a marked leucocytosis.” Previous polycythaemia in cases which eventually showed leuco-erythroblastosis and myelosclerosis has been described by Lehndorff and Zak (1907), Hirsch (1935), Vogel, Erf, and Rosenthal (1937), Stone and Woodman (1938), Rosenthal and Bassen (1938), Markoff (1939), Vaughan and Harrison (1939), Thompson and Illyne (1940), Jackson, Lemon, and Parker (1940), Rosenthal and Erf (1943), Stealy and Sumerlin (1944), Windholz and Foster (1947), Marson and Meynell (1949), Merskey (1949), Wyatt and Sommers (1950), and H. N. Robson (personal communication, 1952).

We are here reporting three further cases presenting as polycythaemia and terminating as leuco-erythroblastic anaemia and myelosclerosis.

Case 1

A 69-year-old woman, first seen in May, 1946, complained of pain in the lumbar region and in the hips and calves for one year and an aching mass in the left side of the abdomen for five months. Examination revealed a malar flush with slight cyanosis, a moderately enlarged heart, splenomegaly extending down to the symphysis pubis and across to the right side of the abdomen, and slight hepatomegaly. A blood count showed: red cells, 5,920,000 per c.mm.; Hb, 113%; white cells, 11,600 per c.mm. (premyelocytes 1%, myelocytes 8%, metamyelocytes 4%, neutrophils 68%, eosinophils 3%, basophils 2%, lymphocytes 11%, monocytes 3%); 2 nucleated red cells per 100 white cells; and some polychromasia. Achlorhydria was present, serum calcium was 9.6 mg. per 100 ml., and the Wassermann reaction was negative.

Nearly four years later, in February, 1950, readmission was necessary for pain and weakness of the left leg, frequency and urgency of micturition, and weakness, lassitude, and loss of weight. Ankle oedema with pigmentation and ecchymoses over both legs was present. All other physical signs were unchanged. Liver-function tests and radiographs of the long bones were normal. A blood count showed: red cells, 3,100,000; Hb, 66%; white cells 7,000 (myeloblasts 4.5%, premyelocytes 0.5%, myelocytes 6%, metamyelocytes 0.5%, neutrophils 56%, eosinophils 0.5%, basophils 5%, lymphocytes 16.5%, monocytes 8.5%, atypical monocytes 1.5%, mitotic figures 0.5%); 14 nucleated red cells per 100 white cells; and some macrocytosis. A biopsy of sternal marrow showed myelofibrosis; the haemopoietic tissue was almost entirely replaced by fibrous tissue; of the cellular elements megakaryocytes were present in increased numbers; polymorphonuclear cells with a small number of normoblasts could be seen scattered amongst the fibrous tissue; no haemosiderin could be detected by Perles's stain.

Case 2

A 48-year-old farmer's wife, when first seen in June, 1937, complained of morning hunger pains and three recent attacks of epigastric pain, backache, and vomiting. Examination showed a plethoric facies, slight sclerotic icterus, and splenomegaly extending 8 cm. below the costal margin. A blood count showed: red cells 8,500,000; Hb, 122%; white cells, 9,100 (neutrophils 92%, eosinophils 2.5%, basophils 1.5%, lymphocytes 2%, monocytes 2%); reticulocytes, 0.5–1%; some macrocytosis and moderate anisocytosis. Barium-meal examination showed only displacement of the stomach to the right. The presumptive diagnosis being polycythaemia vera, the spleen was irradiated, with considerable improvement.

Irradiation of the humeri and femora with reduction in the blood count—which had again risen to red cells, 7,500,000; Hb, 128%; white cells, 7,400—was carried out in February and March 1942. She remained fairly well for over three years, apart from several severe epistaxes in January, 1944, and on July 19, 1945. In January, 1946, treatment was necessary for the anaemia, then present—red cells, 3,200,000; Hb, 60%; white cells, 3,000; subsequently her condition remained stationary for over three years. Further treatment for the anaemia was necessary in August, 1949. The blood count showed red cells, 2,500,000; Hb, 48%; white cells, 4,200 (myelocytes 2%, metamyelocytes 6%, neutrophils 55%, eosinophils 4%, basophils 2%, lymphocytes 29%, monocytes 2%); 12 nucleated red cells per 100 white cells; and 3% reticulocytes. The spleen extended almost into the left iliac fossa and the liver to 9 cm. below the costal margin. Radiographs of the skull, pelvis, and long bones showed no abnormality. The red-cell fragility test showed commencing haemolysis in 0.5%

Sternal Marrow Counts

Cells	Case 1	Case 2	Case 3
Blasts	4.0	3.0	2.4
Premyelocytes	1.0	—	0.4
Myelocytes	22.0	15.0	10.0
Metamyelocytes	11.0	13.0	7.2
Neutrophils	41.0	34.0	39.6
Eosinophils	—	2.0	2.8
Basophils	—	—	2.4
Lymphocytes	1.0	21.0	23.6
Monocytes	4.0	—	3.2
Normoblasts	A	—	6.0
“	B	5.0	1.6
“	C	7.0	0.4
Mitoses	1.0	—	0.4
Megakaryocytes	—	—	—
Unclassified	3.0	—	—
Nucleated Cell Count per c.mm.	—	—	6,300
Leuco-Erythroid Ratio	—	—	1.6 : 1
Comment	—	A very poor cellular marrow.	Marrow easily obtained, bone not unduly resistant.

saline and completion in 0.35% solution. Sternal puncture revealed a very poor cellular marrow (see Table).

A biopsy was taken from the eighth rib. On section, the outer compact bone formed a thin layer no more than 2 mm. in thickness; the marrow cavity appeared greyish in the preserved specimen; transverse sections showed a notable fibrosis of the marrow spaces in the peripheral zones and a loose-constructed fibrosis, together with adipose tissue in the centre of the medullary cavity; there was no increase in the bony trabeculation of the rib, and, in fact, in many areas giant-cell osteoclasts was active; there was a marked reduction in haemopoietic tissue, which was mainly confined to one or two islets near the rib cortex; the predominant cells seemed to be eosinophil myelocytes; and there were also many eosinophil polymorphonuclears.

Subsequently she was admitted frequently in 1949, 1950, and 1951 for blood transfusion.

Case 3

A foreman engineer aged 51 was seen in March, 1944, complaining of occasional attacks of gout, recent slight loss of weight, and a left subcostal mass present for two years but only recently causing intermittent pain.

Examination showed only moderate enlargement of the spleen. A blood count showed: red cells, 5,600,000, Hb, 120%; white cells, 13,600 (myelocytes 9%, metamyelocytes 3%, neutrophils 45%, eosinophils 1%, lymphocytes 36%, monocytes 6%); 3 nucleated red cells per 100 white cells; and slight anisocytosis. Achlorhydria was present. Radiographs of the chest, lumbar spine, and pelvis revealed no bony abnormalities.

In September, 1945, the spleen extended into the left iliac fossa and the liver was slightly enlarged; few petechiae were scattered over the body. Irradiation of the spleen was carried out then, and in January, 1947, and in March, 1948, his general condition remaining fair. In March, 1949, he had severe perisplenic pain, general weakness, and acute gout. A blood count showed: red cells, 3,400,000; Hb, 64%; white cells, 9,200 (myelocytes 6%, metamyelocytes 15%, neutrophils 66%, lymphocytes 13%); 9 nucleated red cells per 100 white cells; reticulocytes, 3%; bleeding time, 3½ minutes; and clotting time, 5 minutes. The ribs showed an alteration in the bony texture radiologically, but no destructive process was visible. A sternal marrow biopsy showed myelofibrosis; the bony trabeculae were coarse and compactly arranged; the intervening marrow spaces were filled in some areas by adipose tissue, in others by vascular fibrous tissue; islets of haemopoietic cells were few, small, and widely scattered, and in most places were represented by the presence of a few megakaryocytes.

On his last admission, on September 27, 1949, five and a half years after his first appearance, examination showed

anaemia, gross splenomegaly, moderate hepatomegaly, ascites, basal pulmonary oedema, and gross oedema of the ankles. Death occurred on October 12, 1949.

Necropsy Findings

The lungs showed oedema with congestion of the lower lobes. The heart was dilated, with a pale greasy myocardium. The spleen weighed 2,330 g. Its capsule showed several large and small white opaque patches. On slicing, no Malpighian corpuscles could be seen. The surface showed a pale brick-red appearance with several irregular haemorrhagic zones of varying size. The liver weighed 4,020 g. Its capsule also showed opaque white patches. On slicing, the surface was paler and the consistency firmer than normal. There was an irregular fine whitish mottling, in parts simulating the nutmeg effect. Both kidneys on section were paler than normal. The gastric mucosa showed haemorrhagic patches. Some haemorrhages were also visible in the bladder.

Histology

Rib.—A section of rib showed pronounced osteosclerosis. Thick bony trabeculae were present. In some parts the trabeculae were very wide and the marrow space very small. The marrow was fatty towards the centre of the bone, but showed prominent fibrous areas with spindle-shaped cells, apparently fibroblasts, and groups of red- and white-cell precursors. The precursors were scanty and patchily distributed. Giant cells of the megakaryocytic type were prominent in some of the fibrous areas.

Vertebral Body.—The most striking changes were the presence of loose fibrous marrow and the sparseness of red- and white-cell precursors. Occasional multinucleated giant cells were visible. In some areas the bony trabeculae were wider than normal, but osteosclerosis was less pronounced than in the rib.

Spleen.—The normal splenic architecture was destroyed. Some increase in fibrosis was present. Malpighian bodies were absent. Numerous precursors of the red and white cells were present. Large cells with convoluted nuclei, some polychromatic and vesicular and others hyperchromic, were prominent in some parts, as many as eleven being in one high-power field. Numerous cells with indented nuclei and an eosinophilic slightly granular cytoplasm were also present.

Liver.—This showed scattered foci of leucopoiesis and erythropoiesis, situated mainly around the central vein. Amongst the cells of the granular and erythrocyte series there were large multinucleated cells similar to those found in the bone marrow and spleen.

Kidney.—Small foci of erythropoiesis and leucopoiesis were present.

Discussion

These cases presented the characteristic symptomatology, splenomegaly, and other physical signs and haematological features of polycythaemia vera, and resembled others described in that the polycythaemic blood-count figures were not very high.

The development of anaemia in the later stages of polycythaemia has often been noted. Minot and Buckman (1923) described a “secondary” anaemia, but the report of immature red and white cells in the blood suggests that this may have been leuco-erythroblastic anaemia. Several other authors have described the development of a typical leuco-erythroblastic anaemia. It is possible that the leuco-erythroblastic state has often been missed, for McMichael and Mc-Nee (1936) considered that repeated examination of the blood might be required to detect primitive red and white cells owing to the variations and fluctuations in the haematological features. In Case 2, unlike the others, immature red and white cells were not observed until the anaemic phase. As in the other cases mentioned above, myelosclerosis was found during the period of leuco-erythroblastosis. Recently, however, Hutt (1950) and Marson and Meynell (1952) in two cases discovered fibrosis of the sternal

marrow during actual polycythaemia. Cases of myelosclerosis with leuco-erythroblastic anaemia, but without previously recorded polycythaemia, have been reported by several authors, including Stephens and Bredeck (1933) and Rosenthal and Erf (1943).

A common feature of these cases, both with and without previous polycythaemia, has been the presence of myeloid metaplasia in the spleen. Numerous authors have commented on this—for example, Chapman (1933) found extramedullary hyperplasia of myeloid tissue described in 11 out of 14 reported cases. Askanazy (1904) apparently was among the first to indicate that reticulo-endothelial cells could become blood-forming cells in adults, while Hirschfeld (1905) recognized the importance of this myeloid metaplasia as a unifying feature of the cases. In the metaplasia Carpenter and Flory (1941) pointed out that, "in addition to leucoblastic cells, erythroblasts are constantly prominent and giant cells (megakaryocytes) are numerous." Most accounts, with the notable exception of that of Heller, Lewisohn, and Palin (1947), are in agreement with the view that all haemopoietic tissues are involved.

Vaughan (1936b) summarized 17 cases of myelosclerosis: in only one of the 14 cases in which necropsy or biopsy was performed was no myeloid metaplasia found in the spleen. Stephens and Bredeck (1933) collected 24 cases from the literature—19 of which were complete enough to be tabulated—and found that these latter showed splenomegaly, myelosclerosis, and myelaemia, and all but one showed normoblastaemia.

Despite the frequency of the occurrence together of myelosclerosis, leuco-erythroblastosis, myeloid metaplasia in the spleen, and megakaryocytic prominence in the spleen and marrow, which perusal of the literature reveals, the establishment of the syndrome comprising them has been rendered difficult by different authors emphasizing in their titles various characteristic features in these essentially similar cases.

The Syndrome

The morphological, haematological, and clinical features of this polymorphic leukaemia-like syndrome have been discussed by Heller *et al.* (1947). The condition, they say, is characterized clinically by a slowly progressive splenomegaly occurring in persons of either sex, usually within or beyond the fifth decade of life. There may be little impairment in the general health for many years, following which generalized weakness, anorexia, weight loss, ill-defined aches and pains, and discomfort occasioned by the greatly enlarged spleen frequently occur. The liver may enlarge. As a rule there is no significant involvement of the lymph nodes. The blood picture, according to Carpenter and Flory (1941), displays widely varying conditions from a rare initial polycythaemia to varying grades of anaemia, usually normochromic, but occasionally hypochromic; nucleated red cells have been prominent in all but a few cases. Immature red cells have not been seen in the peripheral blood in some cases—for example, Tudhope (1937) and Heller *et al.* (1947). Macrocytosis has occurred in the cases of Carpenter and Flory (1941), Heller *et al.* (1947), Robson (personal communication, 1952), and our Cases 1 and 2. Lindeboom (1938) thought that polychromasia, poikilocytosis, and anisocytosis were more pronounced in these cases than would be expected for the degree of anaemia.

The total white-cell count, according to Thompson and Illyne (1940), is rarely very high and is almost always well below the levels seen in untreated leukaemia. Myelocytes in the peripheral blood are rarely numerous. Occasionally, immature white cells have been absent from the blood as in the cases of Hewer (1937), Tudhope (1937), and Heller *et al.* (1947). Bleeding has occurred in several cases both with and without reported decreases in platelets (Hickling, 1937; Thompson and Illyne, 1940; Carpenter and Flory, 1941; and Heller *et al.*, 1947). Abnormal platelets, megakaryocytic fragments, and megakaryoblasts were observed by Hickling (1937), Carpenter and Flory (1941), Rosenthal and Erf (1943), and Heller *et al.* (1947). Other inconstant

features such as increased fragility of the red cells, slight reticulocytosis, positive indirect van den Bergh reaction, and high blood uric acid levels have been occasionally reported.

In several cases the liver as well as the spleen has been the seat of a myeloid change—for example, McMichael and McNee (1936), Hickling (1937), and Stone and Woodman (1938). This has been found commonly in the dilated sinusoids, but also in the periportal areas or peripherally between adjacent lobules. Less frequently the lymph nodes have been involved as well, as reported by Stone and Woodman (1938), Vaughan and Harrison (1939), and Rosenthal and Erf (1943). Fibrosis of the spleen has also been described by Stone and Woodman (1938) and Jackson *et al.* (1940). Our Case 3 showed some fibrosis in the myeloid metaplasia of the spleen; the liver showed the metaplastic reaction mainly around the central vein.

The bone marrow has not been reported as myelosclerotic in all cases showing leuco-erythroblastic anaemia, splenomegaly, myeloid metaplasia, and symptoms of long duration. How far this may have been due to incomplete examination of the bones cannot now be decided. In nine cases of this syndrome called by them "agnogenic myeloid metaplasia" Jackson *et al.* (1940) described the bone marrow as myelosclerotic in six and hyperplastic, aplastic, and normal in the others. Similar variation is found in the literature, but most frequently the marrow is hypoplastic. Sometimes "hyperplastic foci of haematopoiesis" have been scattered through the fibrotic elements; in a few cases hyperplastic myeloid tissue and fibrosis have been recognized together.

In regard to the sequence of events in the marrow, Wyatt and Sommers (1950), analysing 30 cases, regarded the fundamental lesion as necrosis of partly matured erythroid and myeloid cells with hyperplasia of surviving, usually more immature, cells and marrow reticulum cells. Subsequently, foci of atrophy appear. Eventually "the marrow is relatively acellular, made up of scattered reticulum cells, between which is a pink fibrillar or granular matrix and with numerous dilated empty vessels surrounded by small groups of bizarre megakaryocytes or nondescript haematopoietic cells." The end stage in certain cases involves a distinct type of new bone formation with "focal granular deposits of calcium in the eosinophilic matrix" and later deposition of bone in a layer about part or all of the old trabecular surfaces. The bony radiographic appearances of myelosclerosis have been described by Sussman (1947) as initially widening and increased density of the trabeculae followed by deposition of bone in an irregular fashion throughout the marrow cavity without thickening of the cortices or periosteal reaction.

Nature and Pathogenesis

Most authors, with the notable exception of Heller *et al.* (1947), believe this syndrome to be a separate entity and not merely a variant of leukaemia. Carpenter and Flory (1941) listed the principal features which have been held to differentiate this syndrome from leukaemic myelosis (myelogenous leukaemia) as (1) the diversity of cell types in metaplastic zones in organs and in the bone marrow; (2) the commonly low white-cell count with the low proportion of circulating primitive cells; (3) the almost constant presence of nucleated red cells; (4) the frequency with which osteosclerosis and myelofibrosis are encountered; and (5) the absence of characteristic leukaemic infiltrations. Further differentiation from leukaemia has been made by Erf and Herbut (1944), who pointed out that "extramedullary haematopoiesis is a focus of normal bone marrow situated elsewhere than within bone and attempting to produce normal circulating red and white cells," whereas "leukaemic infiltration is a focus of infiltrating immature white blood cells which because of their inherent reproducing capacities produce more immature white cells." They have also drawn attention to the large numbers of giant cells in the metaplastic myeloid tissue in the organs. In view of its asso-

ciation at times with tuberculosis of the spleen (Swirski-shewskaja, 1926), generalized infections (Brannan, 1927), and malignant metastatic deposits in the bone marrow (Hickling, 1937), it would appear that extramedullary haematopoiesis cannot be regarded simply as compensatory to the marrow sclerosis. Indeed, as Heller *et al.* (1947) have pointed out, more severe and persistent anaemias of other types do not occasion the massive extramedullary haematopoiesis found in myelosclerosis.

The myelosclerosis has been thought to result from an unknown toxin (Donhauser, 1908), the irritative effect of hyperplastic myeloid tissue (Hewer, 1937), or atrophy of the marrow (Wolf, 1932); it has been found in association with haemolytic anaemia (Wyatt and Sommers, 1950), metastatic carcinomatous deposits (Thompson and Illyne, 1940; Erf and Herbut, 1944), and tuberculosis (Hewer, 1937; Stone and Woodman, 1938). Windholz and Foster (1947) suggested the importance of Rh factor serological studies.

We agree with Vaughan and Harrison (1939) that the sclerosis of the marrow follows the same stimulus as produces extramedullary haematopoiesis. In other words the myelosclerosis is a dynamic process resulting from a definite stimulus rather than a sequel to atrophy of haematopoietic elements. The stimulus might be a deficiency in some nutritional factor, either direct or conditioned by other disease, or an abnormal metabolite. As pointed out by Vaughan and Harrison (1939) all the cell types involved in the hyperplasia are derived from a common source—the primitive reticulum-cell of Maximow. A common stimulus might therefore affect in degrees, varying from patient to patient, the osteoblasts, fibroblasts, the several series of haematopoietic cells, and megakaryocytes.

From this basic pathological process with diverse morphological possibilities a complex clinical and haematological syndrome results, not every case of which, as might be expected, will show all the various features recognized as characteristic. In this respect, Robson's case (personal communication, 1952) is of interest. Initially a sternal trephine was obtained showing marked osteosclerosis and megakaryocytosis with fibrosis, the blood picture being leuco-erythroblastic anaemia, and the spleen and liver showing myeloid metaplasia. Subsequently the blood count reached polycythaemic levels. Finally, at necropsy, three years after the onset, the marrow was seen to have reverted to a hyperplastic state with megakaryocytes still numerous, and some fibrosis still remaining but with little sign of the previous osteosclerosis, while the spleen and liver still showed metaplasia. In another case subsequent polycythaemia was described by McMichael and McNee (1936) 17 months after splenectomy had been undertaken for splenomegaly, myeloid metaplasia, and leuco-erythroblastic anaemia.

An indication of this diagnosis may be obtained during the investigation of obscure anaemia by the finding of difficulty in obtaining marrow from a sternal puncture and the absence of the characteristic "give" which occurs normally when the needle has penetrated to the marrow cavity. Most important, however, is the performance of marrow biopsy in cases showing features suggestive of the syndrome, or where sternal puncture fails.

Summary

Three cases of polycythaemia in two women aged 69 and 48 and a man aged 51, are described. Leuco-erythroblastic anaemia and myelosclerosis subsequently developed after 4, 12, and 5 years respectively.

Previous reports of leuco-erythroblastosis with myeloid metaplasia and myelosclerosis following polycythaemia vera are reviewed.

The syndrome, comprising leuco-erythroblastosis, myeloid metaplasia, and myelosclerosis, as revealed in the literature, has a varied clinical picture. It is thought to be distinct from myeloid leukaemia.

Vaughan and Harrison's view of the concomitant development from a common source—the primitive reticulum-cell of Maximow—of extramedullary haematopoieses and of myelosclerosis following some, as yet unknown, stimulus offers a reasonable explanation of the events.

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New regulations enable penicillin and aureomycin (the latter in a restricted form) to be used in the food of pigs and poultry, subject to certain safeguards. Both these preparations are controlled under the Penicillin Act, 1947, so that their retail distribution is otherwise limited to supplies given by, or under the direction of, doctors, dentists, and veterinary surgeons, or dispensed on their authority by pharmacists. The regulations have been made after consultation with the Medical Research Council and Agricultural Research Council, and come into operation on September 1. The antibiotics may be used either in the form of a supplement to be added to existing food or ready mixed with the food by the manufacturers of pig and poultry food. Safeguards to health are provided for in that (a) only minute quantities are needed and a maximum concentration is specified for both the supplement and the feeding-stuffs, and (b) the appropriate Health Minister must approve the composition of the diluent of the supplement. It will not be practicable to extract the antibiotic for use as medicine. These arrangements will not affect medical supplies. There is plenty of penicillin, and aureomycin will be used in the form of the residue from the process of extraction or in any other approved dilute preparation. The regulations also require certain information relating to the supplement and the antibiotic included to be given on the labels of the containers in such manner as the appropriate Agriculture Minister may require; they also empower him to require additional information to be given about the storage and use of supplement. The regulations apply to England and Wales, Scotland, and Northern Ireland, and are entitled the Therapeutic Substances (Supply of Antibiotics for Agricultural Purposes) Regulations, 1953.

SOME COMPLICATIONS OF TEMPORAL ARTERITIS

BY

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The first clear description of the condition known as temporal arteritis appeared in the article on intracranial aneurysm by Schmidt (1930); he did not, however, recognize the condition present. The disease was first fully described by Horton, Magath, and Brown (1932). Since that time many cases have been recorded, and it has become clear that the term temporal arteritis is an inadequate one, for the disease consists of a widespread arteritis affecting predominantly the branches of the external and internal carotid vessels (Bénard, Rambert, and Pestel, 1949), but in addition there has been evidence of arteritis elsewhere (Cooke, Cloake, Govan, and Colbeck, 1946; Cardell and Hanley, 1951).

Nothing is known of the fundamental aetiology of the disease; that it is allied to polyarteritis nodosa seems likely, but the changes in the affected vessels are not identical: the condition runs a more benign course and tends to affect very much older subjects than the latter condition.

The general course of the illness follows a fairly constant pattern. The subjects are usually elderly—average age 65 (Harrison, 1948)—and men and women are affected in approximately equal numbers. The onset is often insidious, with increasing malaise, mild fever, and pain in the head of variable intensity. When this pain is severe the slightest contact with the scalp at the site of pain may be unbearable, brushing or combing the hair may be very painful, and there may be pain on moving the jaw (Hoyt, Perera, and Kauvar, 1941; Bénard *et al.*, 1949).

In an uncomplicated case the pain and tenderness gradually subside, usually over a period of many weeks, and the general constitutional disturbance likewise resolves. In a high proportion of cases, however, other manifestations appear, and it is often these complications that cause the patient first to seek medical advice. Ocular complications are common. Wagener (1946) found visual disturbance in 18 of 37 patients; Bruce (1950) reported ocular involvement in 34 of 84 patients. Unilateral or bilateral blindness is common and is usually of sudden onset. Isolated sector defects may appear in the field of vision of one eye; there may be ocular palsy. Vertigo has been reported (Cooke *et al.*, 1946), there may be affection of the skin along the course of the temporal vessels, and small multiple ulcerative lesions of the nasal and buccal mucous membranes have been observed by Schweitzer and de Yong (1949).

Laboratory tests give variable results: there is a fairly constant rise in the erythrocyte sedimentation rate, there may be a slight polymorphonuclear leucocytosis, and an eosinophilia has been found by Hoyt *et al.* (1941).

Biopsy of a section of thrombosed temporal artery confirms the diagnosis. The affected vessel shows marked intimal thickening; infiltration of the media with lymphocytes, plasma cells, and at times giant cells; fragmentation of the elastic lamina of the media; and a thrombus in the lumen of the vessel in a varying state of organization and recanalization.

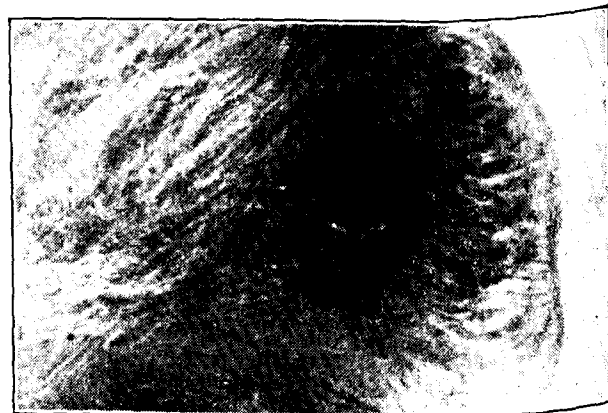
A description is here given of nine patients who suffered from temporal arteritis. It is of interest that all were country dwellers—an observation also made by Horton *et al.* (1932) and by Cohen and Harrison (1948).

Case 1

A woman aged 78, while recovering from a severe exacerbation of arthritis of the hips, wrists, and fingers in January, 1951, had intense temporal headache associated with intermittent fever to 102° F. (38.9° C.), a constant tachycardia of 100–120, anorexia, and loss of weight. The intensity of the pain increased, and the mere contact of any part of the head with the pillow became unbearable. Brushing the hair was impossible. She was at times mildly confused and delirious. Four weeks after the onset she awoke to find that vision was misty in each eye and within 48 hours all sight was lost. Examination at this time showed a considerable degree of emaciation. The whole scalp was acutely tender, and in all areas of the scalp thrombosed vessels could be felt. Both facial arteries were tender and non-pulsatile. Vision was lost in each eye; the pupils were of medium size and inactive to light. The optic disks were pale and the retinal arteries narrow and very tortuous. The peripheral vessels were sclerotic and the blood pressure was 150/70. There was widespread osteoarthritis, affecting the hands in particular.

One month later the pain and constitutional symptoms were subsiding. She had, however, developed an extensive area of necrosis of the scalp in the right parietal region near the vertex (see illustration). There was necrosis of the nasal septum, with a large perforation of the cartilage and offensive discharge.

The scalp healed very slowly over a period of four months, and the nasal discharge ceased. Nine months from the onset the patient was well although quite blind.



Photograph of Case 1 showing area of necrosis of scalp.

Comment.—The extent of the involvement of the scalp vessels seems to have been of a quite unusual severity—sufficient for a time to deprive one area of the scalp of an adequate blood supply.

Case 2

A woman aged 72 complained in July, 1948, of severe right-sided headaches and tenderness of the temporal region. Her past health had been good apart from severe arthritis of the spine and fingers. The onset of symptoms was gradual, with mild fever to 100° F. (37.8° C.) at times, and a tachycardia of about 120. When seen by me seven weeks from the onset she was pale, ill, and wasted. There was moderate tenderness of the right side of the scalp, the temporal vessels being hard, tender, tortuous, and non-pulsatile. The blood pressure was 220/120.

Salicylates gave some relief of pain, and the tenderness subsided in about one month. Three months later, while doing housework, she suddenly found that sight had failed

in the left eye. When seen one week later the left optic disk was pale, there was no perception of light, and the pupil did not react to direct illumination. The eye has since remained blind.

Comment.—The long interval between the onset of symptoms and the occurrence of blindness is by no means unusual. The part played by temporal arteritis may not at first be apparent if the symptoms have been slight.

Case 3

A man aged 66 was seen in August, 1949, complaining of intense left- and right-sided head pain of two weeks' duration, and giddiness and nausea of two days' duration. The onset of the latter symptoms had been sudden on rising in the morning. The giddiness was almost constant, with a feeling of being pulled to the left side, and was associated with a ringing tinnitus in the left ear.

Examination showed extensive thrombosis of the temporal vessels, mainly on the left side, with great tenderness. There was a coarse nystagmus to the left, and a moderate degree of nerve deafness on that side. The whole of the left side of the face did not move as well as the right. A blood count showed 26% of eosinophils in a total of 11,000 white corpuscles. The E.S.R. was 60 mm. in the first hour. A segment of the left temporal artery was removed under local analgesia with considerable resultant relief of pain. Section of the vessel showed typical changes of temporal arteritis.

The vertigo lasted about two weeks, at the end of which time there was considerable improvement. When he was seen six months later there was a mild degree of nerve deafness on the left side. There were no other symptoms.

Case 4

A man aged 78 was first seen in May, 1950, complaining of bitemporal pain and pain in the neck for two weeks, and loss of vision in the right eye for one week and in the left eye for two days. The onset had been gradual, with soreness in the temporal and occipital regions. After one week he noticed a dark patch in front of the right eye, and on waking next morning the eye was completely blind. Five days later he awoke to find the left eye blind. There had been no constitutional disturbance.

On examination the temporal and occipital vessels were tender and tortuous, but pulsatile. There was no perception of light in either eye, and the pupils were inactive. The right optic disk was pale. The blood pressure was 170/100. No other symptoms or signs developed, and he was well but blind five months later.

Case 5

A woman aged 69 started to complain in February, 1952, of severe pain on the right side of the head, pain on moving the jaw, and a recurrence of arthritis of the fingers, hips, and knees. Her symptoms gradually increased, and after four weeks she complained of double vision; this was followed by complete closure of the right eyelid.

On examination there was extensive bilateral thrombosis of the temporal vessels, the skin overlying the vessels was red and shiny, and the vessels were extremely tender. Tenderness was present over both temporo-mandibular joints. The temperature was 101° F. (38.3° C.) and pulse 110. There was much sweating. On the right side was a complete paralysis of the third cranial nerve. A blood count was normal, but the E.S.R. was raised to 40 mm. in the first hour.

Salicylates relieved the pain a little, and this subsided during the next six weeks. When seen in May, 1952, there was a partial right third-nerve paralysis, with dilated fixed pupil, incomplete ptosis, and defective adduction of the globe.

Case 6

A man aged 82 complained in March, 1952, of headache and soreness of the scalp which interfered with his sleep

owing to the pressure of the pillow. There was, however, no major constitutional upset and he continued to lead an active life. Six weeks later, while weeding his garden, he noticed that the left eye was blurred, and very shortly afterwards the right eye was likewise affected. Within 24 hours all vision had been lost. When seen one week later there was bilateral optic atrophy with no perception of light. The pupils were large and inactive. The temporal vessels on both sides were thrombosed and tortuous, but were not tender. The blood pressure was 190/100. A blood film was normal. Two months later the patient was well but blind.

Case 7

A woman aged 73 was seen in May, 1952. Three months earlier she started to complain of "fibrositis" all over her head. After a week or two she noticed numerous tender "knobs" in the temporal regions and at the back of her head. The pain and tenderness persisted for about six weeks. Three weeks before attending hospital she noticed an appearance as if a spider's web were before the left eye; one week later, on waking, she could only see downwards and to the left with the left eye.

Examination showed numerous nodular thromboses in the temporal and occipital vessels, some of which were still somewhat tender. The left optic disk was pale. There was perception of hand movements with the left eye in the lower temporal field only. The left pupil reacted sluggishly to direct illumination. A blood count showed a mild normocytic anaemia with a leucocytosis of 11,500 per c.mm. The differential count was normal. The E.S.R. was 99 mm. in the first hour.

One month later her vision had improved to 6/60 with the left eye, and the density of the visual field disturbance was diminished.

Comment.—The incompleteness of the visual loss and its tendency to recover suggests, in the absence of obvious retinal change, that there was an incomplete or transitory occlusion of the central retinal artery.

Case 8

A man aged 72 developed in September, 1951, pain in the head of diffuse nature with malaise, anorexia, and slight fever. The pain increased in severity, and after two weeks he awoke to find that he was blind.

Examination showed tender thrombosed temporal vessels with some reddening of the overlying skin. There was no perception of light in either eye, and the pupils were dilated and fixed. The optic disks were normal. The blood pressure was 200/110. The constitutional and local symptoms subsided rapidly, leaving the patient permanently blind.

Case 9

This patient, a woman aged 78, was one of nine further patients suffering from temporal arteritis, in none of whom was there any central nervous complication. The history and findings in her case were typical of this group. She first complained of headache in the occipital and left temporal region in November, 1951. This symptom increased, and after 8 to 10 weeks there was complete loss of appetite. The pain was now severe and prevented sleep. A moderate bilateral conjunctivitis had developed. Her temperature was 100° F. (37.8° C.) and pulse 110. There was tenderness over the left temporal vessels, which were thrombosed and tortuous. Any contact or draught on the left side of the head was resented. The blood pressure was 220/120. A blood count showed: haemoglobin, 80%; white cells, 15,800 per c.mm. (87% polymorphs); E.S.R., 54 mm. in the first hour.

There was a quite rapid symptomatic and clinical improvement following the administration of mist. sod. salicyl. (N.F.). After four weeks the scalp tenderness was barely perceptible and appetite was returning. There was no fever.

Six weeks later her weight was increasing and pulsation could be felt in the previously occluded vessels.

Summary

The clinical course of nine patients suffering from temporal arteritis is described. The following points emerge: the patients are without exception elderly, often of arthritic disposition, and arteriosclerotic; the disease runs a protracted though benign course but may leave permanent damage to vision; temporal arteritis is a not uncommon cause of sudden visual failure in the elderly, and the underlying disease may be overlooked if the symptoms have not been severe or if they have occurred some weeks or months before; salicylates are of value, at least in the relief of symptoms. The ischaemia of the scalp may be sufficient to result in necrosis.

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DIETARY "FIBRE" AND PREGNANCY TOXAEMIA†

BY

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Amongst the numerous hypotheses which have been put forward from time to time to account for the cause of pregnancy toxæmia is the "dietary" hypothesis. The most consistent advocates of this have been Theobald in the United Kingdom and Dieckmann in the United States.

Despite the fact that a consideration of the possible dietary factors has so far been unproductive of conclusions on the role of any one factor in the cause of the disease, the evidence indicates that a relationship of diet with toxæmia exists. The problem is to examine all the facts where the relationship seems to exist and try to fit them into a unified pattern.

A study of the literature reveals observations which apparently cannot be reconciled. For example, Ebbs, Tisdall, and Scott (1941) found that toxæmia and the incidence of stillbirth and neonatal deaths are more common in women with "poor" diets than in those with "good" diets or in those with poor diets supplemented throughout pregnancy with oranges, tomato pulp, wheat germ, milk, and vitamin D. How are these findings to be reconciled with the observation that toxæmia is very rare in some native populations living on so-called poor diets, and also with the findings that

the incidence of eclampsia fell in Germany during the last two years of the 1914-18 war, and in the Netherlands during the 1939-45 war—that is, in periods of relative famine?

Diet and Toxaemia in Sydney

In a review of the monthly incidence of eclampsia in two hospitals in Sydney during the period 1938-45 I showed that eclampsia was more common from May to September (winter), when fruit and vegetables were scarce, than it was from November to March (summer) (Hipsley, 1949). In 1942, when there was a severe shortage of vegetables, the incidence of eclampsia was comparatively high, and the combined stillbirth and neonatal deaths reached record heights. The notion that this shortage may have contributed to the increased morbidity was strengthened by experience in New Guinea, where it was noted that native diets are predominantly vegetarian and that toxæmia is very rare. These observations suggested that there may have been a dietary factor which operated in the diet of peasant vegetarian communities and in the good diets of civilized communities but was apparently absent from poor diets of civilized communities.

Eclampsia in the Fiji Islands

In 1950 Bell and Wills noted a pronounced racial difference in the incidence of eclampsia between the indigenous Fijians and the Indians living in Fiji. In the three years 1947-9 there were 18 cases of eclampsia in 1,106 Indian confinements, while there were no cases in the same period in 717 confinements of Fijians. In 1949 there were 27 cases of pre-eclampsia in 416 Indian confinements, but no cases in 266 Fijian confinements.

The indigenous Fijians and the Indians living in the Fiji Islands are each a well-defined racial group differing widely in social, religious, and dietary habits. Such a situation seemed to offer a unique opportunity for the study of the dietary background of the disease. The staple food of the Fijian is a starchy fruit vegetable of which relatively large quantities are eaten, together with bananas, coconut, papaw, leafy greens, and small quantities of meat, fish, and crabs. The important foodstuffs in the Indian diet are flour (sharps), white rice, coconut oil, ghee, sugar, with small quantities of dhal, meat, milk, vegetables, and fruit. The bulk of this diet consists of the refined foodstuffs, white rice and flour (sharps).

A comparison of the diets of the two races shows that they differ greatly in "fibre" content (see Table I). This observation, together with the Sydney observations previ-

TABLE I.—Fibre Content of Diets of Indians Living in Fiji Compared with New Guinea Diets

Indian*				New Guinea†			
Foodstuff	g./Day/Head	Fibre† g./Day	Calories	Foodstuff	g./Day/Head	Fibre† g./Day	Calories
Bread	7.8	V.L.		Taro	106	1.80	
Sharps (flour)	317	V.L.		Sweet potato	170	1.70	
Rice, white	208.4	V.L.		Bananas	67	0.67	
Dhal	45.7	1.84		Yams	680	6.80	
Ghee	24.2	0		Pumpkin	17	0.17	
Coconut oil	35	0		Tapioca	17	0	
Potatoes	73.8	0.74		Brown rice	2.8	0.03	
Onions	3	0.06		Coconuts	39	1.24	
Sugar	54.9	0		Green leaves	2.8	0.45	
Milk	68	0		Papaw	28	0.28	
Vegetables and fruit	Small amount	V.L.		Fish	120	0	
Meat and fish	9.6	0					
Butter	3.7	0					
Total		>2.64	2,896	Total		13.14	1,600
		>0.9	1,000			8.2	1,000

* Bell and Wills, 1950.

† No quantitative assessment of Fijian diets is available. Quantitative data for Kaviaria (a village in the Trobriand Islands) have been used (see Report on the New Guinea Nutrition Survey Expedition, 1947. Department of Territories, Commonwealth of Australia, 1950.)

‡ The calculations for the fibre content of diets have been made using tables published by Nicholls (1951).

V.L.=Very little.

ously mentioned, suggested that further evidence be sought on whether a deficiency of dietary fibre could be concerned in the causation of toxæmia.

It was of interest to find out whether the incidence of eclampsia was high in the areas from which the Indians living in Fiji had emigrated—that is, Southern India—and whether the diets were similar. Mudaliar (1938) states that there were 148 cases of eclampsia in two years at his hospital in Madras; and Indian obstetricians who have worked in Southern India are unanimous in stating that eclampsia is very common there, and much more common in the cities than in the rural areas. Dr. Sunanda Bai (1952), an obstetrician who has worked in both the southern and the northern provinces of India, states that eclampsia is much less common in the northern provinces, especially in the Punjab, "where the diet is much better balanced and contains home-pounded wheat (instead of flour), more vegetables, more fruit, and more milk." Theobald (1946) has drawn attention to the very high incidence of eclampsia in the native population of Colombo (Ceylon), where the diet pattern is very similar to that of Southern India.

On the other hand, the diet pattern of the Fijians resembles closely that of the natives of New Guinea, amongst whom toxæmia is a rare disease.

Eclampsia and the Diet of Other Native Communities

Among the natives of the Transkei eclampsia is rare. The diet consists of meal porridge, milk, eggs, and a very small amount of meat (Crichton, 1947).

From reliable authorities, all of whom have had considerable experience in medical work in various native communities, information has been collected concerning the incidence of eclampsia and the diet pattern. Professor J. H. de Haas (1952), of Leyden, said that pregnancy toxæmia was very rare in Java. There the diet consisted of crudely milled and pounded rice, starchy root vegetables, some maize, and some leafy greens. Where fish was available this was eaten. Pregnancy toxæmia was very uncommon in the Celebes according to Dr. de Wijn (1952), of Leyden. The diet consisted mainly of home-pounded rice, leafy greens, coconut, and only a small quantity of starchy root vegetables, melons, and fruit. On the coast some fish was eaten. It is noteworthy that in these communities, where toxæmia was uncommon, the diet was comparatively rich in fibre.

Trends in Eclampsia in War-stricken Countries

One of the most notable features of eclampsia is that the incidence has been observed to vary in the same geographical area, apparently as a result of a marked change in the environment. Thus a change in eclampsia incidence has been particularly noticeable in war-stricken countries. The effect of war has been by no means consistent: apparently it has sometimes been adverse and at other times beneficial.

Hong Kong.—King and Ride (1945) reported that in Hong Kong in 1940-1 there was a striking increase in the incidence of eclampsia, reaching almost epidemic proportions. This coincided with a serious outbreak of beriberi. Eclampsia

TABLE II.—Showing Correlation of Fibre Content of Diet with Incidence of Eclampsia or Pregnancy Toxaemia

Group	Description of Diet	Dietary Fibre Grading*	Eclampsia† or Toxaemia	Authority
New Guinea natives	Starchy roots, green leaves, nuts, fruit, plus small amounts of fish and meat	++++	0	Hipsley (1949); Bell and Wills (1950)
Fijians	Home-pounded wheat, starchy roots, pumpkin, fruit, plus a little milk	++++	+	Bai (1952)
Transkei (South Africa)	Meal porridge, milk, eggs, and small amount of meat	++++	0	Crichton (1947)
Java	Home-pounded rice, green leaves, maize, starchy roots, little fish	++++	+	de Haas (1952)
Celebes	Home-pounded rice, greens, coconut. Small amounts of vegetables, melons, and fruit	+	++++	de Wijn (1952)
Indians (Fiji)	Polished rice, flour (sharps), ghee, coconut oil, dhal. Small amounts sugar, meat, and vegetables	+	++++	Bell and Wills (1950)
Indians (South India)	Ditto	+	++++	Mudaliar (1938); Bai (1952)
Colombo	Ditto	+	++++	Theobald (1946)
Europeans (Toronto) "poor" diet group	Inexpensive high-energy-yielding foods. Minimum of "protective" fruit and vegetables which are more costly	Increased	Reduced	Ebbs, Tisdall, and Scott (1941)
Europeans (Toronto) "good" diet group	Increased consumption of fruit and vegetables			

TABLE III.—Showing the Apparent Effect of a Change in Fibre Content of the Diet on the Incidence of Eclampsia or Toxaemia

Group	Period of Change	Dietary Change	Dietary Fibre Grading*	Eclampsia† or Toxaemia	Authority
Hong Kong	1939	Mixed diet	+++	++	King and Ride (1945)
	1940-1	To polished rice	+	+++	
	1945	To mixed diet	+++	++	
Netherlands	1940	Mixed diet (70% extra bread)	+	Reduced	Holmer (1947)
	1944	To food shortage (90% extra bread) and starchy roots and vegetables	+	Increased	
		To relief of famine, refined high-calorie foods (70% extra bread)	+	Reduced	
Scotland	1939	Mixed diet containing 70% extra bread	+++	+	Baird (1952)
	1942 et seq.	To 85% extraction bread and more vegetables	+++	+	
			+++	+	
Sydney	1939	Mixed diet	+++	+	Hipsley (1949)
	1942	To acute shortage of vegetables	+++	+	
	1943	To normal mixed diet	+++	+	
"	Summer	Mixed diet containing moderate fruit and vegetables	+++	Increased	Hamlin (1952)
	Winter	To reduced consumption of fruit and vegetables	++	+	
	Control of weight gain in pregnancy	Restriction of concentrated high-energy foods with increased consumption of fruit and vegetables	++	0	

* Fibre grading (approximate): ++++ Very high=above 4 g./1,000 cal. +++ High=2-4 g./1,000 cal. ++ Moderate=1-2 g./1,000 cal. + Low=below 1 g./1,000 cal.

† Incidence of eclampsia (approximate): ++++ Very high=8 eclampsias/1,000 deliveries. +++ High=2-8 eclampsias/1,000 deliveries. ++ Moderate=1-2 eclampsias/1,000 deliveries. + Low=below 1 eclampsia/1,000 deliveries. 0 Absent or very low.

*The term "fibre" as used in this paper includes lignin, cellulose, and the hemicelluloses.

†Some of this work was carried out during the tenure of a World Health Organization Fellowship in 1952, but the statements made and the opinions expressed are not necessarily those of the Organization.

was particularly common in the beriberi cases, and Browne (1944) has commented that the data of King and Ride show that eclampsia was 50 times more common in women with beriberi than in those without it. On the other hand, vitamin B₁ has proved valueless either in the prevention or in the treatment of the disease. It is of interest to examine the changes in diet which resulted in this increase of beriberi. King and Ride state that there was a change from a relatively mixed diet to one of polished rice, owing to an influx of refugees from war areas, with consequent poverty and overcrowding of the city. After the war the eclampsia had declined to the original 1938 level, and the beriberi incidence had declined also (King, 1947). Burgess (1952) has pointed out that since the war less white rice has been available in Hong Kong. The change in the fibre content of the diets of Hong Kong would seem to run parallel with the change in the incidence of eclampsia.

Netherlands.—Contrary to experience in Hong Kong, the impact of war apparently had a beneficial effect on the incidence of eclampsia. Holmer (1947) and Duncan, Baird, and Thomson (1952), the latter using data supplied by Posthuma and others, have reported that the incidence of toxæmia fell in the Netherlands from 1940 to 1945, but rose again after the war to almost its pre-war level. Holmer states that in Holland during the food shortages pregnant women did remarkably well. There were few cases of eclampsia, but immediately after the relief of the famine he saw seven cases, three of which were fatal. The first food distributed to the starved population had a high caloric value, and consisted mainly of fats, protein, and sugar; it was also very salty. During the war the diet pattern in the Netherlands altered as food became scarcer. Bread, which before the war was made from 70% extraction flour, was made from flour which at times was 90–95% extraction; turnips and potatoes became much more prominent in the diet; and in 1944, during the worst period of famine, even linseed meal, tulip bulbs, and sugar beets were eaten. There is no doubt that the fibre content of the diet increased from 1940 to 1944 and has decreased again since that date.

Scotland.—Duncan, Baird, and Thomson (1952) have shown that in Scotland from 1943 onwards a steady and considerable fall occurred in the stillbirth rates resulting from toxæmia. This fall they attributed to "improvement from 1941 onwards in the efficiency of the physiological mechanisms which govern the growth and vitality of the foetus." They thought the improvement was unlikely to have been due to better antenatal care, but was probably due to improved economic conditions, assisted by the effects of scientific rationing. An important widespread change in the diet was the change from 72% extraction bread to 85% early in 1942. The fibre content of 70% extraction flour is negligible, while that of 85% extraction is 1%. This single change in bread, a staple foodstuff, would have brought about a widespread increase in the fibre content of the diet from approximately 1.2 g. per 1,000 calories to 2.4 g.

Effect of Control of Weight Gain in Pregnancy

Hamlin (1952) published the results of a three-year attack on eclampsia at the Crown Street Women's Hospital in Sydney. He claims that eclampsia has virtually been eliminated by changing the diet from a "high-carbohydrate, low-protein diet to a low-carbohydrate, high-protein, high-vitamin diet before mid-pregnancy." These measures were coupled with increased antenatal supervision and control of excessive weight gain in mid-pregnancy by dieting. The dietary changes advocated by Hamlin would have the effect of increasing the intake of fibre. Especially is this so in the case of diets designed to limit weight gain in pregnancy, where the restriction of the concentrated high-calorie foods such as flour, sugar, and fats is countered by an increased intake of the more bulky but less fattening fruits and vegetables.

In assessing Hamlin's results it should be noted that eclampsia—that is, the actual occurrence of fits—can often be prevented by careful supervision and treatment of tox-

aemia patients. In other words, the incidence of eclampsia is susceptible to antenatal care, and does not always bear a true relationship to the incidence of toxæmia, especially where there is a high standard of obstetric service. Baird (1952) is of the opinion that the combined stillbirth and neonatal death rate has a much closer relationship with the true toxæmia incidence, because these morbid conditions are so often the result of toxæmia. Unfortunately Hamlin does not give evidence on the incidence of toxæmia (without eclampsia) or on the combined stillbirth and neonatal death rates.

Toxaemia in Poor and Good Diets of Urban Communities

One of the characteristic features of poor urban diets is that people tend to satisfy hunger with concentrated energy-producing foods which are cheap, whilst neglecting the more costly "protective" foods, such as fruit and vegetables. These foods, in addition to being rich in minerals and vitamins, also contain fibre. Ebbs, Tisdall, and Scott (1941) demonstrated that good diets and poor diets, supplemented with a number of fruits and vegetables (see above), apparently had a beneficial effect on the incidence of toxæmia. These diets undoubtedly had a higher fibre content than the poor diets.

In review, most of the above observations relating diet to the incidence of pregnancy show that toxæmia is more common where the fibre content of the diet is low. The evidence for this is summarized in Tables II and III.

Summary

The incidence of pregnancy toxæmia in various groups of people consuming widely different diets, together with observations of trends in the incidence of this disease in the same group of people but at different periods (such as during wartime), has been discussed.

The suggestion is made that some factor or factors associated with the "fibre" content of the diet tend to inhibit the occurrence of toxæmia.

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From the *Gentlemen's Magazine*, August, 1853: "The Royal Family has been suffering from measles. It first appeared on H.R.H. the Prince of Wales, who in consequence was absent from his brother's [Prince Leopold's] christening. On July 8 it was announced that Prince Albert [Prince Consort] was attacked, and on the 19th that Her Majesty also had the complaint. Meanwhile all the royal children except the first have successively taken the infection. The whole Royal Family have passed through the disease very favourably. On July 6 the foundation stone of the Medical Benevolent College was laid in Epsom . . . H.R.H. Prince Albert, who had promised to lay the stone, was absent from illness."

PROSTATIC DYSPEPSIA

BY

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Although "silent prostatism" is a well-recognized clinical condition, it is surprising how few references to it occur in the current literature, and, with one or two possible exceptions, mention of the condition is conspicuous by its absence from the standard undergraduate and postgraduate textbooks of surgery and urology. Ewert and Summons (1951) have drawn attention to the not uncommon insidious onset of prostatic obstruction. They have emphasized that this condition may present itself with symptoms unrelated to the genito-urinary tract, and state that these symptoms are due to varying degrees of renal insufficiency.

Silent prostatism is more common than is generally realized and may present as a gastro-intestinal disturbance, with a history suggestive of carcinoma of the stomach or early hepatic cirrhosis in the absence of urinary symptoms and before there is biochemical evidence of renal insufficiency or azotaemia. Eighteen cases of this type were encountered during the last five years in a series of just over 200 patients who had undergone prostatectomy.

The presenting symptoms of this syndrome, which may well be called "prostatic dyspepsia," are upper abdominal discomfort or pain, nausea, and anorexia. Urinary symptoms are absent, but the residual urine is invariably much increased and the cystoscopic appearances confirm the diagnosis. The following case histories are typical.

Three Case Reports

Case 1.—A man aged 73 was admitted to a medical ward for investigation. He had a four-months history of dyspepsia, anorexia, and vomiting with loss of weight. Barium meal examination and fractional test meal and liver-function tests showed nothing abnormal. Blood urea was 27 mg. per 100 ml. An intravenous pyelogram showed normal function of both kidneys, but a large filling defect at the base of the bladder and considerable vesical retention in the post-micturition film. Cystoscopy was attempted, but the instrument was not long enough to get through the prostate, which could be felt above the symphysis pubis when the bladder was empty. A one-stage prostatectomy was carried out and a gland weighing 340 g. was removed. Three months after operation the patient declared himself to be in perfect health with complete restoration of his digestive powers.

Case 2.—This patient, aged 65, was referred by his general practitioner with a history of four months' anorexia, pain, and nausea. He had lost 2 stone (12.7 kg.) in weight. He would admit to no urinary symptoms. Barium meal, test meal, and liver-function tests revealed no abnormality. Blood urea was 34 mg. per 100 ml.; haemoglobin, 76%. The history was so typical of gastric carcinoma that laparotomy was advised. This was performed, but no lesion of the stomach or intestines was detected. When the hand was palpating the pelvis the bladder was felt to contain several ounces of urine. Subsequent investigations showed a residual urine of 8 oz. (230 ml.), a normal intravenous pyelogram, and a moderately trabeculated bladder. The man did not rise at night to pass his water and had complete control with no delay or urgency. Removal of a small prostate (24 g.) cured his digestive symptoms, and his weight was back to normal three months after operation.

Case 3.—A man aged 68 attended his doctor complaining of feeling out of sorts with loss of appetite and constipation. He had no urinary symptoms, sometimes rose once at night to micturate, but passed urine with a good stream. On examination he had a bladder palpable 3 in. (7.5 cm.) above the symphysis pubis. The prostate was moderately enlarged but benign. The blood urea was 36 mg. per 100 ml., and the urine was uninfected. An intravenous pyelogram showed normal concentration in the kidneys with no hydronephrosis. The bladder shadow was enlarged. Cystoscopy showed moderate intravesical projection of the prostate and trabeculation of the bladder, with 30 oz. (850 ml.) residual urine. This examination precipitated an acute retention of urine, so a closed transvesical prostatectomy was performed 24 hours later. Convalescence was delayed by a femoral thrombosis, but when seen three months after operation, although he still had a little swelling of the leg, he said he was feeling fitter than for some time.

Remainder of Series

Fifteen other cases of the condition have been seen, a summary of whose clinical histories are tabulated below.

Details of Cases

Age	Predominant Symptom	Initial Provisional Diagnosis	Blood Urea mg./100 ml.	Urine	Residual Urine	
					oz.	ml.
74	Anorexia	Carcinoma of stomach	34	Sterile	8	230
72	Epigastric discomfort	" "	39	"	6	170
58	"	" "	31	"	14	400
60	Nausea	Gastric ulcer	44	Infected	6	170
64	Epigastric discomfort	Duodenal ulcer	32	Sterile	18	510
70	Anorexia	Cirrhosis	37	"	6	170
78	Nausea	"	40	"	14	400
61	Anorexia	Carcinoma of stomach	28	"	20	570
74	Nausea	Gastric ulcer	31	Infected	8	230
72	Epigastric discomfort	" "	42	Sterile	23	655
82	"	Duodenal ulcer	36	"	8	230
76	Nausea	Carcinoma of stomach	45	"	6	170
72	Epigastric discomfort	Gastric ulcer	29	"	15	425
70	Anorexia	Carcinoma of stomach	31	"	10	285
54	"	Cirrhosis	38	"	22	625

Comment

It is a well-recognized fact that patients who have had a prostatectomy frequently volunteer the information after the operation that they feel fitter than they have felt for some time. The observation is not limited to those in whom there has been some degree of uraemia.

Several of the patients in this series were submitted to detailed investigations, including urea concentration and clearance tests, blood alkali reserve, etc., and in none has there been evidence of renal impairment.

The cause of the syndrome of dyspepsia, nausea, and anorexia, associated with prostatic obstruction which has not gone on to the stage of renal impairment, is not clear, but is in my submission a definite entity which is not generally recognized until uraemic symptoms supervene. It would seem that the importance of these cases, which in my experience account for a little over 5% of all patients requiring prostatectomy, lies in the fact that, unless the clinician concerned, usually not a surgeon or urologist, is alive to the possibilities of prostatic obstruction being the underlying cause, the patient may be sent away after a negative gastro-enterological examination or submitted to an unnecessary laparotomy, when the catheter to measure the residual urine or the cystoscope will make the diagnosis clear.

Summary

A syndrome of epigastric pain, nausea, and anorexia is a not uncommon initial complaint in patients with prostatic obstruction without urinary symptoms.

A series of eighteen patients are described with this syndrome in whom there was no real evidence of renal impairment.

The importance of the condition lies in the fact that after a negative gastro-enterological investigation it can be, and often is, overlooked until uraemic symptoms supervene.

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HYPERPARATHYROIDISM WITH NORMAL SERUM CALCIUM

BY

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Osteitis fibrosa cystica was first described by von Recklinghausen in 1891, but the first clear demonstration that a parathyroid adenoma was the cause came in 1925, when Mandl cured a man crippled with the disease by the removal of such a tumour. Since then our knowledge of the disease, its clinical, radiographic, and biochemical features, has steadily increased, though as recently as 1950 Rienhoff estimated that there were only 597 proved cases in the world's literature or known to him personally. Thus the disease is rare enough to warrant a record of every case, especially when there are any unusual findings, and since treatment is so effective.

Case Report

A spinster tea-packer aged 33 first consulted her doctor in February, 1951, because of "rheumatism" in the legs and back for five months. Before this her health had been good; she had lived an active life and had played tennis during the previous summer. The aching pain had started in her right thigh rather suddenly in September, 1950, and had spread in several weeks to involve the lower back, thighs, and knees. The pain was made worse by movement, but did not prevent sleep. She noticed increasing weakness in the legs, so that walking, especially starting off, became difficult: a waddling gait developed. These disabilities caused her to stop her work at Christmas, 1950. The symptoms became increasingly severe; some aching and weakness developed in the right shoulder, and a painful lump appeared below the manubrium sterni. She had noticed some frequency of micturition, which disturbed her twice each night.

She was referred to the medical out-patient department, where the most striking abnormality was her gait as she entered the room. It resembled the waddling of a duck, and was thought to be due to muscular weakness, especially of the hip abductors. She was of stocky build, and had a marked thoracic kyphosis, which, though present since childhood, she thought had become more pronounced. The bones were not tender, and passive movement of the limbs was full and pain-free. There was definite muscular weakness of the abductors, flexors, and extensors of the hip-joints, but no wasting and no reflex or sensory changes. Examination of the neck, lungs, heart, and abdomen was normal. The blood pressure was 130/90 and weight 8 st. 9 lb. (54.9 kg.). There was a tender bony lump in the sternum between the third

costal cartilages. X-ray examination of the pelvis revealed a generalized osteoporosis, so she was admitted for investigation with a tentative diagnosis of hyperparathyroidism.

Investigations.—In order to confirm the clinical diagnosis and to exclude in particular multiple myelomatosis and polyostotic fibrous dysplasia (Albright's disease) extensive investigations were made. Skeletal x-ray films revealed generalized osteoporosis, with a "moth-eaten" appearance in the skull (Fig. 1), and early fibrocystic areas, especially in the pelvis and right upper humerus. There was a fracture of the body of the sternum, and a loss of the lamina dura of the teeth. No calcification was seen in the renal tract. Four pre-operative serum calcium estimations (10.8, 10.32, 9.8, and 9.7 mg. per 100 ml.) during three months were within the normal range: the method used was that described by Trevan and Bainbridge (1926). Two out of the three plasma phosphorus estimations (1.7, 2.2, and 1.8 mg. per 100 ml.) were, however, below normal limits. The serum alkaline phosphatase was 92.4, 94.4, and 98.0 King-Armstrong units per 100 ml. at monthly intervals. The blood urea (34 mg. per 100 ml.) and urea clearance were normal, as were the serum proteins (total, 6.7 g.; albumin, 4.16 g. per 100 ml.). An eight-day calcium balance showed that on an intake of 97 mg. daily her average urinary excretion was 322 mg. and faecal excretion 162 mg., a daily negative balance of 387 mg. The combination of low plasma phosphorus and a negative calcium balance, even in the presence of normal serum calcium, made the diagnosis almost certain.

A sternal bone biopsy showed osteoclastic destruction of bone trabeculae associated with proliferation of fibrous tissue. There was very little evidence of new bone formation and there was no mosaic pattern in the islets. The appearances were those of osteitis fibrosa cystica.

A blood count showed: red cells, 4,300,000 per c.mm.; Hb, 11.9 g. (80%); colour index, 0.9; E.S.R. 4 mm. (Wintrobe corrected); white-cell count, normal. There were no casts, cells, or albumin in the urine.

Operation.—On June 11, 1951, Mr. E. G. Muir explored the neck through the usual collar incision. A normal parathyroid gland was identified on the left side, but a small parathyroid adenoma was found attached to the right lower pole of the thyroid. It was removed by dividing the short pedicle. The adenoma was deep red in colour with a smooth surface; it measured 1.8 by 1 by 0.8 cm. and weighed 0.9 g. Microscopical examination showed parathyroid tissue composed almost entirely of "wasserhelle" cells.

Subsequent Course.—The patient was given 2 pints (1,140 ml.) of milk, 60 gr. (4 g.) of calcium lactate, and 10,000 units of calciferol daily from three days before operation until six months afterwards. The bone pain vanished immediately after operation, and muscle strength returned within a few weeks. Five days after operation latent tetany was detected by a positive Chvostek's sign; at that time the serum calcium was 7.9 mg. per 100 ml. The dose of calcium lactate was increased to 240 gr.

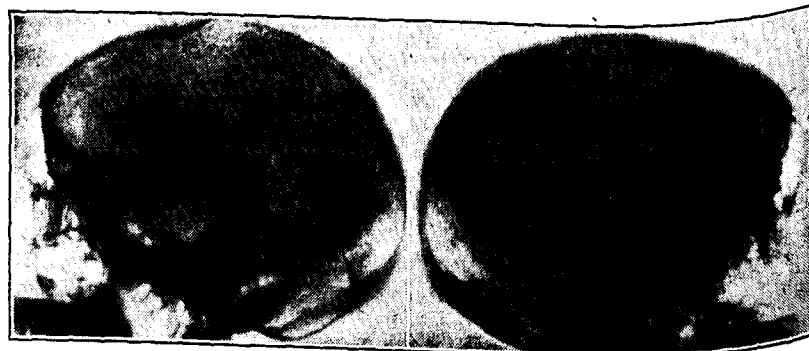


FIG. 1

FIG. 2

FIG. 1.—Skull. Moth-eaten osteoporosis. FIG. 2.—Skull. Six months after operation.

(16 g.) daily. The sign disappeared after two days, and thereafter convalescence was uneventful. Subsequent biochemical tests are recorded in Fig. 3. On the sixteenth day the daily urinary excretion of calcium had fallen to 40 mg. despite an intake of more than 3,900 mg. of calcium ion. Three months after operation radiographs of the bones showed much recalcification; the gait was normal and the patient symptom-free. Six months after operation radiographs were almost normal (Fig. 2), and the phosphatase had fallen to 14.7 units per 100 ml. All treatment was then stopped.

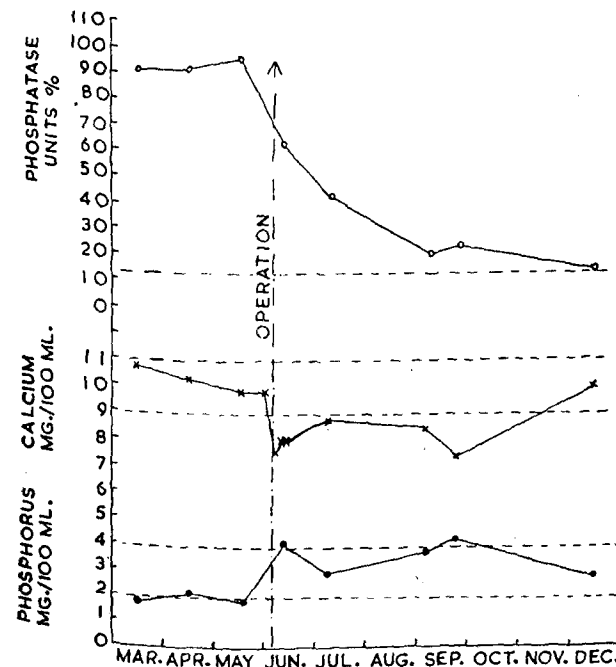


FIG. 3.—Serial estimations of serum alkaline phosphatase, serum calcium, and plasma phosphorus. Normal ranges are shown thus ———.

Discussion

This case is of special interest because of the very short duration of symptoms, the normal serum calcium, and the rapid and complete response to treatment. Most reported cases have had symptoms for more than two years before the diagnosis has been made (Norris, 1947). The importance of early diagnosis is seen in Rienhoff's own 27 patients, who were followed for several years: within a few years of operation 10 died from uraemia or hypertension following nephrocalcinosis. In general, the fatalities were among those with the longest histories before operation and those with renal damage.

Since the prognosis is so much improved by early diagnosis, the early symptoms of hyperparathyroidism merit emphasis. They are usually described as: (1) due to decalcification of the skeleton—aching bones, deformities, spontaneous fractures; (2) due to hypercalcaemia—polyuria, thirst, renal pain; or (3) due to hypercalcaemia—anorexia, nausea, constipation, muscular weakness, increasing muscular fatigue, waddling gait.

Although this patient had the symptoms usually ascribed to hypercalcaemia, her serum calcium was in fact within normal limits. Four estimations were made in three months, by an experienced technician, at a time when the patient had marked symptoms from the disease. It is obvious that these symptoms may be caused by factors other than hypercalcaemia.

Gutman and his colleagues (1936), reviewing the serum calcium levels of 114 cases of hyperparathyroidism, found values below 11 mg. in five only and below 12 mg. in 23

only. They thought that normal serum calcium values could be explained in one of four different ways.

1. **Renal Failure.**—This commonly occurs in cases of long duration. It causes phosphate retention with secondary depression of the serum calcium level. This is well illustrated by Case 2 of Gutman *et al.*, in which renal failure occurred while the patient was in hospital, with a fall in calcium from 12.4 to 10.5 mg. along with a rise in phosphorus from 3.9 to 6.1 mg.

2. **Hypoproteinaemia.**—Normally about 50% of the total serum calcium is bound to protein; the remainder is ionic calcium, and it is this fraction which is raised in hyperparathyroidism. Coincidental hypoproteinaemia, with a low protein-bound fraction, may thus mask a pathologically high ionized calcium when the total serum calcium is normal.

3. **Insufficient Testing.**—Sometimes a normal value is found in an isolated test, but repeated estimations show the typical elevation. For instance, the initial estimation of Case 2 of Albright *et al.* (1934) showed a level of 10.4 mg.; on subsequent testing it was 12.3 mg.

4. **Short Duration of Symptoms, with Normal Kidneys.**—Under these circumstances the excess calcium mobilized from the bones can be excreted without accumulation in the blood: such is the explanation in the present case. The kidney-function tests were normal, as were the serum proteins; the disease was active as judged by the bone pain and negative calcium balance, yet the serum calcium was normal on four occasions during three months.

Summary

An example of hyperparathyroidism is described in which the duration of bone pain and weakness was only five months and the serum calcium was normal. The early symptoms of the disease are reviewed and emphasized. The normal serum calcium was thought to be due to effective excretion of calcium by the kidneys. A parathyroid adenoma was removed successfully and the patient's health restored.

I wish to thank Dr. Clifford Hoyle, under whose care the patient was admitted, for help with this paper; Mr. E. G. Muir, who did the operation; Dr. A. M. Rackow for the radiographs; Professor C. H. Gray for the biochemical investigations; and Dr. B. S. Cardell for the histology.

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The outstanding social problem of our age, particularly in northern towns, is unsatisfactory housing, says Dr. C. Metcalfe Brown, medical officer of health to the city of Manchester, in his annual report. "Notwithstanding the strenuous efforts of the housing department in providing new houses," he writes, "the housing position in the city is bad. Hundreds of cases annually seek the help of the health department for the alleviation of hardship caused by wretched housing conditions. The department takes all action within its power, but this action is severely limited by the controlling factor—namely, the grave shortage of new houses. Enormous distress is being caused to thousands of Manchester people because of the inadequacy of housing accommodation. The health, happiness, and integrity of family life cannot be achieved and maintained to the full unless housing is good."

TREATMENT OF LIME BURNS OF THE EYE WITH CORVASYMTON AND UNDERMINING OF CONJUNCTIVA

BY

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The satisfactory results of the treatment of chemical burns of the eye with "corvasymton" as reported by Fischer, Hodgson, and Wagenaar (1950) and Wagenaar (1952) drew my attention to this new preparation. Its use started quite accidentally when in a carbide burn of the eye it was instilled by mistake instead of vitamin A oil. The cornea was clear and transparent after instillation every 15 minutes for three hours. A generous supply of corvasymton enabled me to carry out an intensive treatment of several cases of lime burns of the eye. Here is a record of some of them.

Case 1

On June 24, 1952, a 23-year-old man was hit on the right eye by a handful of quicklime thrown at him by a fellow workman. When at last the eye was cleansed of all particles of lime, by means of copious irrigations with saline solutions and by pledgets of cotton-wool carried on a conjunctival forceps, the lower third of the cornea presented a porcelain-white appearance. The remaining part of the cornea was so hazy that the iris could scarcely be seen. The conjunctiva of the entire lower fornix was greyish white in colour, and showed such a severe degree of chemosis that no blood vessels could be seen. Vision was reduced down to vague hand movements.

The eye was immediately operated upon. The "necrotic" conjunctiva was loosened up by means of a straight keratome along the limbus corneae in a sector between 5 and 7 o'clock and extensively undermined in a peripheral direction down to the fornix. The conjunctiva was cut at the limits of the undermined area so that a trapdoor flap with the hinge at the fornix was formed. A portion of the sclera was laid bare. No part of the conjunctiva or subconjunctival tissue was removed. There was no loss of blood. This fact suggests that there was occlusion of the blood vessels. The eye was irrigated with corvasymton 10% and instillation continued every hour.

The chemosis soon started to subside and the conjunctiva regained very gradually its normal pink colour. The cornea took a longer time to acquire its bright healthy appearance. The cloudiness of the upper part of the cornea was the first to disappear, and, except for one tiny spot at 6 o'clock near the limbus, the porcelain-white patch cleared off completely. There remained, however, a small narrow symblepharon deep down in the lower fornix in the same line as the spot on the cornea; it never showed any sign of increasing in extent, and no further intervention was necessary.

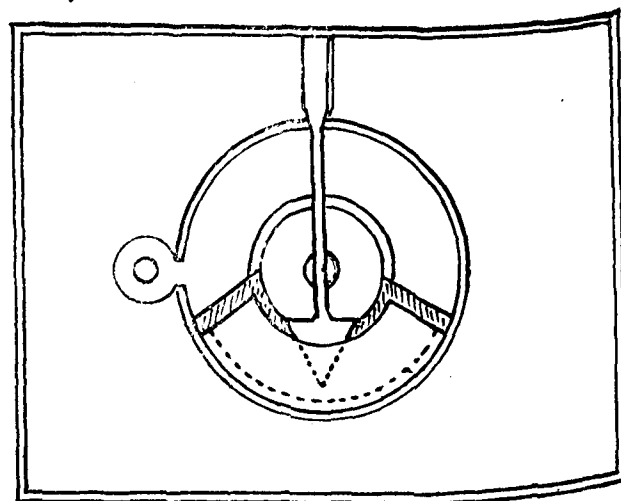
Vision in both eyes was 6/12 unaided and 6/6 with glasses. There was never any sign of a rise of intraocular tension and there were no corneal vascular changes. Atropine was never used. The patient was discharged three weeks after admission. I think that, had I loosened up the conjunctiva at the limbus along a wider section, both the corneal opacity and symblepharon would have been prevented.

Case 2

On July 17, 1952, a 17-year-old youth was admitted into hospital for a lime burn of the right eye. On examination the cornea and conjunctiva presented much the same degree of injury as Case 1. No blood vessels were to be seen on the chemotic conjunctiva of the lower fornix. There was a

porcelain-white patch on the lower part of the cornea. Diffuse cloudiness of the cornea was very marked. Vision was limited to hand movements.

As there was a considerable degree of blepharospasm, the patient was operated on under general anaesthesia. All residual particles of lime were removed. The same procedure was followed as in Case 1. However, in an attempt to prevent all possible complications, I loosened up the ocular conjunctiva on a much wider section—that is, between 3 and 9 o'clock (see Fig.). The eye was then irrigated with corvasymton solution and instillation continued hourly.



The chemosis gradually disappeared and the conjunctiva soon began to show its normal appearance. The conjunctival flap was noticed to gain reattachment to its scleral bed. The cloudiness of the cornea gradually disappeared. After one week the patient started to complain of pain in the eye. Instillation of fluorescein solution revealed a fairly large staining spot in the cornea near the limbus at 6 o'clock. The eye was kept bandaged between the instillations. After five days there was no sign of corneal staining.

When discharged after three weeks the cornea was clear and the lower fornix was completely free. No corneal vascularization was present. One month after being discharged the vision in both eyes was 6/6.

Case 3

A boy aged 8 was struck in the left eye by a piece of quicklime. The injury was localized mainly to the upper fornix region. The cornea was diffusely hazy and he could count fingers at one metre. Instillation of corvasymton every hour was immediately started. As the chemosis was not pronounced, no undermining of conjunctiva was performed. Three days later it was noticed that the conjunctiva in the inner angle of the upper fornix was very swollen. The patient was examined under general anaesthesia. A piece of lime had burnt its way deep into the conjunctiva, which was loosened up throughout the upper half of the limbus and deeply undermined peripherally. The piece of lime along with the conjunctiva was excised.

Recovery was quick and complete. When the patient was discharged two weeks later there was a small adhesion deep into the inner angle of the superior fornix corresponding to the excised parties of the conjunctiva. The cornea was completely free from opacities. Vision was 6/6.

Case 4

A man aged 35 was injured in both eyes by a splash of quicklime. The burn was mainly limited to the corneae, which were very hazy. There was a moderate degree of swelling of the ocular conjunctiva. Vision was reduced to counting fingers at one metre. Corvasymton was instilled every hour. No undermining was done. The corneae gradually acquired their normal brightness and the patient was discharged after 10 days.

Case 5

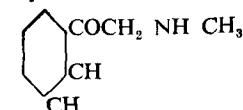
On September 8, 1952, a man aged 70 was admitted to hospital for a lime burn of the right eye. On examination the cornea was very hazy and vision was reduced to hand movements. The ocular conjunctiva was moderately swollen. The haziness of the cornea disappeared after two weeks. But there was a tiny persistent staining spot at 7 o'clock just within the limbus. When the patient was discharged after six weeks the cornea was clear except for a small dense opacity corresponding to the staining spot. The fornix was free.

Discussion

Corvasymton is an oxyphenyl-methylaminoethanol tartrate solution. It is related to "sympatol," which is closely allied to adrenaline: dioxyphenylmethylaminethanol. When corvasymton solution 10% is instilled into the eye, constriction of the vessels follows, but the permeability is not altered. The intraocular tension does not show any change and there is no evidence of any toxic action.

The curative effect of corvasymton cannot be attributed to its vasoconstrictory action. Burns treated with adrenaline in any concentration do not show any improvement. On the contrary, if adrenaline is instilled in a concentration higher than 1:1,000 the condition of the eye is made worse.

It is thought that the beneficial effect of corvasymton is due to the adrenalone which it contains. Adrenalone is dioxyphenyloxymethylaminoethanol



which is a keto form of adrenaline. It has been found (Loewi and Meyer, 1905; Dale, 1909) that adrenalone is much less toxic and has much less vasoconstrictory action than adrenaline. In solution of the latter the keto form of adrenalone is absent.

Besides the restoration of corneal transparency, the treatment of chemical burns of the eye has in view the prevention of adhesions between the conjunctiva and the ocular globe. As early as 1912 Denig removed the necrotic conjunctiva and replaced it by mucous membrane from the mouth. Thies (1928) again drew attention to the favourable effect of this treatment. However, in 1939, Passow noted that an oral mucosa graft was unnecessary, as the same results could be obtained by loosening up and undermining of the injured conjunctiva at the limbus corneae. In spite of its "necrotic" appearance, the conjunctiva is still capable of remarkable recovery.

In a chemical burn of the eye a deposit of the corroding agent is retained beneath the conjunctiva. Its gradual absorption, by impairing the nutrition of the sclera, cornea, and conjunctiva, gives rise to the well-known sequelae of chemical burns. By loosening up and undermining the conjunctiva at the limbus, the formation of a deposit is prevented and the subconjunctival tissue is laid open to the direct action of corvasymton.

I used to treat conjunctival and corneal chemical burns in the usual way—that is, by copious irrigation of saline solution or ammonium tartrate 10% solution; removal of all particles of the injurious material; frequent instillation of cod-liver oil, and insertion of a plastic contact glass to prevent formation of adhesions between raw surfaces. The most favourable cases took a long time to recover, and a completely clear cornea was an unusual result. In severe cases corneal opacities and wide adhesions were inevitable sequelae of the use of the contact glass.

I never had the opportunity to use tolazoline hydrochloride, which is a hyperaemia-inducing preparation recommended by Nagy (1951), nor transplantation of the oral mucosa (Denig-Thies operation).

The quick disappearance of the chemosis and the complete clarification of the corneal cloudiness and opacities which follow upon the frequent instillation of corvasymton, coupled with free loosening and undermining of the conjunctiva, are

so impressive that this preparation may be regarded as a very important asset in the treatment of lime burns of the eye.

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POLIOMYELITIS IN CHILDREN UNDER 6 MONTHS IN ENGLAND AND WALES DURING 1950

BY

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Logan (1952) in his report on the distribution of poliomyelitis in England and Wales in 1950 stated that 82 cases of poliomyelitis were notified in children under the age of 6 months.

In correspondence with the medical officers of the districts in which these 82 cases occurred we found that in fact 5 were over 6 months old. Of these 2 were non-paralytic and 3 were paralytic. On the other hand, we were given information of 5 children who developed poliomyelitis during 1950 and were under the age of 6 months, but who were not included in Logan's figures. These 5 children had a paralytic attack. We have excluded the 5 children who were over 6 months of age and included the 5 referred to above. It is on this revised list of 82 cases that we are reporting the results of our investigation.

Logan's figures show that of the 82 cases that were notified in children under 6 months 72 were paralytic and 10 were non-paralytic. Our follow-up of the revised list of cases shows that 77 were paralytic (including the fatal cases) and 5 non-paralytic.

Our primary object was to consider: (1) the incidence of poliomyelitis in children under the age of 6 months; (2) its fatality, severity, and the extent of recovery; and (3) whether breast-feeding had any effect in preventing poliomyelitis.

Incidence

The incidence of poliomyelitis in children under 6 months of age was of particular interest to us in connexion with immunization against diphtheria, either alone or combined with a vaccine against whooping-cough; for Bousfield (1951) had suggested in 1951 that if children received their immunization earlier in infancy they would run less risk of contracting that type of paralytic poliomyelitis which is associated with immunization. It was assumed that this suggestion was based on the supposed infrequency of poliomyelitis in children under this age.

In children under 15 the total number of notifications of paralytic poliomyelitis in 1950 was 3,799. The number of children under 6 months per 1,000 children under 15 in 1950 was 35.8. The expected number of notifications in children under 6 months would therefore have been $35.8 \times 3,799 = 136$. There were in fact 77 cases according to our investigations.

In the same age group there were notified 1,525 cases of non-paralytic poliomyelitis. On the same basis the expected number in children under 6 months would have been 54.5. There were in fact, according to our investigations, 5.

It would appear, therefore, that the incidence of paralytic poliomyelitis in infants under 6 months was approximately 56.6% of what it would have been had it been evenly distributed in six-monthly age groups in children under the age of 15, and for non-paralytic poliomyelitis 9%.

In our opinion: (1) These facts, together with the severity of the disease in this age group (see later) would not have warranted the continuation of immunization in 1950 in children under 6 months in a district where there was an outbreak of poliomyelitis, solely on the grounds that the children were under 6 months old. (2) Non-paralytic poliomyelitis is not frequently notified in children under 6 months. This may be due to (a) the difficulty of diagnosis of non-paralytic poliomyelitis in children under 6 months; and (b) the possibility that lowered resistance to the poliomyelitis virus in this age group results in almost all cases developing paralysis.

Mortality

Of the 82 patients we investigated 19 died, giving a mortality rate of 23%. We have compared this with the mortality rate of poliomyelitis in 1950 in persons over the age of 6 months. During that year there were 7,668 notifications in this age group, and of these patients 715 died, giving a death rate of 9.3%. It is therefore apparent that in 1950 the mortality rate of poliomyelitis in children under 6 months was more than double that of persons over this age.

Table I shows the mortality rate in three separate age groups for children under 6 months of age. It also indicates that for poliomyelitis in 1950 the younger the children the greater was the mortality rate. Table II gives the age of onset and death of the 19 fatal cases.

TABLE I.—Fatality

	M	F	Total	Died	Survived	Mortality
0-9 weeks ..	14	10	24	9 (F 4, M 5)	15	37.5%
10-18 " ..	13	16	29	6 (F 3, M 3)	23	20.7%
19-26 " ..	19	7	26	4 (F 0, M 4)	22	15.4%

We have had to exclude three children whose exact age we were unable to ascertain.

TABLE II

	Age at Onset of Poliomyelitis	Age at Death
J. F. T. ..	8 days	10 days
L. E. G. ..	13 "	20 "
S. H. ..	2 weeks	18 "
B. O. ..	4 "	46 "
A. R. ..	5 "	6 weeks
P. H. ..	6 "	6 1/2 "
M. J. G. ..	7 "	9 "
C. G. B. ..	7 "	20 "
E. R. ..	8 "	8 "
U. J. ..	12 "	13 "
A. A. ..	12 "	12 "
J. S. ..	16 "	16 "
D. R. ..	16 "	16 "
J. P. ..	17 "	17 "
K. B. ..	18 "	18 1/2 "
T. G. ..	19 "	19 "
R. D. A. ..	22 "	22 1/2 "
K. G. C. ..	23 "	23 1/2 "
S. S. ..	23 "	23 "

These figures are an additional indication of the severity of paralytic poliomyelitis in the early weeks of life. It will be seen that in most cases death ensued within a question of days from the onset of the disease.

The mortality of poliomyelitis in young babies has been reported upon by Smallpeice and Ounsted (1952). They describe an outbreak of poliomyelitis in a nursing-home. The patients were infants aged 7, 3, and 2 weeks respectively. Two died and one is an epileptic idiot with palsies and athetosis. It is interesting to note that these authors

state that all forms of poliomyelitis are uncommon in early infancy, quoting Mouton, Smillie, and Bower (1950). This statement was not borne out in the 1950 epidemic in England. We have also information of an outbreak in a maternity home in 1952. Three newborn babies contracted poliomyelitis and two died.

We would refer to the report of an outbreak of poliomyelitis in Israel in 1951 (Health Services of Israel, 1952). Of 1,602 cases notified 30% were in children under 1 year of age. We have not yet received information concerning the actual ages of the children, nor the death rate in monthly or quarterly age groups.

Severity and Recovery

For the purposes of this review we have classified our cases as fatal, paralytic, and non-paralytic. Of the 82 cases, 19 were fatal, 58 paralytic, and 5 non-paralytic. We have classified the extent of paralysis in the paralytic cases as follows: A, three or more limbs or two limbs and one other part of the body affected. B, two limbs or one limb and one other part of the body affected. C, one limb affected. R, complete recovery.

Table III sets out the extent of paralysis in 55 of the 58 paralytic cases. In three cases we did not succeed in obtaining information about the initial extent of paralysis and the condition three years later.

TABLE III

Initial Paralysis		Condition 3 Years Later			
		A	B	C	R
A	18	8	6	3	1
B	12	—	4	7	1
C	25	—	—	16	9
Not known	3	—	—	—	—
Total	58	8	10	26	11

We have not been able to make a scientific comparison between the severity of the disease in children under 6 months and the severity at all ages in 1950, for we have no comparable figures. We can only draw attention to the fact that 19 children died and that 18 were very severely paralysed. On the other hand, dealing with the question of recovery, we would confirm our opinion, previously expressed, that in poliomyelitis recovery is to some extent proportionate to the initial severity of the paralysis of the affected limbs (Geffen, Paterson, and Tracy, 1953).

Breast-feeding

Dr. S. K. Sanders, in a personal communication, gave us some information concerning mouse encephalomyelitis virus, which behaves in some ways in the same manner as the poliomyelitis virus. Female mice which have a high degree of circulating antibody as a result of active immunization transfer this immunity to their offspring via the colostrum and milk. Suckling mice of such mothers are correspondingly more resistant to peripheral challenge with active virus than the offspring of mothers who have not been so immunized. This is also true of the Coxsackie virus.

It was with this in mind that we determined to inquire into (1) the history of the mothers of the 82 children, with a view to ascertaining if they had had any recent attack of poliomyelitis; and (2) the extent to which the 82 children were breast-fed.

(1) In 76 of the 82 cases we could obtain no history that the mother had at any time suffered a diagnosed attack of poliomyelitis. In the remaining six cases the mother and the child both developed poliomyelitis either simultaneously or within a few days of each other. Further details of these six cases are given below.

(2) Of the 19 children who died, 4 were being entirely breast-fed at the time of death; 8 had been breast-fed for varying periods; 4 had never been breast-fed; and in the

remaining 3 cases we could obtain no information. Of the children who survived, 15 were entirely breast-fed; 32 had been breast-fed for varying periods; 10 had never been breast-fed; of 6 we could get no history.

Thirteen children developed poliomyelitis under the age of 6 weeks—6 died and 7 survived. Of the 7 survivors, 5 were entirely breast-fed, and, of these, 3 had a mild attack (category C).

In the absence of a history of poliomyelitis in the mother, or knowledge of whether she had had an undiagnosed attack, we are unable to make any deductions of value from these figures.

The following are the details of the six cases in which the mother also had poliomyelitis.

Case 1. J. F. T.—The mother died of poliomyelitis six days after the baby was born. This baby died of poliomyelitis at the age of 10 days.

Case 2. R. H. H.—The mother died of poliomyelitis on the fifth day of the puerperium. The child developed poliomyelitis at the age of 10 days and had a very severe attack (category A).

Case 21. A. D. T.—The mother contracted an abortive attack of poliomyelitis at the same time as the child. The child—aged 9 weeks—contracted a serious attack of poliomyelitis (category A).

Case 33. O. H. G.—The mother contracted an abortive attack of poliomyelitis at the same time as the child. The child contracted poliomyelitis at the age of 13 weeks and had a serious attack.

Case 39. S. F.—The mother had a severe attack of poliomyelitis seven days before the child. The child contracted poliomyelitis at the age of 15 weeks and had a mild attack.

Case 51. A. B.—The mother had poliomyelitis two days before the baby. The child developed poliomyelitis at the age of 17 weeks and had a mild attack (category C).

History of Immunization or any Operative Procedure

We inquired in every case whether the child had been immunized or subjected to any operation. In view of the fact that all the children were under 6 months it is not surprising to find that only one of them had been immunized, and this was against whooping-cough. The injection was in the right arm, and took place six to eight weeks before admission to hospital. Paralysis was limited to the left leg.

Only one child had been vaccinated against smallpox. Vaccination took place at the age of 4 weeks, and the child contracted poliomyelitis at the age of 22 weeks. This case (R. D. A.) was fatal.

One child (B. O.) had an operation for pyloric stenosis on August 4. On August 14 the mother noticed that the child had difficulty in breathing. He was readmitted to hospital on the 17th and died on the 18th.

Pre-paralytic Symptoms

In view of the difficulty of diagnosis of poliomyelitis in infants, we have attempted to assess the importance of the pre-paralytic symptoms which have been recorded. Table IV sets out the position.

TABLE IV.—Pre-Paralytic Symptoms

Nil	11
Not known	9
Drowsiness alone or associated with other symptoms	15
Pyrexia, either alone or associated with other symptoms	21
Irritability	4
Abdominal symptoms such as loss of appetite, pain, diarrhoea, and vomiting	8
Other symptoms	11

We are of the opinion, judging from the above Table and from the reading of individual case sheets, that in this series there were no definite pre-paralytic symptoms diagnostic of poliomyelitis; they were rather symptoms of any acute infection in the first six months of life.

Summary

A report is presented of 82 cases of poliomyelitis in children under 6 months which occurred in England and Wales during 1950. Of the 82 cases, 77 were paralytic and 5 non-paralytic.

The incidence of paralytic poliomyelitis in infants under 6 months was 56.6% of what it would have been if such incidence had been equally distributed in six-monthly age groups in children under 15 years.

Non-paralytic poliomyelitis is infrequently diagnosed in children under 6 months.

The overall mortality rate was 23%, and this mortality increased as age diminished. In children under 9 weeks the mortality rate was 37.5%.

Of the 58 paralytic cases who survived, 30 were either very severely or severely paralysed, and of these only 2 made a complete recovery.

We have discussed the influence of breast feeding on the incidence and course of the disease.

The pre-paralytic symptoms were not diagnostic except of an acute infection in a child under 6 months.

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Medical Memoranda

Acute Strychnine Poisoning after a Massive Dose

Deaths from strychnine poisoning are not uncommon and have been exhaustively dealt with in the literature. The interest of the present case lies in (a) the enormous dose which must have been taken and the rapidity with which death occurred; (b) the little evidence of any of the classical symptoms of strychnine poisoning; and (c) the further evidence of the extreme rapidity of absorption of the drug from the alimentary canal.

CASE REPORT

The deceased was a pharmacist aged 56. At 10 o'clock one morning, having dispatched all but one of his assistants on various errands, he retired to a room over the shop. Eighteen minutes later he was found in this room by an assistant, lying on a couch with his head on the seat and his legs dangling over the raised end. Examination by a doctor five minutes later proved life to be extinct, and it seems probable that he was already dead at 10.18, when found by the assistant. There is good evidence, therefore, that death ensued at the most 15 minutes after swallowing the poison, and probably rather less. When the body was examined by the doctor there was no trace of any muscular rigidity. It is probable that if there had been any violent convulsions before death the man would not have remained on the couch but would have rolled off on the floor. Beside the body was found a partly filled bottle of solution of strychnine hydrochloride, and crystals of what later proved to be strychnine hydrochloride were found in the deceased's mouth, down the front of his pullover, and on the floor surrounding the body.

The necropsy findings were largely negative apart from rather meagre evidence of asphyxia.

The viscera were subjected to the classical Stas-Otto extraction. The residues from the chloroform-caustic-soda extraction were heated on a water bath for 30 minutes with concentrated sulphuric acid, diluted with water, filtered, made alkaline, and re-extracted with chloroform. Removal of the chloroform yielded a white, crystalline, weighable residue which was proved to be practically pure strychnine by melting-point determination and titration. This last was effected by dissolving the residue in 0.01N sulphuric acid and back-titrating with 0.01N caustic soda, using methyl orange as an indicator. From the titration figures the fol-

lowing amounts of strychnine hydrochloride were calculated to be in each organ: liver, 125 mg.; kidneys, 30 mg.; bowel, 4,608 mg.; stomach and contents, 653 mg.; blood, 4 mg. per 100 ml.; urine, trace.

If we assume a circulation volume of 5 litres the total amount of strychnine in this would be 200 mg. There is, therefore, a total recovery of about 5.6 g. (84 gr.) of strychnine from the main viscera. It was estimated that the deceased had consumed 12 fl. oz. (340 ml.) of solution of strychnine hydrochloride (containing about 53 gr. (3.4 g.) of strychnine hydrochloride), but the amount of crystalline strychnine hydrochloride taken was not known.

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Primary Carcinoma Simulating Empyema of the Gall-bladder

Primary carcinoma of the gall-bladder is the fifth or sixth in order of frequency of cancers of the alimentary system. It is found in from 1 to 2.6% of all gall-bladder operations, in 0.42% of all necropsies, and in 2.8% of all cases of malignant disease. These figures are given by Illingworth (1935), who studied 50 cases. Judd and Gray (1932), Lichtenstein and Tannenbaum (1940), Kirshbaum and Kozoll (1941), Vadheim, Gray, and Dockerty (1944), Benjamin (1948), and Sainburg and Garlock (1948), and other American surgeons have all reported numerous examples. The following two cases, however, seem remarkable enough to warrant publication.

CASE 1

A compositor aged 78 was admitted on July 5, 1949. He had been well until a fortnight before, when he noticed a dull aching pain between the shoulder-blades. This persisted for a week, when he visited his doctor, who found he was jaundiced. He then admitted that his urine had been dark in colour for about 10 days. On examination the liver was palpable two fingerbreadths below the costal margin and the gall-bladder was felt below it.

On July 14 the serum bilirubin was 22.4 mg. per 100 ml.; blood cholesterol, 380 mg. per 100 ml.; blood urea, 25 mg. per 100 ml.; thymol turbidity, 1 unit; colloidal gold, 0; alkaline phosphatase, 64 units; serum protein, 6.4% (albumin 2.9%, globulin 3.5%). On July 29 the abdomen was opened through a right paramedian incision. Several pints of ascitic fluid escaped. The liver was cirrhotic and the gall-bladder large and tense with a sugar-icing surface. The gall-bladder was opened and cheese-like material removed with a spoon. It was excised with difficulty and a T-tube was placed in the common bile-duct. The patient became drowsy after the operation, gradually weakened, and died on July 31, 26 days after admission. Biliary cirrhosis, thrombosis of the hepatic vessels with patchy necrosis, and some metastases in the liver were found at necropsy.

Pathology.—The gall-bladder was 9 cm. long and 5.5 cm. in diameter. It was completely filled with yellow cheese-like material. Microscopically, no normal mucosa was seen. The wall was infiltrated by an ill-differentiated adenocarcinoma, which was forming acini in some places and not in others. The nuclei were large and vesicular with prominent nucleoli. There was very little mucin production. The material in the lumen had the structure of necrotic tumour and contained some pyknotic nuclei.

CASE 2

A secretary aged 52 first attended as an out-patient on December 11, 1950, complaining of bouts of pain between the shoulder-blades and on the right side of the abdomen, with occasional pain on the left side. She had always had to be careful what food she ate, but had never been jaundiced. On examination she was seen to be of sallow

complexion. A swelling was felt below the ribs on the right side, and on January 3, 1951, a cholecystogram showed no filling of the gall-bladder. On February 5 the abdomen was opened by a right paramedian incision and a greatly enlarged gall-bladder presented. It was slightly inflamed, and the many adhesions were divided. Because of the size of the gall-bladder, a retrograde cholecystectomy was performed and the abdomen was closed with a drain. On February 20 the patient was discharged from hospital, having made an uneventful recovery. She was seen last on September 5 of that year, when she complained of occasional attacks of pain, but on examination nothing abnormal was found.

Pathology.—The gall-bladder weighed 460 g. and was 17.5 cm. long and 7 cm. in diameter. The surface in contact with the liver was 8.5 by 6 cm. Large veins coursed over its surface. It was filled with grey cheese-like material, which when washed away from the wall left a shaggy lining. There were 20 mixed faceted calculi; the largest, 1.5 cm. in diameter, was impacted in Hartmann's pouch. There was a thickening up to 0.5 cm. of the wall of the organ on the ventral surface 5 cm. from the fundus. Microscopically, the contents of the gall-bladder could be demonstrated as masses of necrotic cancer. A section of the thickened wall showed a columnar-cell papillary adenocarcinoma growing in long trabeculae in a fine stroma. The cells were producing a little mucus and had large dark-staining nuclei with frequent mitoses. The wall of the gall-bladder did not appear to be completely penetrated by tumour at any point, and a section of the cystic duct showed no neoplastic tissue.

DISCUSSION

In both these cases, following a short history of symptoms referable to the biliary tract, a laparotomy was performed, and a grossly enlarged gall-bladder filled with cheese-like material was removed. In neither case was a diagnosis made until microscopical examination revealed an adenocarcinoma growing into the lumen of the organ. The cheese-like material was necrotic cancer, and there was no evidence of infection. Illingworth (1935) observed that the papillary type of carcinoma might reach a considerable size, partly filling the gall-bladder. It was prone to haemorrhage and necrosis, and might be so soft as to be mistaken for inspissated pus. In the series of 48 cases examined by Cooper (1937) 12% had papillary tumours, and some of these distended the gall-bladder. Rhodes and Greenblatt (1937) describe obstruction of the cystic duct by tumour as a cause of distension of the gall-bladder, which may simulate an empyema, but they make no mention of the organ being filled with necrotic tumour. Vadheim, Gray, and Dockerty (1944) found that 26 of their 77 cases had gall-bladders distended to four times the normal size, but the largest carcinoma they encountered measured only 7 by 6 by 5 cm. It is interesting to note that in 17 of their cases the carcinoma was limited to the mucosa and submucosa without penetration of the muscularis.

It therefore appears that the two tumours described are very large examples of a type recorded by some authors, but by no means universally recognized. A grave error would be made if cholecystostomy were performed in such a case.

My thanks are due to Mr. Ralph Shackman and Mr. Rodney Smith for permission to publish the cases and to Professor T. Crawford for his assistance in preparing the paper.

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Reviews

A PHILOSOPHY OF LIFE

The Natural History of Infectious Disease. By Sir Macfarlane Burnet, M.D., F.R.S. Second edition. (Pp. 356. 22s. 6d.) Cambridge: The University Press. 1953.

In 1940 Sir Macfarlane Burnet gave us a work entitled *Biological Aspects of Infectious Diseases*. This volume is described as its second edition, yet since the original work was written so many advances have been made in attacking the problems of infectious disease that the book has not only been given a new title but has been practically rewritten. It is not too high praise to term Sir Macfarlane's excellent book a philosophy of life, for it is written as Aristotle himself might have described the discoveries of modern science, and it is impossible to improve upon the Greek approach to the study of natural phenomena.

Under biological considerations the ecological aspect of infectious diseases, so important in epidemiology, and the evolution of infection and disease are examined. The aggressors—bacteria, protozoa, and viruses—are described. The chapter on viruses crystallizes modern research on the subject. How real these formerly hypothetical organisms have become is demonstrated by the frontispiece to the book, which shows the brick-shaped granular forms of the vaccinia virus as revealed by the electron microscope. Discussing the origin of these foes of men, animals, and plants, the author says that most research workers prefer the theory that animal viruses are the diminished descendants of pathogenic bacteria or protozoa.

Next come the processes of defence. After recounting the normal defences against bacterial infections and the development of immunity after disease, its chemical basis, antibodies, and its wider significance, the author examines "what makes bacteria dangerous," and reminds us that, even to-day, probably more than half of all human deaths are due essentially to micro-organismal invasion. Except for certain abnormally fatal epidemics, the state of the host is more important in determining the outcome than is the virulence of the micro-organism. Hence the importance of healthy living and adequate nutrition. He then describes the natural history of infectious disease—how infections spread, the transfer of infection from one species to another—animal reservoirs, the general character of epidemics, the prevalence of infectious disease, endemic epidemics, age-incidence of infectious disease, immunity as an epidemiological factor, the general principles of controlling infectious disease, together with an account of the antibacterial drugs, which within the short space of a decade have shorn many deadly diseases of their terrors and paved the way for the eradication of others.

A section of the book is devoted to the study of certain important diseases—diphtheria, influenza, plague, cholera, malaria, and yellow fever. Finally, the grave problem of atomic warfare and the use of micro-biological weapons are discussed. The outlook is indeed gloomy if mankind is destined to destroy civilization through its scientific discoveries.

This is a book which should be read by doctors, men of science, health administrators, and politicians. It emphasizes the recent warning of Professor A. V. Hill that every scientific and medical discovery brings with it human problems to solve—moral, social, political, or aesthetic. Scientific and technical progress cannot alone solve the problems of humanity. "That belief is magic and magic of the unattractive sort that denies a place to the human spirit."

ARTHUR S. MACNALT, Y.

*Address delivered at the annual assembly of faculties of University College, London, on July 2, 1953.

FOUNDER OF THE RED CROSS

Man Born to Live: Life and Work of Henry Dunant, Founder of the Red Cross. By Ellen Hart. With preface by H.R.H. the Princess Royal, and an introduction by Paul Ruegger, President of the International Committee of the Red Cross. (Pp. 371. £1 2s. 6d.) London: Victor Gollancz. 1953.

Many, perhaps most, people do not know that Henry Dunant was the man chiefly responsible for the Red Cross movement and the Geneva Convention. The reason for this is that he was really not a strong or very admirable character. The story of his life is well and faithfully told in this book, which will attract many readers.

Henry Dunant was born in 1828 in Geneva and was a "mother's boy" to such an extent that the maternal influence "set him back and for the rest of his life he was lacking maturity in some of its aspects." In his youth he was an earnest evangelical Christian. He entered the service of a bank and willingly went to Algeria, where he thought he might combine business with evangelism. There he started a private business venture, left the bank, and tried to obtain influential support for his enterprise. He was a good talker and had a most persuasive manner. In attempting to obtain support from the Emperor Napoleon III he followed the latter to the battlefield of Solferino, where he was so moved by the horrible sights he saw that for a time he did good work in succouring the wounded. In 1862, under the influence of strong emotion, he wrote *Un Souvenir de Solferino*, in which he included views which were to lead to the formation of the Red Cross organization. He sent copies of this work to many influential people, including the crowned heads of Europe. The ideals set forth therein were supported by a committee formed in Geneva, and Dunant's personal and sometimes irresponsible efforts spread its influence, but his financial ruin, which involved many of his relatives and friends, compelled him to leave his native city. For many years he lived in comparative obscurity, but in later life his pioneer work was recognized and he obtained a Nobel award. He died at the age of 82.

There is no doubt that Dunant was a man inspired by high ideals and able to move others along humanitarian lines, but he worked "by instinct and emotion," and some of his projects were impractical if not hare-brained. He was an individualist who described himself as "the dupe of a burning imagination, of an over-impressionable temperament," and he seems to have been a poor man of business. Nevertheless he impressed a great humanitarian idea on those who held the reins of authority in Europe, and for this we must hold him in honour.

ZACHARY COPE.

DIABETES

Die Zuckerkrankheit: Diagnose, Klinik, Pathologie, und Therapie. By Professor Ernst Wiechmann. (Pp. 318. M. 28.50.) Munich: J. F. Lehmanns Verlag. 1953.

After a silence of many years three large books on diabetes have appeared in the German language in the last three years. This one by Professor Wiechmann is voluminous and comprehensive. His foreword states that he started to write it in 1929 and has been absorbed in the subject ever since. The effect of this is obvious, and he has not criticized and excluded sufficiently the older references he gives. He lists some 2,000 references, arranges them well in an addendum, but gives the reader no critical evaluation of their contents. Much of the later work he quotes disproves the validity of the earlier. Great historical thoroughness, but too much of it is out-dated and useless. And, as an author quoted, I am a little sad to find that the last edition of my book was produced in 1927 and not, as in fact, in 1951.

The author addresses his book to all students and doctors, and makes a true point in his preface. He points out that diabetes affects all branches of medicine and surgery in a

special way of its own—from eyes, liver, nervous system, to feet—and so it behoves all general doctors and specialists to know its widespread effects. This is so true that all should ponder it.

The book covers all these aspects very well. But it gives insufficient help in practice to any doctor who wants to know how to use insulin and its different types or how to treat diabetic coma. The recommendation to give glucose, fructose, and saline by rectum requires changing.

R. D. LAWRENCE.

NERVE-ROOT CYSTS

Sacral Nerve-Root Cysts: Another Cause of the Sciatic or Cauda Equina Syndrome. By Professor I. M. Tarlov, M.D. (Pp. 134; 65 figures. £2 7s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This short monograph by the professor of neurology and neurosurgery at the New York Medical College is of considerable interest. Some years ago he made a study of the histology of the filum terminale, and in the course of dissecting 30 cases he found perineural cysts of the posterior-sacral nerve roots and ganglia in five. These cysts, which arise at the junction of the dorsal root and ganglion, vary in size up to 3 cm. in diameter and may be multiple. They do not communicate with the subarachnoid space, and are disclosed only when the posterior sacral arch is removed. At first the author regarded these cysts as pathological curiosities without clinical importance, but in 1947, when operating on a patient with sciatica, the suspected protrusion of an intervertebral disk was not found. On removing part of the posterior arch of the sacrum a cyst was seen on the second sacral root, and after the cyst had been removed the patient was relieved of sciatic pain. Professor Tarlov has subsequently operated on three further patients in whom similar cysts were causing symptoms either of sciatic pain or of disturbance of function of the lower sacral roots, and he mentions in detail three patients treated by other surgeons.

The author gives an excellent illustrated account of the naked-eye and histological appearances of these perineural cysts and discusses their possible aetiology. As a clinical account and a guide to the best method of treatment, it must be regarded as a preliminary report owing to the small number of cases so far recognized. But the author has probably drawn attention to a condition of clinical importance, and the monograph is well worth the attention of anyone interested in sciatica and in disturbances of the cauda equina.

J. W. ALDREN TURNER.

THE MIND MADE EASY

Psychology Without Tears. By William O'Connor, L.M.S.S.A.(Lond.), D.P.M.(Lond.). (Pp. 220. 12s. 6d.) London: Rider and Co. 1953.

The lay public has in these days a great appetite for popular psychology in plays, lectures, and books. It delights in being made aware of how people think and how reassuringly commonplace are its own secret thoughts. Interest in the subject is no longer confined to the lunatic fringe of society and to those with pretensions to intellectualism. The conscious application of psychological knowledge and theory is considered a legitimate part of the conduct of life by the diplomat, the salesman, the seducer, or the schoolboy who wishes to extract a tip from a rich uncle. A good deal of sharp practice can, in fact, be rationalized in the name of psychology. One of its most important applications, on the other hand, is that a knowledge of mind can turn mere good will into informed kindness, and nowhere is this more important than at the bedside.

If psychology is to be learned without tears—and tears are here a symbol for the painful effort of concentrated thought—there can be no atmosphere more congenial than that of the dinner-table, and Dr. Connor's style has the easy flow of the man who has, by general consent, monopolized the conversation. A sententious opening and

evidence here and there of a moralizing tendency detract very little from a survey of those parts of the subject which are likely to be of interest to the mentally healthy and inquiring layman.

The approach is singularly free from the bias of any particular school of thought, and gives little encouragement to morbid introspection, and the patient who asks for a "book on psychology" will come to no harm if he reads this one. Other popular writers in this field might have chosen different aspects of the subject, might have been more profound, but would probably have been far less readable.

ALEXANDER KENNEDY.

THE OESOPHAGUS

The Esophagus and its Diseases. By Eddy D. Palmer. (Pp. 553; illustrations by Phyllis Anderson. £4 13s.) London: Cassell and Co. 1953.

This book of 553 pages describes first the anatomy and clinical physiology of the oesophagus, and then in the twenty-five following chapters covers all the common and uncommon groups of disorders or diseases of the oesophagus. Each chapter is followed by a lavish bibliography.

The book has a useful collection of references, but even so it is curiously incomplete. No one in Britain writing about hiatus hernia would omit Harrington's contributions from the U.S.A., and yet Allison's work, of similar scale and importance in this country, is not mentioned in the book. Similarly, in writing about atresia of the oesophagus, British writers would properly refer to Sweet and Swenson, yet corresponding work by Franklin in Britain has been overlooked.

It is difficult to believe that this book is representative of American views. Operations for anastomosing the stomach and oesophagus for achalasia have ceased to be done in Britain but are advocated in this book. Heller's operation is scarcely mentioned. Many patients with hiatus hernia derive much relief from raising their shoulders on pillows at night or by raising the head of the bed on blocks, but in this book we are merely told that "certain simple postural measures would be helpful if they did not interfere to an excessive extent with normal living." Throughout the book the reader is lost in a forest of references and his therapeutic route is dimly marked. It is curious that there should be no section on the investigation of oesophageal diseases by oesophagoscopy or radiology. The book will be of interest to those whose work brings them particularly into contact with this branch of medicine or surgery, but for the general physician or surgeon it is dangerously misleading and is not recommended.

F. AVERY JONES.

CONTACT LENSES

Contact Lens Routine Practice. By Norman Bier, F.B.O.A. (Hons.), F.A.A.O., D.Orth. Foreword by F. A. Williamson-Noble, F.R.C.S. (Pp. 188; 105 figures. £2 2s.) London: Butterworth Scientific Publications. 1953.

This is a short practical book on the theory and practice of contact lenses. This comparatively new form of optical correction is rapidly becoming popular, and, although it is probably true that the day of basic discoveries has now ended, new improvements in technique are constantly being suggested. Among these full-clearance perforated (or vented) lenses, sealed minimum-clearance lenses, and corneal lenses without the usual supporting rim resting on the sclera are fully discussed, and their advantages and disadvantages assessed in the light of the author's considerable experience. He unhesitatingly prefers perforated contact lenses in preference to the sealed types in all but exceptional cases, as, for example, marked conical cornea. He presents clearly the technicalities of the subject and gives much detailed and sound practical advice on fitting the lenses and on their wear and aftercare by patients. The illustrations are unusually clear and informative.

STEWART DUKE-ELDER.

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BACKWARD READERS

Illiteracy is a much more complicated subject than might be thought from the many confident statements made about it nowadays. Some figures particularly liable to misinterpretation have recently been issued by the Director of Army Education. They were in a survey of the numbers of "illiterate" and "sub-illiterate or backward" recruits among some 45,000 National Servicemen. The percentage of backward recruits is given as 23, though it ranges from 6% to 45% in different counties.

In the interpretation of such figures much depends on the criterion or test used to measure reading ability. Here the tests were arithmetical and verbal. The illiterates, who totalled 1.2%, were those who could not fill in the answers to a set of simple questions about personal particulars. If we defined illiteracy as inability to read aloud or as a person's inability to understand what he is reading, the results might differ. Again, people do not fall into distinct classes; rather there is a continuous gradation from superior to minimal educational attainment. Hence the proportions of backward or illiterate persons will depend on where an arbitrary line is drawn, and the Army's figure of 23% is meaningless without precise definition of the degree of backwardness to which it refers. The corresponding number below this borderline early in the war was about 15%, and it must be admitted that there has been a decline in educational standards over the war years which has not yet been made up. The figure of 1.2% illiterate also needs interpretation, though for a different reason. In general, Army recruits constitute a fairly representative sample of the young adult male population, but at the bottom an unspecified number are rejected at recruiting centres on medical or psychological grounds, and if these were included the proportion of illiterates would certainly be higher. Even so the results tend to confirm the careful survey published in 1950 by the Ministry of Education,¹ where it was shown that illiterate school-leavers and young

adults amounted to about 1% of their group. Illiteracy was, there defined as reading comprehension poorer than that of average 7-year-old children in 1938. The survey also showed that the proportions of backward readers (with a "reading age" less than 12 years by 1938 standards) were 30% among 15-year-olds and 17% among adults.

Many of the figures that the Army gave for different counties must be treated with great caution because the numbers are small, but at least some of the differences between larger groupings are significant. Thus Welsh counties show 32½% of "backwardness," Scottish ones only 19½%. The latter figure probably reflects the greater emphasis on mechanical drill in arithmetic at Scottish schools, while the former is obviously affected by the difficulties of Welsh-speaking recruits with an English-language test. There is apparently more backwardness in rural than in urban areas, for the most populous counties usually, though not always, get the best percentages. There are other difficulties, seldom recognized, in the interpretation of the figures which many education authorities are collecting in response to the present public outcry about illiteracy among school-leavers. Some, for example, use tests which are based either on 1918 or on 1948 standards, and these naturally give a more gratifying picture than tests based on 1938 standards. Again, the business man who complains of the illiteracy of his office-boys and typists has overlooked the change in occupational distributions during the past 30 to 40 years. Far more of the brightest and best-educated adolescents nowadays enter skilled engineering or administrative and professional services, and employers often have to go much further down the scale of intelligence than they used to do.

Though the question how much illiteracy there is in the population is impossible to answer, the serious fact is that the proportion of backward individuals in Britain (on any criterion) is greater than before the war. In other words, average educational standards have fallen. Explanations of this are highly controversial and difficult to prove or disprove. That there has been a general decline in national intelligence, as forecast by eugenic writers, is not borne out by the Scottish Council for Research in Education's investigations. Often the blame is cast on modern educational methods. Here, too, the only available scientific evidence is negative; children educated in good "progressive" schools reach as high attainments as those taught in more "orthodox" schools. But it may still be true that some so-called progressive methods are slipshod and ineffective. Even so,

¹ *Reading Ability*, Pamphlet No. 18.

Sir Cyril Burt has found that much the most frequent causes of educational backwardness are, first, lack of intelligence, secondly, unfavourable home circumstances, and, thirdly, emotional maladjustment, anxiety, and lack of confidence. Poor teaching methods or school organization are only occasionally prominent. It would seem that the main reasons for the decline were wartime upsets such as bombing and evacuation, large classes, frequent changes of staff, and unsettled home conditions. Several of these still exist. For example, because of the high birth rate just after the war, the schools must for another ten years take more pupils than they are fitted for. No one knows whether certain home factors may not be more important—for instance, a decline in parental responsibility or increases in cinema-going and radio-listening or viewing. There is still much ground to be regained before achieving even pre-war standards.

TRAUMATIC EPILEPSY

When the Military Hospital for Head Injuries at Oxford was started in the early part of the war one of its purposes was the collection of well-documented case histories for research purposes, and since the end of the war a Head Injury Advice Bureau has kept in touch with many of the patients. Ritchie Russell and Whitty have made use of this material in a study of traumatic epilepsy, of which the first two papers have been published.^{1,2}

Here they have considered only penetrating wounds of the brain. The occurrence of a single epileptic fit or focal attack put the case into the category of traumatic epilepsy, though some patients who had attacks about which too little was known were not classified as epileptic. Of 820 survivors of penetrating brain wounds, 43% have developed epilepsy within five years of the wound. Among the 464 patients who have not developed epilepsy, 61 have been followed up for less than five years, and the probability is that some of these men may also become epileptic in the future. It is well recognized that epilepsy may start later than five years after an injury. In Ashcroft's³ first war series fits started at a later date in 10% of the cases, and therefore the eventual incidence of post-traumatic epilepsy in the series is likely to be higher than 43%. However, in over half the cases fits are

infrequent and are not in themselves causing serious disability. Figures from the first war are similar. Ashcroft, using Ministry of Pensions records, found a 45% incidence in 129 cases, and in other series the figures have been 44% of 562 cases⁴ and 49.5% of 1,234 cases.⁵ It is disappointing to find much the same incidence in the two wars, for it was hoped that the earlier surgery practised in the last war, the better wound debridement, and the reduction of infection with less scarring as a consequence would diminish the incidence of this complication. But some severely wounded patients may have survived who might have died of their wounds in the first war. This comparable incidence of traumatic epilepsy is some evidence against the idea that an important cause of the epilepsy is progressive scarring in the brain. As the authors point out, the incidence is very similar to that of epilepsy occurring after a brain abscess (50%).⁶ Referring to what they call this one-to-one ratio between patients who do and do not develop epilepsy, they consider that it points to "a balance of two equally important factors which may swing towards or against epilepsy developing, according to which of the two factors is most damaged."

As in previous reports^{3,7} there is a higher incidence of epilepsy with wounds in the central part of the brain than with wounds towards the poles, but the authors have made the new observation that wounds within 5 cm. of the sagittal line have a statistically much lower incidence of traumatic epilepsy than wounds elsewhere in the brain.

The second paper is devoted to a study of focal motor and somatic sensory fits, including fits which start focally and become generalized later. These form by far the largest group of focal epilepsies in the series, and the observations are based on 85 cases. A number of interesting points have been brought out here. A fit starting with a sensory aura and then showing clonic movements is common, but it is very rare for the reverse spread from motor to sensory phenomena to occur. In only one patient were focal clonic movements followed by numbness, and in a few others by the uncommon epileptic phenomena of sensations of heat or of pain. It is also rare for one type of sensory aura to change to a different sensory aura.

From these two observations the authors suggest that the cortical cells concerned with sensation have easier anatomical access to the motor cortex than to post-central cells concerned with other types of sensation. Inhibitory epileptic attacks—and the authors suggest that numbness is the sensory counterpart of an inhibitory motor fit—tend to affect large

areas of the body than clonic motor or positive sensory attacks. This agrees with the experimental findings in monkeys that stimulation of suppressor areas tends to cause widespread rather than local motor inhibition. But there seems to be little evidence for the authors' suggestion that post-epileptic paralysis is due to involvement or release of some inhibitory mechanism rather than the more usually accepted view that it is an exhaustion phenomenon. One other observation is of importance. It is that clonic focal attacks are more frequent with small Rolandic wounds with a slight permanent sensory-motor deficit than with extensive wounds causing a severe hemiplegia. This undoubtedly supports the view that the cortex is specifically concerned with clonic movements.

These detailed clinical studies of the course of the epileptic fit in a series of cases where the extent of brain damage is fairly accurately known are of great value, especially when considered in relation to the results of electrical stimulation of the exposed human brain.⁸ Further reports on the more complicated fits with auras relating to the special senses, to speech, and to the body image will be awaited with interest, and of special importance will be the authors' final conclusions on the cause of traumatic epilepsy.

WORLD CONFERENCE ON EDUCATION

The First World Conference on Medical Education takes place in London next week. The British Medical Association is acting as host organization and will welcome to its Headquarters the many hundreds of visitors, from overseas as well as from Great Britain, who are meeting to exchange their diverse ideas and experience on undergraduate medical education—the main theme of the Conference. It is being held under the auspices of the World Medical Association, and the World Health Organization has lent a helping hand from an early stage; much support has also been received from the Council for International Organizations of the Medical Sciences and the International Association of Universities. Sir Lionel Whitby, the President, will be supported by Professor W. Melville Arnott as Deputy President, and, as Vice-Presidents, Professor A. Hurtado (Peru), Dr. Victor Johnson (U.S.A.), Sir Arcot L. Mudaliar (India), and Dr. A. Stampar (Yugoslavia), the last-named having taken the place of Professor René Sand, whose enforced absence through illness is much regretted.

The great variety of topics to be discussed at the Conference will make it of wide appeal to doctors, and it is hoped that as many as possible in this country will be able to take some time off, even if only

a day or so, to make their contribution to discussing what Sir Lionel Whitby describes as "the dominant problem facing the medical profession in the second half of the twentieth century"—the problem of medical education. He asks how, in an age of ever-increasing scientific advance and ever-increasing specialization of knowledge, we can best teach the young men and women who will be the doctors of the future. This is the challenge before the Conference. While no final answer can be expected, the great range of subjects to be debated and the participation of distinguished men from all over the world give promise that the first large-scale attack on the problem will carry far.

Registration takes place in the Registration Bureau of the Conference, Great Hall, B.M.A. House. The Bureau will be open between the following hours: Saturday, August 22, 11 a.m. to 4 p.m.; Sunday, August 23, 10 a.m. to 4 p.m.; Monday, August 24 onwards, 9 a.m. to 6 p.m. The registration fee will be £4 sterling, and concessionary fees are charged to those who take part for less than the full week.

METHYLPENTYNOL

A good many years have passed since a new kind of hypnotic has been discovered, and we have grown accustomed to the almost exclusive use of the barbiturates in one form or another. About two years ago Margolin and his colleagues¹ described the hypnotic properties of 3-methyl-pentyne-ol-3. The structure of this substance can be regarded as derived from that of methyl alcohol, CH_3OH , by substituting for the three hydrogen atoms (1) $-\text{C}_2\text{H}_5$, (2) $-\text{CH}_3$, and (3) $-\text{C}_2\text{H}_5$, respectively, the last substituent being the group remaining when one hydrogen atom is removed from acetylene, so that it can be written $-\text{C}\equiv\text{CH}$. Methylpentynol, as it is called (or methylparafynol), is unlike methyl alcohol in that it does not cause intoxication, but when administered to animals or man it sends them to sleep. It can be given by mouth. In addition it has the very important advantage that it is broken down in the body with fair speed. The safety of a hypnotic depends on the rate of its removal or breakdown, and when methylpentynol was given to dogs in amounts of 200 mg./kg. less than 5% was excreted during 24 hours, and none could be detected in the blood after two hours.

Hirsh and Orsinger² have studied the hypnotic action in 276 patients of ages from 20 to 83 suffering from various diseases, and found that when 500 mg. was given 93% fell asleep in one hour and slept for five hours or more. Only 5 out of the 276 noticed any after-effects.

¹ Science, 1951, 114, 384.

² Amer. Practit. (Philad.), 1952, 3, 23.

³ Malone, H. J., Klimkiewicz, G. R., and Gribetz, H. J., J. Pediat., 1952, 41, 153.

⁴ Chevally, J., et al., N.Y. St. J. Med., 1952, 52, 572.

⁵ J. Neurol. Neurosurg. Psychiat., 1952, 15, 93.
⁶ Ibid., 1953, 16, 73.
⁷ British Medical Journal, 1941, 1, 739.
⁸ Baumm, H., Z. ges. Neurol. Psychiat., 1930, 127, 279.
⁹ Credner, L., ibid., 1930, 128, 721.
¹⁰ Jooma, O. V., et al., J. Neurol. Neurosurg. Psychiat., 1951, 14, 308.
¹¹ Turner, W. A., J. Neurol. Psychopath., 1923, 3, 309.
¹² Penfield, W. G., and Krestiansen, K., Epileptic Seizure Patterns. Springfield, Illinois: Charles C. Thomas, 1951.

¹³ Allen, A. W., and Krongold, D. D., Quart. Bull. Sea View Hosp., 1951, 12, 61.

Several other clinical reports have been published^{3,4,5} in which similar results have been described. In all the clinical trials sleep was induced in a very high percentage of subjects, with no hangover on awakening and no nausea or other reactions. In one case the drug was taken daily for six months. Dogs and rats have been given amounts equivalent to 70 times the therapeutic dose, and no gross pathological changes were found and no abnormalities of the blood, of renal function, or of blood sugar. There appear to be no contraindications to the use of methylpentynol. It has been given safely to patients with hypertension, arteriosclerosis, portal cirrhosis, and diabetes. Children in hospital who experienced long periods of wakefulness and restlessness before sleep were able to sleep more quickly when given 150 mg. of methylpentynol, and were not drowsy when they awoke. In some cases sleep was permanently improved when the drug was given for a month and then stopped.

An overdose of methylpentynol causes deep sleep from which the subject can be roused by the injection of caffeine. The drug is said to have no depressant action on heart and respiration and no anaesthetic or analgesic action. For this reason it is less effective when sleeplessness is due to pain.

All the published accounts suggest that a useful new means of dealing with insomnia has been discovered. But a cautious attitude about the safety of methylpentynol must be maintained until it has been more widely used, for most new drugs pass through a phase in which they are esteemed too highly. A substance of this kind, related to alcohol, will almost certainly have depressant effects on the liver, on the heart, and on the respiration, even if these are slight, and no responsible person should suggest at this stage that it is completely harmless.

BIOLOGICAL SYNTHESIS OF VITAMIN C

An important advance in our knowledge of how plants make vitamin C has recently been achieved at Cambridge by Mapson and his colleagues. Vitamin C, or ascorbic acid, is closely related to the hexose sugars, of which glucose is the most familiar. But whereas glucose has a D configuration according to a scheme based on the structural formula rather than on the actual optical rotation, the natural form of ascorbic acid has an L configuration. In the manufacture of synthetic vitamin C, therefore, glucose cannot be used as the starting point. The chemist has to turn to sorbose, a less readily available hexose having an L configuration.

But twenty years ago Ray¹ showed clearly that the plant is less particular in its choice of starting material for synthesizing the vitamin. When excised pea embryos were nourished on media containing various sugars, glucose was found to be highly effective in increasing synthesis. Since ascorbic acid is formed by all plant

tissues, and not only in those rare instances in which L sugars predominate, Ray's observations were perhaps only to be expected. The subtle mechanisms of the plant cell can obviously induce structural changes in the hexose molecule in ways which cannot yet be imitated by the organic chemist.

Until recently we were not only unable to imitate the plant's mechanism, but had no reasonable theory about the sequence of the reactions leading to the production of the vitamin from glucose. Thus it was thought possible at one time that D-hexoses, such as glucose or galactose, might be split up into trioses, which could then be recombined in an L configuration. But experiments with the rat, an animal which resembles the plant in being able to synthesize ascorbic acid, failed to support this view. When glucose uniformly labelled with radioactive carbon atoms was administered, the ascorbic acid which was produced from it was also found to be uniformly labelled. This would be an improbable finding if the glucose molecule had been split in half, since most of the radioactive triose would presumably have recombined with non-radioactive trioses formed in the normal course of metabolism.

The evolution by Isherwood, Chen, and Mapson² of an alternative theory which seems completely to fit the facts must therefore be counted an outstanding scientific advance. These workers took their clue from the well-known observation that when animals are dosed with hypnotic drugs, such as chlorbutanol, the production of glucuronic acid, which is used for detoxication, is accompanied by a large increase in the production of ascorbic acid. Might this not mean that glucuronic acid is an intermediate step in the production of ascorbic acid from D-hexoses?

Intensive chemical studies in which various hexoses and derivatives of glucuronic acid were tested as sources of L-ascorbic acid confirmed this hypothesis, and gave an ingenious explanation of the reversal between the D and L configurations. Let us picture the glucose molecule as having a hydroxyl (reduced) group at one end and an aldehyde (oxidized) group at the other. Further oxidation of the aldehyde group to form the carboxyl group of glucuronic acid would leave the configuration in the D form, and attempts to synthesize ascorbic acid would inevitably end with the D isomer, which has very little biological activity. But if the oxidation to carboxyl occurs at the alcohol end of the molecule, and the aldehyde group is later reduced, the configuration of the molecule is effectively turned upside down. Processes directed towards the formation of the ascorbic acid must now produce the natural L variety.

According to Isherwood, Chen, and Mapson the steps along the route of synthesis in the plant or animal are D-glucose, D-glucurono-γ-lactone, L-gulonono-γ-lactone and L-ascorbic acid. With galactose the corresponding steps are D-galactose, D-galacturonic methyl ester, L-galactono-γ-lactone, and L-ascorbic acid. L-Galactono-γ-lactone is more efficient than L-gulonono-γ-lactone in promoting the synthesis of ascorbic acid in plants, but both are equally effective in animals. Experiments of

the synthesis of vitamin C by enzyme systems *in vitro* are proceeding, and successful preliminary experiments are, we understand, soon to be published.³ The enzyme necessary for the conversion of the γ-lactone to ascorbic acid is present in the mitochondria of plant cells.

MORPHINE AND ALCOHOL

A few weeks ago we discussed the synergistic action of alcohol and barbiturates taken together, and suggested that drivers of cars would be very unwise to mix their drugs in this way.¹ Two recent papers from Professor K. O. Moeller,^{2,3} of Copenhagen, contain some details about the effects of morphine on patients who had fairly high concentrations of alcohol in their blood, and he reports seven deaths. The alcohol concentration in the blood of these patients was from 0.18 to 0.27%, far lower than the amount usually regarded as lethal (0.4 to 0.5%). One patient was a woman with cholelithiasis. She was strongly addicted to alcohol, and had already consumed a large quantity when she went to her doctor for an injection to relieve her pain. As he was not at home at the time she persuaded the doctor's wife to give her an injection of 20 mg. (½ gr.) of morphine. Two hours later the patient was found unconscious at home and she died shortly afterwards. At necropsy gall-stones were found in the gall-bladder, morphine in the liver and urine, and alcohol in the blood in a concentration of 0.2%. In a second fatal case morphine was given for biliary colic and in a third for renal colic (stones were present in both). In the remaining four cases morphine or morphine and scopolamine was given to quieten restless or violent alcoholics—the dose of morphine varying from 15 mg. (¼ gr.) to 26 mg. (½ gr.)—and in addition two of the patients were also given an intravenous injection of a barbiturate compound. All died from one and a half to five hours after the administration of morphine. In healthy individuals the lethal dose of morphine is as high as 100 mg. (1½ gr.) by subcutaneous injection, and, since the concentration of alcohol in the blood of all these patients did not approach the lethal amount, Moeller concludes that morphine acts synergistically with alcohol. Thus the administration of morphine to patients under the influence of alcohol may have serious consequences.

CARE OF AGED IN SCOTLAND

The study of how best to care for old people is in no danger of becoming one of the neglected backwaters of medicine. Now a new report⁴ from Scotland adds some sound and kindly advice on what is already a considerable problem. Between 1921 and 1947 the number of people of pensionable age in Scotland rose from 377,000 to 629,000. By 1969 they are expected to number 858,000, or 15.5% of the population, as compared with 7.7% in 1921. The proportion of elderly people varies in different areas, in 1947 ranging from 25% in the north to 10% in the Lanarkshire burghs. This is no doubt one of the consequences of industrialization, for the young

men are tempted to seek their living near the city lights. The old people are left behind, and families are neither large enough nowadays to care for the elderly members easily nor so dutiful as to make the often considerable sacrifice that was expected in former times.

The ideal that this report advocates is "to have healthy people living their own lives in their own homes, and to postpone senescence as long as possible." Much can be done, the report adds, and perhaps the most pressing of the needs whose fulfilment it advocates is the provision of suitable houses and, where necessary, domestic help. In the long run this is probably of much more importance to the wellbeing of the old than anything the health services can offer, and it is a matter for regret that the authors of the report found a "great lack of information and knowledge" here. They were right to point out also—though without the emphasis it deserves—that a happy old age is something that must be prepared for. It is not so much a question of cheap tobacco and Windsor chairs and T.V. sets as the consequence of a youth ill or well spent. Whether the Welfare State, in partly relieving many people of the need to save up for old age, will also diminish their capacity to prepare mentally for it is a matter for speculation. But at any rate the report does make the point that old people's interests must be kept up, hobbies encouraged, and loneliness dispelled.

For people who cannot, even with help, manage their own lives, some kind of hostel care is necessary—and much more of it than exists at present. The committee finds that about 10,000 places are available but that at least 17,000 are needed. Nor is their provision a matter only of affording the most suitable accommodation: the scarcity of hostel places is uneconomic, for 35 old people in a hostel can be looked after by a staff of 7 or 8, in a general hospital by about 20, in a long-stay annexe by 13 or 14, and in their own homes by about 12 full-time home helps. There are clearly strong arguments here for including more hostels in the current building programmes.

The report is rightly emphatic about the need to restrict hospital admissions of elderly people to those who require investigations or treatment best undertaken in hospital. And the corollary is no less important—namely, that the patient should be discharged when the investigation or treatment comes to an end. Unfortunately many circumstances compel hospitals to depart from these ideals, one of the commonest being that there is no home to which the patient can be discharged. While this again is a problem that is perhaps more social than strictly medical, the report has some valuable suggestions on the part that efficient aftercare services could play in helping the old person get back to health outside hospital. But until long-term measures get going the elderly are bound to make considerable demands on hospital beds, and all who have the care of them will especially welcome the committee's plea for more field research into the best means of helping them.

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² Isherwood, F. A., Chen, Y. T., and Mapson, L. W., *Nature (Lond.)*, 1953, 171, 348.

³ Mapson, L. W., *Proc. Nutr. Soc.*, in the press.

⁴ *British Medical Journal*, 1953, 1, 1269.

⁵ *T. norske Laegeforen.*, 1953, 73, 1.

⁶ *Ugeskr. Laeg.*, 1952, 114, 1785.

⁷ *The Ageing Population*. Department of Health for Scotland. H.M.S.O., 6d. Prepared by a subcommittee of the Standing Medical Advisory Committee. Members: Dr. W. G. Clark (chairman), Dr. A. D. Briggs, Dr. Mary Eastmont, and Professor I. G. W. Hill.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

SUBACUTE BACTERIAL ENDOCARDITIS

BY

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The effective use of antibiotics has not only changed the prognosis and clinical course of subacute bacterial endocarditis but has entirely altered the emphasis on early diagnosis. Ten years ago the diagnosis was seldom made until the disease was well established, while today any patient with a heart murmur and unexplained fever should be suspect. In my own wards patients suffering from rheumatic fever, cystitis, glandular fever, virus pneumonia, carcinoma of the stomach, periarteritis nodosa, haemolytic anaemia, and perianal abscess have been admitted with the diagnosis of subacute bacterial endocarditis, and in each case, although the initial diagnosis was shown to be wrong, the admission of the patient to hospital should be taken as evidence of good judgment and efficiency on the part of the general practitioner involved. Early diagnosis is of great importance to the patient, therefore a full investigation is indicated when subacute bacterial endocarditis is first suspected.

Early Diagnosis

It is unfortunate that the early clinical manifestations are not only variable but often vague and ill defined. Fever is probably the most reliable early sign, but the degree of malaise with which it is associated is often so slight that it may pass unnoticed. The first complaint is usually of fatigue, loss of appetite, and sometimes pains in the joints. The patient may feel chilly and slightly feverish, and the temperature is found to be raised. If the patient is examined at this stage some of the physical signs of the disease such as splenic enlargement, petechiae, or embolic phenomena may be found, but often these are absent and the diagnosis can be established only by blood culture. Less frequently the disease remains unsuspected until the sudden onset of rigors and fever or of embolism and infarction.

Early diagnosis is now important, since delay in treatment undoubtedly diminishes the chances of survival, not because the infection is less readily controlled but because damage to the heart is both progressive and dangerous. Any patient with valvular or congenital heart disease who has unexplained fever should be suspect, and it follows that in the differential diagnosis all conditions which give rise to prolonged fever have to be considered, particularly those associated with splenic enlargement. Urinary infection is a common source of error, and tuberculosis and typhoid, glandular, and other fevers may have to be excluded.

The most difficult disease to distinguish from subacute bacterial endocarditis is rheumatic fever, a difficulty which was emphasized by Horder over 40 years ago. "It is probable that all the symptoms and signs of infective endocarditis may be met with in rheumatic fever, save the isolation of micro-organisms from the blood. Recurring attacks of subacute rheumatism in patients who have previously developed valvular disease often give rise to considerable anxiety on account of the similarity which they bear to the symptoms of infection of the endocardium." It is now much more important than it was to distinguish between these two diseases, but unfortunately there has been no corresponding improvement in diagnostic methods during the past 40 years. Even if blood cultures are repeatedly negative the diagnosis may remain in doubt, and therapeutic tests, first with salicylates and then with penicillin, may

have to be resorted to. The response to cortisone should never be used as a guide, since this may be disastrous in patients with subacute bacterial endocarditis.

Treatment

A unique feature of this disease is its resistance to treatment, although the infecting organism, which is usually a streptococcus viridans, may be sensitive to penicillin and to a variety of other chemotherapeutic agents. Large doses of penicillin are now recommended, and, although accurate figures are not yet available, it seems probable that the infection can be controlled in 95% or more of the cases. When the organism is not more than twice as resistant to penicillin as the standard Oxford staphylococcus, 2,000,000 units a day for four to six weeks will almost always be effective. In about 10% of cases the resistance of the organism is approximately four times that of the Oxford staphylococcus, and in these the daily dose should be increased to about 4,000,000 units. In about 5% of cases the resistance of the organism is more than eight times that of the Oxford staphylococcus, and under these circumstances the system of dosage to be adopted should be decided only after careful consideration of each individual case.

It is with this group of patients that disappointing results have been obtained. Information is as yet inadequate on the system of dosage which should be adopted in the treatment of these resistant cases, but in general it is true that the best results are obtained when the daily dose, if given by continuous infusion, would maintain a concentration in the blood which is about 50 or 100 times as great as the concentration required to kill cultures of the organism. In some patients very large amounts of penicillin may be sufficient, either when given alone or when given with some substance such as probenidol which delays the excretion of penicillin. As much as 40,000,000 units a day may be required, but when this degree of resistance is encountered the use of other antibiotics should always be considered, and it is in making this selection that mistakes are often made.

When antibiotics other than penicillin are used it should be borne in mind that bacteriostatic agents such as aureomycin and terramycin are seldom effective even when laboratory investigations indicate that the organism is highly sensitive. The practice of giving aureomycin because the laboratory report seems favourable and because the patient does not appear to be responding to penicillin should be condemned, since it seldom succeeds and usually only leads to delay in effective treatment. A more profitable line of approach is a combination of penicillin with streptomycin, which is also bactericidal, but it should be emphasized that combined antibiotics should be used only under close laboratory supervision. The interaction of antibiotics is a matter of great complexity, and the laboratory supervision of cases which are resistant to treatment with penicillin demands a high degree of skill and specialized knowledge.

For obvious reasons the patient should be confined to bed and the general principles involved in the treatment of any prolonged febrile illness should be applied. Anaemia should be given treatment appropriate to its severity, and it is important that an adequate state of nutrition should be maintained. Foci of infection should be searched for, and dental sepsis should if possible be eradicated while the patient is being treated with penicillin.

Response to Treatment.—The blood culture usually becomes sterile within a few days of the beginning of

treatment, but not infrequently fever persists longer, although it usually falls within a week. The danger of infarction and other embolic phenomena remains throughout treatment and convalescence, but in lessening degree. The spleen diminishes in size, often quite rapidly. In contrast, haematuria may persist long into convalescence. The erythrocyte sedimentation rate may remain high during treatment, but falls slowly during convalescence. In the absence of complications such as heart failure or major emboli it is usual to allow patients to sit in a chair for a week after the cessation of treatment, and then to encourage an increase in activity according to the patient's capacity.

Relapses, Prophylaxis, and Prognosis

Relapses.—These seldom occur more than a month after treatment, but a slight risk, amounting to about 2% of patients per annum, of relapse or reinfection remains. The treatment of patients who fail to respond to the usual dosage presents a special and difficult problem. A larger dose should be given, probably at least 5,000,000 units a day for a period of six to eight weeks, but, as already emphasized, the system of dosage should be carefully regulated according to the sensitivity of the infecting organism.

Prophylaxis.—Dental extraction and removal of other foci of infection have long been regarded as precipitating factors in this disease. In patients with rheumatic endocarditis or congenital heart disease a prophylactic course of penicillin for these minor operations should be insisted upon. A dosage of 500,000 units daily for three days is usually recommended, the first dose being given an hour or two before the operation. It is perhaps not generally realized that this system of dosage, which is the one generally used in prophylaxis, is based not on clinical trials but on an intelligent guess made many years ago when penicillin was in short supply.

Prognosis.—Death from heart failure is now a much greater hazard to the patient than the risk of failure to respond to penicillin. About a third of the patients who are apparently cured die in heart failure within two years of treatment with penicillin, and the outlook is particularly gloomy in those who have evidence of heart failure when treatment is started. If heart failure is severe the patient rarely survives more than a few months, and even if it is slight the chances against survival for more than two years are about four to one. Other adverse factors in prognosis are delay in treatment and relative insensitivity of the infecting organism to penicillin.

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

Nova et Vetera

THE DISCOVERY OF INSULIN

The Nobel Prize was awarded in 1923 to Banting and Macleod "for the discovery of insulin." Macleod's contribution to this dramatic discovery has been for long disputed. It is widely thought to have been both considerable and direct, and nearly 20 years later, in 1941, the *British Medical Journal* obituary notice on Sir Frederick Banting referred to "experiments in collaboration with the late Professor J. J. R. Macleod and Dr. C. H. Best which led to the discovery of insulin." Macleod's close participation in the research would not have been surprising, for the absorbing interest of his academic life was the metabolism of carbohydrates. His first papers on experimental glycosuria were published in 1905, and a series of 12 papers under the general title of "Studies in Experimental Glycosuria" was published in the *American Journal of Physiology* between

1907 and 1917 in addition to a series of 18 papers between 1908 and 1921 dealing with other aspects of carbohydrate metabolism.

Yet his inclusion in the Nobel Prize award led to bitter criticism of the prize-jury's decision. It was alleged that Macleod had been away from Toronto when the decisive experiment was made, and that, although he had put the facilities of his laboratory at Banting's disposal, he had had no part either in the formulation of the hypothesis on which the discovery was based or in any of the experimental investigations by which insulin was isolated and evaluated as a therapeutic agent. Best, who was Banting's close and acknowledged collaborator, was not given a share in the honour. According to Göran Liljestrand (1951), Banting expressed his dissatisfaction by sharing his half of the prize with Best, whereupon Macleod gave a corresponding part of his to J. B. Collip, who had participated with him in the purification and standardization of insulin.

Some Simple Facts

Nearly 30 years after the event we can now read Best's version (1952) of the early days, given as his corrective to "a few interesting statements about the early development of insulin which I completely fail to recognize." In the Banting Memorial Lecture for 1952 he writes:

"The facts are simple and straightforward. The young surgeon formulated an hypothesis which was vital to his initiation of the work and it thus completely fulfilled its function. He obtained permission to explore this hypothesis in the Physiological Laboratory of his Alma Mater and he received some excellent general advice from the Head of the Department. The second working hypothesis was that an internal secretion of the pancreas existed and that it could be captured. This one Banting and I shared, and in its exploration we invested our time and energy. We formed a partnership which was based on the new knowledge and experience which we gained together. We had no stipends, but the facilities of Professor Macleod's deserted department were at our disposal. We worked completely alone during the four summer months of 1921 without any verbal or written advice from any senior investigator and until well after the salient facts, consistent dramatic lowering of blood and urinary sugars and complete recovery of our moribund depancreatized dogs, had been repeatedly demonstrated." (There are no italics in the original.)

"Banting and I presented our work to the Medical Faculty at a departmental seminar in the autumn of 1921, and our findings were later published in two papers under our names in the *Journal of Laboratory and Clinical Medicine*. These papers give the first detailed account of our isolation of insulin. We were given an impression that a member's name was necessary for the acceptance of a paper to be read at the meeting of the American Physiological Society, and for this reason Professor Macleod's was added to the preliminary paper presented in December, 1921. Banting and I always hoped that our article on 'The Internal Secretion of the Pancreas,' which appeared in the February, 1922, issue of the *Journal of Laboratory and Clinical Medicine* and which we wrote for and presented to our Medical Faculty on November 14, 1921, would be universally accepted for what it in fact was, the original record of our work. The paper which bore, in addition, the name of the Head of the Department was a summary of the longer one. We prepared it later, but it appeared in print first."

Another commonly held misconception is also dispelled by Best—namely, that he was a medical student when he volunteered to work with Banting. He was, in fact, after five years of university study (and a year in the Canadian Army) a very recent graduate in the arts course of physiology and biochemistry. For family reasons he was particularly interested in diabetes and had been a part-time research worker on this subject and a demonstrator in physiology to medical students during 1920–1. He registered for an M.A. in physiology during the year that he and Banting worked together and was admitted to the degree in June, 1922. It was not until September, 1922, 16 months after the joint work on insulin had begun, that he decided to proceed to an M.D. and registered as a medical student in the University of Toronto.

HENRY COHEN.

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Correspondence

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

The Pain of Transurethral Manipulations

SIR,—As a general practitioner I cannot listen unmoved to my patients' accounts of how they have suffered during their in-patient treatment for genito-urinary complaints. During the past few years one after the other has told me of the agony he has suffered during cystoscopy and urethral catheterization, and particularly during such transurethral manipulations as are required to treat the complications of prostatectomy whichever route is employed. It appears that some attempt is made at anaesthetizing the urethral mucosa with a surface anaesthetic, but the pre-operative injections do little to support them during the ensuing ordeal.

These men tell me that they have endured as much as they can bear, and in two cases, where repeated manipulations were required for treatment of neoplasm, the patients discharged themselves because they were not brave enough to endure any more. These patients were not neurotics, and I hear no complaints from those who have undergone other forms of surgical treatment. Nor have all these patients attended the same hospital, but four different centres, so I assume that the technique differs little from place to place.

Are anaesthetists so few that none can be spared for "minor" genito-urinary sessions? Or do surgeons hesitate to employ them for "minor" procedures because the complexity of modern anaesthetics tends to reduce the operations to a mere incident in the induction of the anaesthesia? At all events it seems that the demon pain has been evicted from nearly every corner of surgery except from the cystoscopy and other things which are pushed up the male urethra. I am aware that genito-urinary surgeons are not by nature callous, but by long practice they have come to countenance the patients' reactions to urethral instrumentation as routine. The consolation that "it will soon be over" and "it has got to be done" does little to dull the pain of a large-size operating cystoscope turning through 360 degrees in the urethra—likewise the bladder washout via the urethra to control post-operative haemorrhage—for by then the spark of human vitality has grown very dim and the patient has literally reached the limit of endurance.—I am, etc.,

Sheffield.

E. C. ATKINSON.

Comfort in Callipers

SIR,—Dr. H. L. Rogerson (*Journal*, August 8, p. 337) has, I am afraid, done nothing to improve the design of the walking-calliper. What he has produced is not a calliper but a walking-splint for the lower extremity, the design of which is rooted in greater antiquity than the "antiquated calliper" about which he complains. This is not to say that his appliance is not an excellent one for his own particular case and illustrates the virtues of what one may call bespoke craftsmanship. The appliance is an expensive one to make, and, though it may stand up to Dr. Rogerson's personal needs, would not be suitable for everyday use by the majority of patients. For nine out of ten cases of poliomyelitis with the amount of paresis which he described (especially those who are young, active, and often heavy) it would be mechanically unsound.

The principle of the long outside iron fitted to a pelvic band was in use in the early nineteenth century. It was discussed and discarded by H. O. Thomas for the purposes for which he designed the calliper. The self-locking and quick-release knee hinge, the posteriorly placed knee hinge, and the eccentric articulation are all well known to surgical appliance makers; there is nothing new in that. The use of "duralumin" is of dubious advantage, for it has not, size

for size, the strength of steel, it cannot readily be forged, and in jointed parts the friction surfaces must be faced with steel. A well-forged steel appliance is little, if any, heavier than duralumin and is stronger. Certainly at the hip the need for strength is very great.

From hard experience one must say that in splint design "there is nothing new under the sun." Dr. Rogerson has, however, emphasized the need to provide long-term appliances for poliomyelitis which are made by individual craftsmanship for the particular problem. Mass production cannot solve this problem.—I am, etc.,

Exeter.

NORMAN CAPENER.

Fog Control in the Home

SIR,—In view of the great increase in sickness and deaths from pulmonary disorders attributable to the poisonous composition and long duration of the London fog of December 5-9, 1952, and the possible recurrence of that disaster, it is essential that any valuable lessons to be learnt from that experience should not be lost sight of.

In this connexion I beg to draw attention to certain ready and practicable measures which the householder can take to prevent the gross penetration of fog into living-rooms and bedrooms, as illustrated by the case of a lady aged about 75 living in London, who invariably suffers from bronchitis during the winter. Some years ago she had the open fireplace in her bedroom sealed off and used an electric radiator for heating the room. Normally she keeps the windows open, but during the intense fog of December, 1952, they were closed and the room, in which she was confined to bed, was practically free from fog during the worst period. I think she owes her survival to this fact.

Based on this experience, I do feel that in the event of a recurrence of dense fog the following action should be taken in houses supplied with electricity. No open fires or gas fires should be lit in living-rooms or bedrooms, as the room air passing up the chimney causes fog-laden air to be drawn into the room from outside. Windows should be kept closed and fireplaces or chimney flues sealed off, as an open flue causes a good deal of ventilation even though the fire is not lit. Electric radiators should be used if heating is required in the room, but less heat will be needed, as the ventilation is reduced. Provided flueless gas heaters are not used in small rooms, it might be desirable for air-bricks to be sealed up during the fog and to reopen them and unseal the fireplaces in other rooms as soon as the fog has abated.

If prompt action is taken to carry out the above recommendations, not only will the gross penetration of fog into rooms be prevented but its entry into the house as a whole will be lessened. These measures are calculated to be of particular benefit to persons with respiratory disabilities whose distress is aggravated by breathing fog-laden air.

Finally, Sir, it may be worth while recalling that the A.R.P. sealing of rooms to prevent the entry of poisonous gas was carried out by countless householders in the early days of the war. It would be gratifying if that experience finds application in ordinary times pending the hoped-for solution of the difficult problem of atmospheric pollution.—I am, etc.,

London, W.C.1.

GUY P. CROWDEN.

Chronic Bronchitis

SIR,—The annotation under the above heading (*Journal*, August 1, p. 268) is very timely. It points out the extreme gravity of the condition and draws attention to the economic loss we suffer from a too facile attitude to coughing. I believe we shall not progress in prevention of this and other chest diseases until we regard a persistent cough as seriously as persistent vomiting. The two symptoms have similar causes, infection and local irritation being the most prominent. In 1950, the last year for which figures are available, 16,500,000 working days were lost in England and Wales from bronchitis. Your contributors are too pessimistic when they conclude that a logically planned attack is not yet possible. Most of the factors are known—they are: (a) recurrent infection related particularly to overcrowding at home, at school, and at work; (b) atmospheric

pollution; (c) inhalation of dust and fumes at work; and (d) smoking, especially cigarettes.

As a profession we can do much more about each of these problems than we do at present. Our views on the lives of people in overcrowded areas have not been expressed sufficiently forcibly. In the Gorbals district of Glasgow 296 people live on each acre of ground. Cattle could not exist in such numbers. The incidence of tuberculosis and respiratory disease is closely related to this factor. The conditions in many urban and rural schools prevent children remaining well. Those responsible for the health of school-children should press for more healthy provision for scholars. Early and continued attention should be given to each attack of respiratory infection, and more seaside and country convalescent homes should be available for use by the general practitioner. It is absurd that a patient must be referred to hospital before convalescence can be arranged.

The overwhelming importance of atmospheric pollution in relation to respiratory disease was demonstrated by the great London fog of December, 1952. 6,000 people died as the direct result of this, while hundreds of thousands had their bronchitis exacerbated and their lives shortened. At the same time some of the finest cattle from the countryside were unable to live in our vitiated air and died of bronchitis and acute emphysema during a cattle show. No more scientifically controlled experiment could have been devised and yet it seems that little will be done. Eight months after the event a committee is set up by the Government to study the problem. In the past this has so frequently been a device for ensuring no action was taken that one fears this may be intended again. As a profession I think we should be active in smoke abatement both at home and nationally. Life could be much more pleasant and healthier, despite our damp climate. The conditions in factory, foundry, and mine leave much to be desired in most areas. Chronic pulmonary cripples are being produced each year by needless dust and fumes. The workers of the country must breathe pure air.

Finally, the harm done by smoking must be appreciated. No person who has smoked cigarettes for 20 years or more fails to cough—and many cough persistently each morning. Few will admit this because of a desire to continue the addiction. In practice more than 80% of bronchitics are heavy smokers. We should set them an example by not smoking ourselves and then assure them that unless they give up smoking no adequate relief from coughing can be expected.

The air we breathe is as important as the water we drink. It must be uninfected and unpolluted. A sanitary revolution commencing 100 years ago has done much to eliminate water-borne disease. We should work for the elimination of bronchitis and other air-borne diseases.—I am, etc.,

London, N.W.10.

H. JOULES.

Breast-feeding in Oxford

SIR,—I was very interested in the paper by Drs. Alice Stewart and Celia Westropp on breast-feeding (*Journal*, August 8, p. 305). I feel, however, although I am in no sense a statistician, that the conclusions are fallacious. The following are some of the criticisms which seem to me to invalidate the conclusions.

The children studied were selected. The writers state that "the enrolment procedure effectively excluded babies who were seriously ill at or before this age (2 months)." What proportion of the babies excluded were breast-fed at 2 months? It is very likely that a large proportion were bottle-fed. In that case an unduly large proportion of babies who had been ill would be excluded from the artificially fed group, and so the entire results would be invalidated.

There is no mention as to how and by whom the various observations were made. Were all the babies examined by the same person, and did that person know to which group the babies belonged? If she did, the element of bias was not eliminated. This might well be important, for several of the features studied were matters of opinion and interpretation. How, for instance, was the "closure of the fontanelle" assessed? If it was assessed by palpation, then it was a matter of opinion whether it was closed or not. Bias might well affect that opinion.

The writers say that "at the age of 1 year the babies who were bottle-fed from the beginning . . . showed signs of being slightly more mature." I can find no evidence for that statement. It is not clear what is meant by "more mature," but, if it refers to the radiological data, the "closure of the fontanelle," and the "crawling and walking," then I cannot see how that conclusion was reached. They give figures for the appearance of the distal radial epiphysis: unless my deductions from their

Table are incorrect, 61% of those weaned at or after the fourth month had the distal radial epiphysis, as compared with exactly the same proportion, 61%, of those weaned earlier. Their Table shows that there were exactly the same number of carpal bones (2.24) per radiograph per child in the two feeding groups, group 1 (babies weaned in the first month) and group 4 (weaned after the fifth month). As for the closure of the fontanelle, the differences between the various groups are not statistically significant (unless my mathematics are wrong), neither is there even a constant trend in the Table: for 41.7% of those in group 2 (babies weaned in the second or third months) and 31.1% in group 3 had a "closed fontanelle" at 12 months as compared with 30.3% in group 1 (those weaned in the first month).

As for the "milestones," walking and crawling, unfortunately these are not defined. Does "walking" mean walking with two hands held, one hand held, or without support? And was it assessed by the mother or doctor? However, taking the figures as they are given, once more there is no evidence to support the statements made: 63% of the babies in groups 3 and 4 were crawling at 10 months, as compared with 64% in groups 1 and 2; 71.7% of those in group 3 were crawling at 10 months, as compared with 61.8% of those in group 1. As for "walking," the difference between groups 1 and 4 is not of statistical significance. I do not think that many will accept the statement that "at 14 months the babies who were breast-fed longest were very slightly 'less mobile' than the others." It is interesting to note that the average number of teeth in group 4 at 12 months was 6.04, as compared with 6.82 in group 1. But in what way does it matter?

In the section on the incidence of infection, I am not able to follow all the statistical arguments. But what is the meaning of the statement: "In the case of head colds it was often impossible to identify the precise mode of feeding at the time of the illness"? Do the data on the method of feeding depend on the mother's memory of what she did some months back? Having shown that the incidence of colds is greater, as is well known, in households in which there are schoolchildren, the writers do not say whether the incidence of households with schoolchildren is the same in the four feeding groups. If it were different, it would alter the incidence of infections in the various groups.

The writers discuss the fact that the bottle-fed babies weighed slightly more at 12 months than the breast-fed babies, and say: "We are therefore driven to the conclusion that, in spite of continuous medical supervision, minor degrees of underfeeding among the breast-fed babies had occurred and had been overlooked." Surely that argument is fallacious. Because one child weighs less than another at the same age it does not mean that he is underfed. Babies who are weaned early might well be given rather a lot of starchy foods, which would increase the weight. But surely there is no evidence to suggest that such babies are better because they are bigger.

There are other points in the paper which cast doubt on the validity of the results, but space will not permit of their consideration here.—I am, etc.,

Sheffield.

R. S. ILLINGWORTH.

SIR,—I found the Oxford breast-feeding survey by Drs. Alice Stewart and Celia Westropp (*Journal*, August 8, p. 305) very interesting, particularly as the findings were in rather striking contrast to a small survey I did in Bristol in 1942-3. In this survey, for which statistical details are, unfortunately, not available, 1,000 consecutive cases were studied. They were studied in four groups: (1) 1-6 months, subdivided into 1-3 months; (2) 6 months-1 year; (3) 1 year-18 months; (4) 18 months-2 years. They were investigated for colds, tonsillitis, otitis media, gastro-enteritis, broncho-pneumonia, and skin infections.

My figures showed that upper respiratory infections were definitely more common in the bottle-fed children in group 1. Gastro-enteritis was slightly more common and more severe in the bottle-feds up to 18 months. The incidence of bronchopneumonia in groups 3 and 4 was about equal, but was more severe in the bottle-fed babies. Skin infections, particularly eczema, were not frequent in bottle-feds in each age group.

The bottle-fed infants weighed more than the breast-fed, but maturity was not assessed, except in regard to crawling and walking. The breast-fed babies were, in this series, the more mobile—possibly, I thought, owing to being lighter in weight.—I am, etc.,

Farnham Royal, Bucks.

MARY HERFORD.

Clinical Research in the N.H.S.

SIR,—I would like to support the letter from Dr. G. I. Watson (*Journal*, August 1, p. 286).

"Systematic investigations undertaken deliberately and often over long periods" are just the sort of investigations which general practitioners, either singly or in groups, would be most likely to undertake successfully. The more intensive type of investigation is particularly difficult for them, except as members of a team led by whole-time research workers.

I am glad that Dr. Watson has pointed out this unfortunate misconception in the *White Paper*.—I am, etc.,

Cirencester.

R. E. HOPE SIMPSON.

SIR,—I have had some experience of clinical research supplemented by experimental research. I have come to the conclusion that clinicians, which includes general practitioners, should be given an opportunity of doing part-time research of not less than two sessions per week with generous remuneration. Clinical research should not be restricted to those of registrar status, and the staff of hospitals should be encouraged to do this part-time work.

A niche in a research laboratory, with the services of a trained technician, should be provided, preferably at a research institute attached to a teaching hospital or to a university, where the advice and help of the departments of anatomy, physiology, pathology, radiology, and physics, etc., are available. The co-operation and support of one's colleagues and a supply of clinical material are essential.

Animal experiments require a team of an experienced experimenter with a licence, a trained technician, and an observer (a clinician or research worker), and in some experiments a physicist is desirable. Animal experiments may last five or more hours.

A clinician who has retired from his hospital appointment is well able to do clinical research in his spare time. He will find it interesting and he will be able to contribute something useful to medicine.

I could enlarge on this theme and give more details, but space will not permit.—I am, etc.,

London, W.1.

E. D. D. DAVIS.

Indigestion in Childhood

SIR,—As a general practitioner I have read Professor Norman B. Capon's Refresher Course article on indigestion in childhood (*Journal*, July 25, p. 197) with special interest, for there are few patients who cause more trouble to parents and G.P.s than the child with indigestion or who "won't eat." In some ways the G.P. who follows these cases from babyhood to maturity, and sometimes from generation to generation, is more fortunately placed to observe them even than the paediatrician; so continuous practice in a small town for some 30 years must be my defence for making some contentious observations on the paper of an expert that I have read with pleasure, particularly his remarks on the general management of these cases.

The first comment I would make, which will doubtless be met with the criticism that I have a one-track mind, is that I am sorry Professor Capon only mentioned appendicitis in connexion with acute indigestion. In my experience it is a common cause of the chronic variety also. I know this is often disputed, but as I was, I believe, the first person in this country to postulate from clinical examination the existence of "measles appendix," which was shortly afterwards described by a German pathologist. I have at least some claim to be able to recognize a pathological appendix when I meet one. Incidentally, the histological features of the measles appendix are so characteristic that some years later a surgeon in America removed an appendix, sent it down to the pathologist, and received the diagnosis of measles before the rash appeared, which it duly did.

In these childish cases the children seldom complain of abdominal pain unless the appendix is lying just below the abdominal wall. A more common complaint is a "stitch" in the right leg presumably due to irritation of the ileo-psoas, on or near which the inflamed appendix is lying, on active movement. This in turn often leads the child to avoid strenuous games and so to keep away from other children and cling to its mother's

apron strings. Subconsciously it feels that it is not quite as other children are and all sorts of behaviour disturbances may arise. It is often good-looking and usually nervy and excitable, for the mildly inflamed appendix seems to act as a nervous irritant. On examination the most constant and characteristic feature is the presence of Ligat's reflex over the appendicular spot, but examination for this must be very gentle or the child's confidence will be lost and any replies untrustworthy. Often it is best to ask no questions at all, for if the hyperaesthesia is at all marked the little patient's whole frame will be felt to stiffen as the spot is gently pinched, or next time it is examined it may cry instead. Usually there is tenderness on deep but gentle palpation, and some degree of muscle rigidity or guarding can be appreciated. The reality of this rigidity can be demonstrated by looking at the child with its shoulders bare, for the right shoulder will often be found an inch or so lower than the left owing to the constant excessive tone of the right abdominal muscles. (There are of course other causes of this crooked stance, but in my experience a chronic mild appendicitis is the commonest, and it is not normally present in a true acute appendicular flare-up, for relatively few of these cases ever progress to the common acute appendix.)

More might usefully be said about this condition, but I will only add that in these cases one can often wait months or years before deciding whether or when operation is desirable. It is, I think, commoner in girls than in boys, and, while the latter show some tendency to overgrow the condition, girls, I think, never do. If an operation is performed it must be done in such a way as not to terrify the child, and then the results for child, parents, and doctor are almost invariably gratifying.

The other point I would raise is that I am disappointed Professor Capon said so little about medical treatment. I know that it is fashionable to decry medicines, and especially glycerophosphates, but the fact remains that over 30 years I have found one preparation which does stimulate the appetite of these children in a remarkable way. I have seen it do it many times with my own children, and hundreds of mothers in Winsford have seen it with theirs. It is a long, complicated prescription known as Dr. Robin's formula for syrup, glycerophos. co. As it seems to vary according to the maker, I should say that for 25 years I have used that supplied by James Woolley & Co., of Manchester. I know of nothing else to touch it for stimulating appetite, though there may be others. I fancy that the most active principle may be the kola, but, as Lord Horder wrote of a much simpler mixture: "How much of the good which this preparation has done to humanity since some genius first invented it is due to any one of its ingredients none can say . . . nor at which part of the gastro-intestinal tract."

Of course there is a lot to be said against treating a symptom such as loss of appetite, but experience proves that if a child begins to eat well it usually begins to improve, and, though many of the conditions mentioned by Professor Capon may be pending or actually present, a healthy appetite goes a long way to make a healthy child, and these underlying or accompanying disorders tend to disappear.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

REFERENCES

- ¹ *British Medical Journal*, 1935, 2, 84.
- ² *Practitioner*, 1953, 170, 8.

Eczema and Reticulosis

SIR,—The description of a case of Sézary's reticulosis with exfoliative dermatitis by Drs. Harold T. H. Wilson and J. Fielding (*Journal*, May 16, p. 1087) has drawn attention to an important association which is more common than published evidence would indicate. It is customary to regard the reticuloses as a single pathological process which can adopt a number of histological and clinical appearances, either pure or mixed.¹ The frequency of the eczema-reticulosis association is evident from my series of approximately 60 malignant reticuloses, of whom eight patients have suffered from eczema (four with Hodgkin's disease and four with lymphosarcoma). All eight patients are living, with a relatively benign form of reticulosis. In seven patients the eczema developed either at the time of the appearance of the reticulosis or within the preceding year, while in one patient eczema antedated her lymphosarcoma by 10 years. Six patients have had a recurrence of eczema following the diagnosis of reticulosis. With one exception, the eczema was localized and controllable by superficial x-ray therapy

or skin lotions. Mycosis fungoides has been excluded in every instance. As a reticulosis usually has a subclinical onset several months before palpable lymphadenopathy, it may be assumed that the two pathological processes have had a concurrent onset in seven patients. Further evidence of the association of allergy with reticulosis is afforded by one patient aged 48 years who developed lymphosarcoma in 1947 and in each succeeding summer has had severe hay-fever. She had been well before 1947. This does not apply to the three cases of asthma in my series, one of whom lost his asthma five months before the onset of the reticulosis, while in two an existing asthma became less severe with the onset of reticulosis. These 12 cases would appear to offer evidence of a powerful antigenic factor in the early stages of the malignancy. An initial attack of eczema, hay-fever, or asthma may precede the appearance of a carcinoma.²

May I conclude with a plea to radiotherapists to investigate the incidence of allergic disorders in their patients with malignant lymphomas as a possible key to the riddle of cancer?—I am, etc.,

Wellington, New Zealand.

J. LOGAN.

REFERENCES

- ¹ Custer, R. P., and Bernhard, W. G. (1948). *Amer. J. med. Sci.*, 216, 625.
- ² Logan, J., and Saker, —. (1953). *N.Z. med. J.*, 52, 210.

Genetics and Clinical Research

SIR,—It was interesting to see your leading article on this subject (*Journal*, August 8, p. 326). I was sorry, however, to miss in it the name of one of the pioneers in this field, Professor Julius Bauer. This omission appears the more regrettable as he is well known to you, and you devoted a first leading article to his work in the past (*Journal*, April 24, 1943, p. 510).

Several of the problems mentioned in your present article have been studied intensively by J. Bauer and reported in original papers. I would like to mention—among many others—his studies on genetic factors in cancer and ulceration of the stomach; but, of course, in 1943 you yourself referred to the importance of his book *Constitution and Disease*.¹—I am, etc.,

London, S.W.3.

V. C. MEDVEL.

REFERENCE

- ¹ *Constitution and Disease: Applied Constitutional Pathology*, 1942, Grune and Stratton, New York.

Dr. Samuel Gee

SIR,—May I point out that, being misled by Sir Philip Manson-Bahr (*Journal*, August 1, p. 284), you have given Dr. Samuel Gee a title in your leading article (p. 266)? The story which was current in St. Bartholomew's Hospital 50 years ago was that one of his colleagues saw Dr. Samuel Gee in the Square, wearing a fine fur coat, and expressed the hope that he might receive some recognition for looking after a royal personage. Gee replied: "They asked me if I would like to be made a baronet, but I said I would much rather have a fur coat, and this," fingering the lapel, "is it."—I am, etc.,

London, W.1.

GEORGE GRAHAM.

Upside Down

SIR,—Dr. Wilfred Harris (*Journal*, August 8, p. 297) provokes us by saying: "We know from the optics of the eye that the image of any object seen is inverted on the retina. Why then do we see objects in their correct position and not upside down?" To see everything, including ourselves, as "upside down" would merely mean "upside down" in relation to perceptions derived from the other sense organs, and the position in space of the representation on the retina or visual cortex will have nothing to do with this relationship.

The young children he reports as seeing "all test letters upside down" are perhaps more mysterious than he makes out. If they simply saw everything upside down then they would be expected to draw the right way up, so that when

they looked at their drawing and saw it inverted it would match the object they were attempting to portray. Perhaps they are drawing from memory.—I am, etc.,

H. ASHER.

Physiology Dept., Birmingham University.

Myocardial Infarction

SIR,—The article by Dr. H. E. S. Pearson (*Journal*, July 4, p. 4) once again demonstrates the reduction in mortality and complications achieved by the use of anticoagulant therapy. Cardiac failure and its effects are important early complications which might be included when considering this subject. I have recently had under my care a man doing well under anticoagulant therapy with complicating congestive failure. Although the latter was treated, at the end of the third week he developed a sudden passive pleural effusion which proved fatal before medical aid could reach him.

Dr. R. A. Murray Scott (*Journal*, July 18, p. 151) quotes three references in support of his claim that prothrombin depression need not be taken below 60% of normal. I think these deserve some comment. Wright *et al.* achieved a 6% incidence of thrombo-embolism, with prothrombin levels of 20% and less. However, they went on to analyse their failures, and found that out of 38 such cases only four were actually in their desired therapeutic range of prothrombin depression, the others having escaped from control. Furthermore, they concluded that a considerable proportion of these failures were in fact due to inadequate prolongation of the prothrombin time. Burt *et al.*¹ described a series of cases of thrombo-embolism occurring in peripheral blood vessels, and did not describe any cases of coronary thrombosis. Their results are not therefore really comparable to the subject under discussion. Peters *et al.*² record the surprisingly optimistic figure of only 2% of thrombo-embolic complications in their series of 50 cases, rather than the 6% credited to them by Dr. Murray Scott. Their mortality rate of only 4% is also well below that of other writers, who usually put it at about 13.8%.³ However, their patients were selected ones in whom they claimed to have demonstrated an increased coagulability of the blood. They do not give details of the proportion of severe cases, or many clinical details. In view of these circumstances I feel that their results should be interpreted with reserve.

Finally, I would like to quote Gulchrist's opinion⁴ that adequate anticoagulant therapy has a favourable influence on shock in support of my plea for the prompt use of this treatment by the general practitioner.—I am, etc.,

Twickenham.

DAVID WHEATLEY.

REFERENCES

- ¹ *Amer. Heart J.*, 1948, 36, 801.
- ² *British Medical Journal*, 1949, 2, 1250.
- ³ *J. Amer. med. Ass.*, 1946, 130, 398.
- ⁴ Tulloch, J. A., and Gulchrist, A. R. (1950). *British Medical Journal*, 2, 965.
- ⁵ *Ibid.*, 1952, 2, 351.

The Egg Maligned

SIR,—My morning bacon and egg is being impugned by Dr. H. W. Fullerton *et al.* (*Journal*, August 1, p. 250). It is literally blood-curdling, and, despite the cautious wording of the authors, already many a casual reader of the daily press may be switching to a Continental breakfast. It is hard to relate our restricted consumption of fats during the last years to the rising incidence of coronary thrombosis. For my own part I shall continue to take an English breakfast, and shall comfort myself with the reflection that coagulation has its virtues and that not every clot is clumsy.

As a surgeon I see arteriosclerosis and secondary thrombosis mainly in the lower limbs of patients complaining of intermittent claudication. In the last few years I have advised over 300 such patients, and, though I know nothing of their breakfast habits, I cannot recall a single one who was not an inveterate cigarette smoker. The link between cigarettes and arteriosclerosis in the lower limbs appears to me to be almost invariable and quite inescapable. I can recall only one patient who was able to give up smoking for even a few weeks, and he, poor fellow, died of coronary

thrombosis shortly after an operation. About coronary thrombosis itself I must write with more caution, because this is a disease which, in general, I have not studied. In claudication, however, the coronary accident is so common, and so frequent a cause of death, that the two do appear to be related—at least to each other if not to tobacco.

Your authors say that "the pathogenesis of arteriosclerosis remains obscure." Without any reference to tobacco, they indict, albeit tentatively, the egg. This seems so unfair that it has stung me into writing this letter and saying something I have been wanting to say for a long time.—I am, etc.,

Liverpool, 7.

CHARLES WELLS.

The Role of the Pathologist

SIR,—Drs. M. Goldman and D. H. Miller (*Journal*, July 25, p. 227) accuse pathologists of being "self-appointed judge and jury of their clinical colleagues." May I remind them that they appear in court as witnesses on oath and answer the interrogation of judge, counsel, or coroner to the best of their ability? They are not permitted to give a spontaneous expression of their views. They are in fact already "confined to a statement of facts and, at the most, an expression of opinion as to the cause of death."—I am, etc.,

Keighley.

IAN STEWART.

Malaria in Ex-Servicemen

SIR,—I was very interested to read the letter by Drs. A. F. Knyvett and F. D. Schofield (*Journal*, August 8, p. 339) on malaria in ex-Servicemen. I thought the following two cases might be of interest.

Case 1.—A Territorial soldier, aged 22, admitted with pyrexia and generalized muscular aches of 24 hours' duration. No diagnosis was made at this time because of the bizarre and seemingly unrelated nature of the symptoms, which included vague abdominal pains and headaches. A peripheral blood smear taken during a rigor 96 hours after admission revealed the schizonts of *Plasmodium vivax*.

Case 2.—A regular soldier, aged 24, also admitted with a very similar history of malaise and pyrexia, but he had carried on for six days without reporting sick. This case also had many of the features of an "influenzal" illness, but here again a peripheral blood smear examined at 24 hours demonstrated the schizonts of *Plasmodium vivax*.

Both these patients were seen within six weeks of each other and had served in Korea last summer. One had returned eight months ago and the other six months ago. No previous history of malaria was obtained, although the first patient had had a mild pyrexial illness with one rigor shortly after returning to this country. Both men had taken the issue of proguanil whilst overseas.

First impressions in both—namely, that they were cases of influenza—tended to obscure the diagnosis, which in the first was not made until the periodicity of the rigors was recognized after 96 hours. There were no other signs in either case, such as splenomegaly, to assist in arriving at the diagnosis.—I am, etc.,

Holt, Norfolk.

W. A. CRABBE.

Polyarthritis in Rubella

SIR,—I was most interested to see that Dr. K. H. Pickworth (*Journal*, August 8, p. 339) and Dr. G. W. Lewis (*Journal*, July 18, p. 149) found, as I did (*Journal*, June 20, p. 1388), that the complication of polyarthritis in rubella seemed to be confined to adult women. I can think of no other infectious illness affecting both children and adults which behaves so differently in the group of adult women only, and in this curious fact there may be hidden some clue to the aetiology of the arthritis. Dr. Pickworth suggests that the polyarthritis of rubella is allied to the aches and pains that occur at the beginning of the majority of infections, and he goes further and suggests that all these phenomena are allergic and allied to serum sickness.

I cannot agree, for the following reasons: (1) The polyarthritis continued in my experience long after any slight fever associated with the rash, and in 5 out of my 16 cases

first appeared on or after the second day of the illness. (2) The severity of the pains in the joints was out of all proportion to the mildness of the illness itself. (3) If the polyarthritis were in the nature of an allergic response it would be reasonable to suppose that there might be an accompanying eosinophilia and that the joint symptoms would subside if antihistamine drugs were given.

In two of my cases blood films were examined for eosinophilia and there was none. Four of my cases received diphenhydramine, 50 mg. three times a day, without any alteration of joint symptoms.

Four cases is, admittedly, a small number, but soon after plans were laid for investigating the possibility of the allergic nature of the arthritis the epidemic died out.—I am, etc.,

Wantage.

I. S. L. LOUDON.

Intravenous Picrotoxin for Barbiturate Poisoning

SIR,—Intravenous picrotoxin, as advocated by Dr. R. S. Saxton (*Journal*, July 25, p. 227), is not without hazard. I have seen a patient on more than one occasion in coma from barbiturate poisoning having convulsions as a result of picrotoxin therapy, while in no way coming out of the coma. In serious cases, which nowadays occur not infrequently in the course of a routine "take in," gastric lavage is always indicated, and hospital treatment should not be denied to these patients. One sees cases surviving after three or more days in coma, and psychiatric aftercare may be instituted speedily under in-patient conditions.

All cases recently reviewed in a Scandinavian paper¹ were treated with amphetamine, as picrotoxin was considered too toxic for routine use.—I am, etc.,

Collingbourne Ducis,
Wilts.

B. H. BASS.

REFERENCE

¹ Nilsson, E. (1951). *Acta med. scand.*, suppl. 253.

Please Wash Your Hands

SIR,—All G.P.s, not to mention the general public, must by now be heartily tired of the gastro-enteritis which has become endemic in this country in the last few years. Public health activities seem confined to looking for carriers after major outbreaks, but the number of carriers must be legion and this seems a hopeless task. There seems to be some agreement that nine-tenths of the trouble would stop if the public were educated to wash their hands after visiting the lavatory, but no one educates them.

I should like to suggest a simple solution. If every public lavatory abolished the charge for a wash, and exhibited a notice saying, "Please wash your hands before leaving. No charge," the result would probably be as effective as in the two precedents of "Please do not spit" and "Please adjust your dress before leaving." Once it became a habit in public lavatories it would soon become a habit elsewhere.

If the Ministry of Health offered to pay local authorities the cost, it would soon make a profit from the reduced number of prescriptions for sulphonamides and antibiotics. Is it possible for our public health colleagues to use their influence in bringing about this reform?—I am, etc.,

Ashted, Surrey.

W. EDWARDS.

Brain of Kernicteric Infants: An Appeal

SIR,—I would be very grateful for specimens of the brain of kernicteric infants. I am investigating the pigments occurring in the blood and tissues of infants affected with haemolytic disease of the newborn, and there is at present an extreme shortage of post-mortem material from infants dying of kernicterus. The specimens should preferably be unfixed, as formalin and alcohol seem to affect the pigments.

If any specimens occur I can arrange for them to be collected within a radius of 100 miles of Manchester if a telegram or 'phone call is made to URMston 4022 or SALE 3111.—I am, etc.,

Park Hospital, Davyhulme,
Urmston, nr. Manchester.

D. C. A. BEVIS.

Obituary

Dr. S. M. VASSALLO, formerly a senior specialist officer in surgery in the Colonial Medical Service, died suddenly at his home at Epsom, Surrey, on July 23, at the age of 62. Salvatore Michael Vassallo was born in Malta on January 28, 1891, and received his medical training at the University of Malta, where he graduated M.D. in 1913, gaining a Government exhibition for first place. He then came to England as a postgraduate student, and in 1914 entered the Colonial Medical Service, being posted to the Leeward Islands as a medical officer. From 1917 to 1919 he served as a captain in the R.A.M.C., and was mentioned in dispatches. On demobilization he resumed his work in the Colonial Medical Service, this time in Uganda, returning to England to take the D.T.M.&H. in 1922. In 1925 he was appointed resident surgical officer in Zanzibar, the title of his post being changed to that of senior specialist officer ten years later. In 1928 he was admitted F.R.C.S. Ed. While in Zanzibar Dr. Vassallo was medical adviser to the Sultan from 1925 to 1939, and he was President of the Zanzibar Branch of the British Medical Association in 1929–30, and again in 1934–5. In 1936 the insignia of the third class of the Order of the Brilliant Star of Zanzibar was conferred upon him; he also received the King's Silver Jubilee Medal in 1935 and the Coronation Medal in 1937. When war broke out again in 1939 Dr. Vassallo immediately re-entered the R.A.M.C. as a lieutenant, being promoted to major in three months, and served first as a surgical specialist and then, from 1942, as the officer in charge of a surgical division. He remained in the Army until November, 1948, by which time he had attained the rank of lieutenant-colonel. He was mentioned in dispatches in 1941. On his return to civilian life he became senior surgical specialist at the Royal Herbert Hospital, Woolwich, a position he held until his retirement last year. Dr. Vassallo leaves a widow and one daughter.

Dr. B. Spearman, late Director of Medical Services, Zanzibar, sends the following appreciation: For 10 years I was in constant touch with Dr. Vassallo and saw that with diverse nationalities—European, Arab, Indian, and African—he proved a boon and a blessing. A surgeon of outstanding abilities, he never spared himself and worked long hours in the tropical heat, and one sometimes wondered at his staying capacity. While on leave he continued his studies and took the Edinburgh F.R.C.S. He was also a capable and wise physician and thoroughly experienced in tropical diseases. Everyone, whatever his faith or creed, put his faith in Michael, and his patients came from India and all parts of East Africa. He retired in 1939, only to rejoin the R.A.M.C. In his spare time he served as honorary secretary to the East African Pensioners' Association, and all those who received benefits through this organization owe him a big debt of gratitude. Knowing seven languages, he did much abstracting work for *Abstracts of World Medicine* and *World Surgery*, and for the *Journal of Urology*. The sympathy of all who knew him, of whatever creed or colour, whether in the United Kingdom or scattered throughout the British Empire, goes out to his wife and daughter in their irreparable loss.

Lieutenant-Colonel A. B. Dempsey, R.A.M.C., writes: Michael Vassallo, after a distinguished surgical career in Zanzibar for 25 years, brought to the Army Medical Services a wealth of clinical wisdom and practical surgical experience when he left a well-earned retirement to volunteer at the outbreak of the last war. He served with distinction in the Middle East for some years, but it is for his work at the Royal Herbert Hospital, Woolwich, from 1944 to 1952 that he will best be remembered. During this period many regular surgeons passed through his hands when he was in charge of the surgical division. They were working, in every case successfully, for higher surgical

qualifications, and their successes were in no small part due to his kindly advice, teaching, and encouragement, and to the fact that at considerable personal inconvenience he carried a very heavy load himself in order to allow them more time for study. "Vass," as he was known to his many friends in the Royal Army Medical Corps, will be greatly missed. His quiet smile, often hiding an almost impish sense of humour, endeared him to all his juniors. He will be remembered with affection and gratitude by surgeons now serving in many parts of the world, who owe him much.

By the sudden death of Dr. SAMUEL ROSE at his home on July 1 at the age of 55, Wimbeldon has lost a popular and skilful general practitioner. Samuel Rose was born in New York on October 5, 1897, and was educated at University College School, London, and at Guy's Hospital, where he qualified in 1919. Two years later he took the London degrees of M.B., B.S. After a house-surgeoncy at Guy's he became senior assistant medical officer at Fulham Infirmary. In 1924 Dr. Rose settled at Wimbeldon, in partnership with three other doctors, and soon developed a large practice. His professional skill, his kindly manner, and his sympathetic approach to other people's problems made him a popular member of the local community. For many years he was a member of the honorary staff of Wimbeldon Hospital, and he acted also as deputy police surgeon and Treasury medical officer for West Wimbeldon. In the last war he served as a medical officer in the Home Guard, a heart affection preventing him from giving full-time service in the Forces. Despite this disability, which ultimately caused his death, he continued his work throughout the war, and many local residents, including those injured in air raids, owe much to his ability as a surgeon. Dr. Rose had wide interests, and his genial manner and great vitality brought him many friends. Interested in all kinds of sport, he was an enthusiastic member of the Royal Wimbeldon Golf Club. He leaves a widow and two daughters.

Dr. J. R. HALL died at Wingate, Co. Durham, on July 10 at the age of 70. Born on December 6, 1882, the son of the late Mr. W. T. Hall, J.P.—the first chairman of the Bellingham Rural District Council—John Robertson Hall was educated at Dollar and Edinburgh Academies and at Edinburgh University, where he graduated M.B., Ch.B. in 1907. Soon after graduation he joined his brother, the late Dr. W. T. Hall, in practice at Newcastle-upon-Tyne. In 1911 he set up his plate on his own account at Fence Houses, Co. Durham, and there he remained until 1938, when he moved to Wingate, except for a period of service in the R.A.M.C. in the war of 1914–18. He was invalided out of the Army after receiving wounds in the Battle of the Somme. Always attracted to the work of the St. John Ambulance Association, to which he had been an examiner since 1914, Dr. Hall was a popular lecturer to first-aid classes. He was appointed a Serving Brother of the Order of St. John of Jerusalem in 1937. The outbreak of the last war in 1939 saw an increase in his activities on behalf of the Association, but he found time to lecture also on air-raid precautions and to serve on medical boards. In addition he was a captain in the Home Guard. Outside his profession Dr. Hall derived much satisfaction from the study of Border history, and, having a good memory, he could be relied upon to provide many an interesting reminiscence. He leaves a widow.

The untimely death of Dr. LOUIS SHELDON at the early age of 49 has deprived the practice of medicine in Willesden and Wembley of one of its outstanding figures; for Louis Sheldon was one of that breed of men who shed lustre on their profession, and to whom hard work did not spell hardship. Born in South Africa on October 30, 1903, Sheldon came to England at the age of 21, and qualified L.M.S.S.A. from the London Hospital in 1926. He took over an old-established practice in Willesden soon afterwards, and there

for 25 fruitful years he was guide, philosopher, and friend to an ever-increasing circle of patients. He allied clinical acumen of a high order with boundless energy, and inevitably acquired a splendid reputation as a practitioner in the best family-doctor tradition. He did not spare himself, and on many an occasion Sheldon would excuse himself to his guests—there was nothing he liked better than to play the host—to go and visit a patient in response to an urgent message. This spirit was apparent even during his last illness, when he was to be seen, driven by his son, for he was no longer able to drive his car himself, doing his round of visits, an ill man and obviously suffering. During his busy life he found time for broader interests and served on the executive committee of the Willesden Division of the British Medical Association, where his unobtrusive good sense made him a valued member. He was well known at the Willesden General Hospital, where he worked for some time as clinical assistant, and at the West End Hospital for Nervous Diseases. His local interests were many. He served as medical officer to the local Red Cross detachment, St. John Ambulance Brigade, and the Willesden Air Training Cadets, and, in another field, as medical officer to the Hendon Football Club, a reflection of his youthful enthusiasm for soccer and his days in the London Hospital first eleven. During the last war he was one of those whose work at the Stonebridge first-aid post during the worst days is still remembered. All in all he left his mark on Willesden, and his death leaves a gap which will not easily be filled. His patients' sorrow can best be epitomized in the inscription on a wreath sent by one of them—"To our dear doctor and friend." His colleagues in Willesden will not soon forget him. To his widow, who bore the great strain of his last illness with wonderful courage, and to his son, who carries on the medical tradition of his father, his colleagues and friends offer their heartfelt sympathy.—M. M.

Medico-Legal

FATAL PENICILLIN INJECTION

At an inquest held in Kingston-upon-Hull on July 14 the coroner recorded a verdict of misadventure on a woman aged 41 who had died from anaphylaxis following an injection of penicillin administered for pyrexia during delivery.

After a normal pregnancy the patient was admitted to hospital at 10.30 a.m. on June 30. The same evening she was still in early labour and was given morphine $\frac{1}{2}$ gr. (16 mg.). On the evening of July 1 she developed a temperature of 101° F. (38.3° C.). No cause for the pyrexia was apparent, but she was given 400,000 units of procaine penicillin intramuscularly at 6.30 p.m. At 7.30 p.m. the patient vomited; two minutes later she had a labour pain, and while at the height of this pain she suddenly collapsed. She immediately became unconscious, and her breathing was stertorous as in cerebral haemorrhage. Despite all attempts at resuscitation she died within a few minutes. The patient had had previous injections of penicillin, though she had no history of previous reactions to it. Other patients had received injections from the same batch of penicillin without ill effect.

Dr. James Ross McKenzie, senior registrar, Kingston General Hospital, Hull, who did the post-mortem examination, said there were signs of asphyxia, with many petechial haemorrhages over the surfaces of the lungs. He gave the cause of death as anaphylaxis following the injection of penicillin. He was able to find only two such cases reported in this country out of the millions of penicillin injections which had been given. Only one such case had been reported in the American literature.

The coroner, in summing up, suggested that it would be a wise precaution for any patient who had had a previous reaction from penicillin to tell a new doctor about it before penicillin was administered.

Universities and Colleges

UNIVERSITY OF OXFORD

The following medical degrees were conferred on June 25:

D.M.—W. D. M. Paton, R. Seidelin, G. Loewi.

B.M.—R. B. Roe.

On July 1, in connexion with the centenary of Cecil Rhodes and the jubilee of the Rhodes scholarships, the honorary degree of D.C.L. was conferred on W. G. Penfield, O.M., Honorary Fellow of Merton College, Director of the Montreal Neurological Institute, and Professor of Neurosurgery in the University of McGill.

In Congregation on July 18 the following medical degrees were conferred:

D.M.—R. M. Mason, J. T. Wright.

B.M.—B. C. Davies, B. J. Drake, W. A. F. Macdonald, H. Merskey, P. S. Mitchell, G. L. Feinstein, G. C. Fisk, M. R. C. Heffernan, M. P. Carter, J. G. Ross, J. H. Fairley, P. D. P. McGrath, C. J. Good, I. E. Hughes, V. Parsons, R. W. G. P. Best, J. B. L. Gee, J. A. Kay, G. A. Rose, Christian A. K. Carritt, Diana J. Collins, Rosalind M. Rewcastle, *C. E. Elliott, *N. R. Garden, *R. E. Gillson, *F. I. Caird, *J. I. McFeeters, *Priscilla A. Clark-Maxwell.

The Theodore Williams Scholarship in Human Anatomy for 1953 has been awarded to Oliver Wolf Sacks, Scholar of Queen's College.

The Radcliffe Scholarship in Pharmacology has been awarded to Antony Babington Herring (Brasenose College) and John Verrier Jones (University College).

Dr. R. S. Creed has been elected a member of the Board of Studies for Psychology for two years from October 1, 1953.

*In absence.

UNIVERSITY OF GLASGOW

The following medical degrees were conferred on July 4:

M.D.—P. A. Duke, *G. M. Edington, *C. R. Forrest, *J. MacGillivray, *A. F. McLean, W. W. McNeish, D. G. Scott.

M.B., Ch.B.—J. Allan, J. M. Atkinson, J. T. B. Bain, Muriel M. E. Barr, *J. S. Beck, Sheila J. D. Black, M. Blair, D. A. P. Brown, D. D. Bryson, T. H. L. Bryson, R. T. Cameron, J. S. Cant, R. L. K. Colville, I. J. Coulthart, J. L. C. Dall, A. Davidson, J. S. H. Davidson, J. A. S. Dickson, H. P. Dinwoodie, A. Donnelly, J. A. Duncan, I. E. Farrington, H. C. Ferguson, A. H. Findlay, Margaret E. Finlayson, T. Forrest, J. Frame, W. Gallacher, H. H. Gebbie, Lilian M. Gibson, Biruta R. Giedraitis, I. E. Gillespie, S. S. Graham, J. H. Graham-Marr, M. Haase, W. A. McL. Hall, L. Harris, D. D. Hart, Grace J. K. Harvey, J. C. Henderson, Martha C. Howat, R. McN. Howie, R. M. Humble, R. Hume, Isobel H. Hunter, A. G. Hutchison, Margaret W. Irwin, G. H. Johnson, J. A. Johnston, Margaret N. S. Johnston, C. C. Keay, J. D. Kinloch, J. W. S. Knox, K. A. Kwarko, T. J. Lees, H. C. Leslie, J. G. Lindsay, L. E. Loneragan, E. C. McCracken, Morag C. McCulloch, J. C. H. McDonald, C. G. McEwen, A. McGowan, Berthea J. MacGregor, W. L. MacIndoe, Eleanor M. MacIver, T. M. McKendrick, Catriona Mackenzie, A. C. MacLachlan, K. M. McLaren, J. C. MacLaurin, Lindsay McLeman, P. B. McMain, J. P. McMillan, G. W. Macnab, Christine McNair, *M. W. McNicol, W. A. Maley, T. S. Mann, F. Mariotti, J. J. F. Merry, H. McL. Morgan, Elizabeth A. Mowat, I. S. Murray, J. W. Myles, G. F. Nabi, E. G. Oram, J. R. Paterson, P. M. Peacock, J. G. Provan, Maria A. Ratzer, C. B. Rennick, C. J. C. Renton, J. A. Riddell, A. Robertson, K. M. Robertson, A. J. Rosin, Margaret C. Russell, R. C. I. Russell, R. J. Scott, R. Shields, A. M. Short, *J. D. Sleight, V. B. Slorach, Margaret B. Smith, M. G. H. Smith, N. M. Smith, V. Smith, Kathleen A. R. Smith, W. T. Sommerville, C. Sorbie, Isobel Speirs, J. M. Stark, Norah E. Stewart, J. R. Styles, V. Sweeney, Lilian M. G. Tait, T. E. Torbet, J. J. Treanor, R. D. Unkles, D. H. Urquhart, J. M. T. Warnock, J. McL. Williamson, A. Wilson, D. W. Wylie.

*In absentia. *With high commendation. *With commendation. *With honours.

UNIVERSITY OF LONDON

Dr. J. D. N. Nabarro and Dr. Howard Nicholson have been recognized as teachers of medicine in the University at University College Hospital Medical School.

The Sir William Dunn Scholarship for 1953-4 has been awarded to Barbara Joan Boucher (London Hospital Medical College).

Vital Statistics

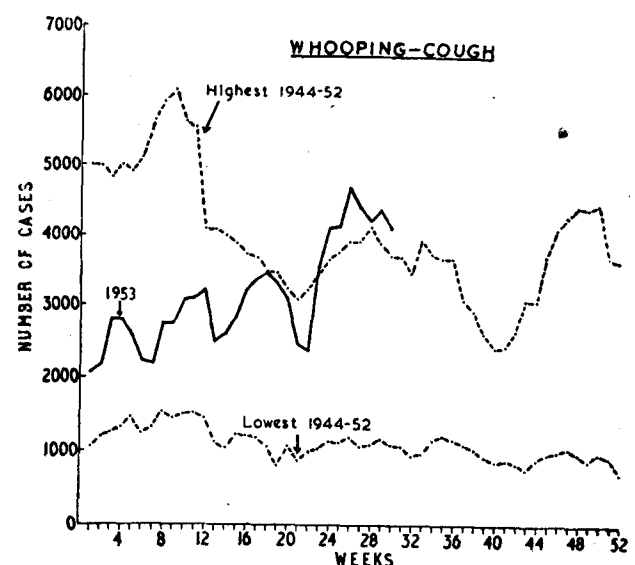
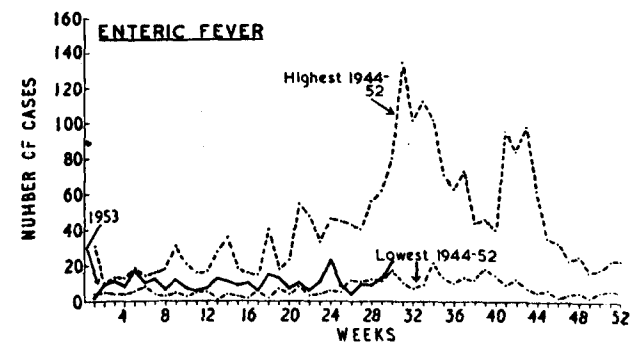
Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending August 8 (31st week of the year) were as follows: paralytic, 181 (167); non-paralytic, 116 (103); total, 297 (270). This is an increase of 27 compared with the previous week, the figures for which are in parentheses. The individual districts which have notified 20 or more cases in the year to August 8, with incidences per 100,000 in parentheses, are as follows: Southend-on-Sea C.B., 37 (24.42); Liverpool C.B., 25 (3.16); Birmingham C.B., 46 (4.11); Coventry C.B., 76 (29.12); Leicester C.B., 22 (7.69); Lewisham M.B., 22 (9.69); Blackpool C.B., 21 (14.26); Camberwell M.B., 20 (11.04); Islington M.B., 21 (8.92); Bournemouth C.B., 25 (18.00).

The seasonal rise in the notifications of poliomyelitis is not gaining momentum. The increase in paralytic cases was two less than in the previous week (14 compared with 16), and there is still hope that the curve will be like that for 1952. Although the seasonal rise is expected to continue, the outlook is somewhat more favourable than it appeared to be a month ago. Epidemic proportions are not being approached in any of the greater centres of population.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ————, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



UNIVERSITY OF LEEDS

Dr. Geoffrey Watkinson, lecturer in the Department of Medicine, has been granted leave of absence for the session 1953-4 to enable him to take up a Rockefeller Travelling Fellowship.

The Services

Major-General F. Kingsley Norris, C.B.E., D.S.O., E.D., R.A.A.M.C., has been appointed Honorary Physician to the Queen, and Colonel K. B. Fraser, E.D., R.A.A.M.C., Honorary Surgeon to the Queen.

Major-General F. C. Hilton-Sergeant, Q.H.P., late R.A.M.C., has been appointed Commandant and Director of Studies, Royal Army Medical College, in succession to Major-General F. R. H. Mollan, C.B., O.B.E., M.C., Q.H.S., late R.A.M.C., who is retiring.

Colonel A. Swindale, C.B.E., T.D., has been appointed Honorary Colonel of a T.A. Unit in succession to Colonel A. H. Whyte, D.S.O., T.D., whose tenure has expired.

A Supplement to the London Gazette has announced the following appointments in recognition of gallant and distinguished services in Korea:

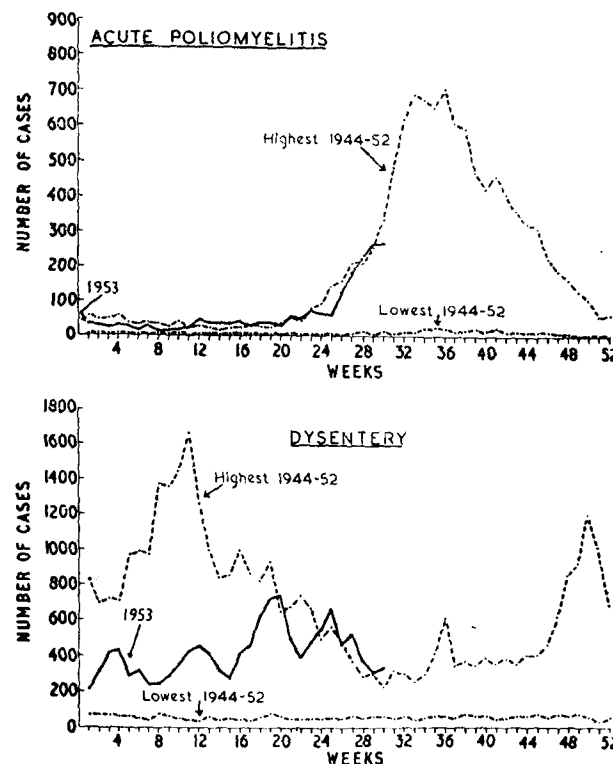
C.B.E. (Military Division).—Colonel G. L. M. Smith, O.B.E., C.D., R.C.A.M.C.

M.B.E. (Military Division).—Lieutenant-Colonel (Acting) R. A. Smillie, R.C.A.M.C.

A Supplement to the London Gazette has announced the following awards:

First Clasp to the Territorial Efficiency Decoration.—Major R. Barraclough, M.B.E., T.D., and Captain (Honorary Major) H. R. Vernon, R.A.M.C.

Territorial Efficiency Decoration.—Major (Honorary Lieutenant-Colonel) J. B. McEwen, M.C., and Captain (Honorary Major) H. R. Vernon, R.A.M.C.



Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending August 1. The largest falls in the number of notifications were 807 for measles, from 4,394 to 3,587, 250 for whooping-cough, from 4,357 to 4,107, and 87 for scarlet fever, from 1,037 to 950.

The largest falls in the number of notifications of measles were 133 in Lancashire, from 804 to 671, and 71 in Somersetshire, from 162 to 91. A small decline in the incidence of scarlet fever was recorded in every region except the north-western, where the notifications were 42 more than in the previous week. The largest decline in the number of notifications of whooping-cough was 42 in London, from 389 to 347. 11 cases of diphtheria were notified, 6 fewer than in the previous week.

270 cases of acute poliomyelitis were notified during the week. These cases were 16 more for paralytic and 12 fewer for non-paralytic than in the preceding week. The chief centres of infection were still in the southern section of the country and were London 34 (Camberwell 5, Islington 5, St. Pancras 5, Lambeth 4), Essex 22 (Chelmsford M.B. 4), Middlesex 21 (Finchley M.B. 3, Heston and Isleworth M.B. 3), Southampton 19 (Bournemouth C.B. 8), Surrey 16 (Croydon C.B. 3, Reigate M.B. 3), Warwickshire 16 (Coventry C.B. 13), Kent 15 (Maidstone M.B. 4), Lancashire 14 (Liverpool C.B. 3), and Cheshire 10 (Nantwich R.D. 4).

334 cases of dysentery, 25 more than in the preceding week, were notified. The largest returns were Lancashire 67 (Blackburn C.B. 24, Manchester C.B. 15), London 35, Yorkshire West Riding 27, Durham 26, Middlesex 21, and Essex 18.

The largest outbreaks of food-poisoning notified during the week were 131 cases in Camberwell, London, 119 cases in Prestatyn, Flintshire, 100 cases in Wakefield C.B., Yorkshire West Riding, 69 cases in Consett U.D., Durham, and 54 cases in Lancaster M.B., Lancashire.

Week Ending August 8

The notifications of infectious diseases in England and Wales during the week included scarlet fever 690, whooping-cough 3,864, diphtheria 22, measles 2,730, dysentery 217, paratyphoid fever 12, typhoid fever 3, and food-poisoning 415.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending August 1 (No. 30) and corresponding week 1952.

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

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

CASES In Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	11	0	6	1	1	21	0	6	1	
Dysentery ..	334	35	84	1		135	19	45	0	
Encephalitis, acute..	5	0	0	0		5	0	0	0	
Enteric fever: Typhoid ..	4	1	0	0	1	5	0	2	0	2
Paratyphoid ..	19	2	2	0	4	75	1	0	0	
Food-poisoning ..	769	169		0		231	17		0	
Infective enteritis or diarrhoea under 2 years ..					13	46			14	23
Measles*	3,587	80	83	83	82	7,363	844	96	128	193
Meningococcal infection ..	21	2	12	2		34	4	9	1	
Ophthalmia neonatorum ..	37	4	4	0		39	5	9	0	
Pneumonia†	222	11	99	0		247	10	142	4	1
Poliomyelitis, acute: Paralytic ..	167	22	13	18	10	157	23	9	6	1
Non-paralytic ..	103	12				96	10			
Puerperal fever‡	232	18	5	0		260	31	14	2	1
Scarlet fever ..	950	53	97	20	31	1,173	113	144	16	53
Tuberculosis: Respiratory ..			129	32				121	32	
Non-respiratory..			32	2				23	10	
Whooping-cough ..	4,107	347	369	55	37	2,040	97	91	70	133

DEATHS In Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	2	0	0	0	0	2	1		0	
Dysentery ..	0	0		0		0	0			
Encephalitis, acute..	0				0	0				
Enteric fever ..	0	0	0	0		0	0			
Infective enteritis or diarrhoea under 2 years ..	5	1	1	1	2	7	2	0		
Influenza ..	3	1	0	0	0	6	0	2	0	
Measles ..	0	0	1	0		0				
Meningococcal infection ..		1	0			1	1			
Pneumonia ..	117	12	6	3	5	129	21		10	
Poliomyelitis, acute	10	0			0	6	3			
Scarlet fever ..	0	0	0	0	0	0	0			
Tuberculosis: Respiratory ..	85	13	10	1	3	83	8	16	3	
Non-respiratory..		1	1	0	0		2	1	0	
Whooping-cough ..	5	1	0	0	1	0	0			
Deaths 0-1 year ..	201	30	24	9	13	204	23	15	10	
Deaths (excluding stillbirths) ..	4,284	590	455	87	130	4,177	609	523	96	
LIVE BIRTHS ..	7,974	1,204	921	230	394	7,310	1,090	898	244	
STILLBIRTHS ..	187	21	23			177	19	29		

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

Medical News

Family Rehabilitation.—The Elizabeth Fry Memorial Trust has just issued an account of the establishment of the Spofforth Hall Recuperative Centre, to which mothers (and their children) are sent who fail to provide a satisfactory home for themselves and their families. The majority of the mothers have simply failed to cope with domestic problems and difficulties, and have reached a point when they have accepted defeat and allowed the home conditions to deteriorate. A small proportion of the families are those in which the parents have already been charged in the courts with neglecting their children. Instead of sending the mother to prison, often the prelude to the permanent collapse of the home, she can be put on probation and, with the consent of the Home Office, may be required to accept at least four months' residence at Spofforth Hall, which is near Harrogate. "In more human terms the results of homes which have failed are seen in the dispirited mothers and pathetic babies and children who come to Spofforth Hall." The home was established under the auspices of the Society of Friends, and the first families arrived last November. The demand for accommodation has grown rapidly since then, and the trustees have decided to adapt an extra wing of Spofforth Hall in order that three more families may be received. Although the cost of maintaining most of the families is met by statutory authorities, there is still need for generous public support of this worthy project.

Society of Apothecaries.—On August 18 the Society elected as Master Dr. H. Seaward Morley, as Senior Warden Sir Cecil Wakeley, P.R.C.S., and as Junior Warden Dr. N. S. Finzi.

NEW ISSUES

Journal of Neurology, Neurosurgery, and Psychiatry.—The next issue (Vol. 16, No. 3) will be available in a week's time.

Journal of Clinical Pathology.—The next issue (Vol. 6, No. 3) will be available in a week's time.

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

SOCIETIES AND LECTURES

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

Tuesday, August 25

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.—5 p.m.,

Professor John Fulton (U.S.A.), Harvey Cushing: A Biographical Appreciation.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Hales.—On July 1, 1953, at the London Hospital, London, E., to Mary (formerly Notley), wife of John Hales, M.B., B.S., a daughter—Kathryn Mary.

Scott.—On August 11, 1953, at the General Hospital, Neath, Glamorgan, to Dorothy, M.B., Ch.B. (formerly Wood), wife of Dr. B. K. Scott, a daughter.

Walsh.—On August 5, 1953, at Saint John, New Brunswick, Canada, to Ruth (formerly Broughton), wife of Peter Walsh, M.R.C.P., of 260, Germain Street, Saint John, New Brunswick, Canada, a son—Robert Edward.

DEATHS

Jhangiani.—On July 5, 1953, Parmanand Harumal Jhangiani, M.B., B.S., D.M.R.E., of Canonbury, London, N.

Legat.—On July 23, 1953, at his home, 8, Hughenden Road, Clifton, Bristol, Robert Eddowes Legat, M.B., C.M., aged 83.

McMichael.—On July 28, 1953, Arthur William McMichael, M.R.C.S., L.R.C.P., of 27, Frenchay Road, Weston-super-Mare, late of Vowchurch, Herefordshire, aged 85.

Rafferty.—On July 28, 1953, suddenly, at Clayton Hospital, Wakefield, Patrick Joseph Rafferty, L.R.C.P.S.I. & L.M., of Westgate End House, Wakefield, Yorks, aged 54.

Raw.—On July 25, 1953, at Arday (Bonar Bridge), Ross-shire, Mary Raw, M.B., B.S., of Ravenswood, Low Fell, Gateshead, late of the Baptist Missionary Society's Dholpur Station, India.

Talbot.—On July 28, 1953, at his home, Coed-y-Castell, Deganwy, Caern., N. Wales, Philip Talbot, M.B., Ch.B., F.R.C.S., aged 72.

Any Questions?

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

Sensitivity to Oil of Bergamot

Q.—Is a skin reaction to oil of bergamot found only in certain sensitive individuals, or will it occur in anyone under appropriate conditions? What is meant by the term "photosensitivity," which is often used in describing bergamot reactions?

A.—The skin reaction to oil of bergamot is found only in certain people. In these subjects the application of oil of bergamot to the skin results in a temporary increase in light sensitivity on that particular area of skin. The mechanism by which this occurs is not known, but the substances most often involved are of vegetable origin, and for this type of reaction the term "phyto-photo dermatitis" was coined by Klaber,¹ whose original work should be consulted.

REFERENCE

¹ Klaber, R., and Wittkower, E. (1939). *Brit. J. Derm.*, 51, 501.

Vaginitis in Girls

Q.—What is the modern treatment of non-gonococcal vaginitis in small girls?

A.—The organisms responsible for the vaginitis should first be determined by examination (direct smear and culture) of the discharge obtained from the vagina by a swab or fine pipette gently inserted through the hymeneal opening. The possibility of a foreign body in the vagina should be considered and excluded, especially if the discharge is blood-stained as well as purulent.

The treatment of the vaginitis depends to a large extent on the organisms present and on their sensitivity to chemotherapeutic and antibiotic agents. The appropriate agent should be administered systemically, and at the same time it is an advantage to administer oestrone, 0.3 mg. twice daily by mouth, for three to four weeks. This latter increases the resistance of the vagina, but can have undesirable temporary side-effects such as enlargement of the breasts and uterine bleeding.

Intravaginal therapy is best avoided because of possible psychological reactions. However, under certain circumstances—trichomonal vaginitis, for example—it may be necessary to administer appropriate antiseptics by means of a small-sized vaginal pessary. Thrice-weekly instillations of a 0.5% aqueous solution of mercurochrome by means of a funnel and fine soft rubber catheter are useful in some cases.

Many other considerations arise, and these include measures to reduce the risk of transfer of the infection to other children, and the general management of the child and its mother to avoid introspective tendencies and over-anxiety.

Congenital Deformities of Fingers and Toes

Q.—What can be done surgically to correct congenital absence or fusion of the fingers or toes? When is the best time to start treatment?

A.—Little surgically can be done to correct congenital absence of fingers and toes. Later in life, provided some thumb metacarpal function remains, it may be possible to construct a gripping mechanism, but this will always depend upon the individual case.

Fusion of the fingers or toes is much more amenable to surgical treatment, and the excellence of the result depends upon the degree of webbing of the fingers. Where a simple skin web exists it can, under the best circumstances, be effectively separated to produce a good result without

deformity of the fingers. Where there is insufficient skin to make flaps to cover the fingers, a free graft may be introduced. Where the bones are fused the matter is much more difficult: although the fingers can be separated, mobile interphalangeal joints are not often obtained. The real difficulty lies in constructing an interdigital web which does not recur. The treatment of this condition is normally carried out by plastic surgeons. The best time to operate is between 3 and 5 years, when the child is fairly co-operative.

Aspirin Intoxication

Q.—What adverse effects are known to result from prolonged daily use of aspirin and allied preparations? Is the drug habit-forming?

A.—There is considerable individual variation in tolerance to the salicylates; but sweating, thirst, headache, dizziness, tinnitus, and nausea are signs of mild intoxication with these drugs. A more severe degree of intoxication is shown by fever, vomiting, diarrhoea, hyperpnoea, and severe excitation which may later change to coma. Aspirin has a particularly irritating effect on the gastric mucosa; in susceptible subjects it may produce gastric erosion with haematemesis if given as relatively insoluble tablets on an empty stomach. A few cases have been reported in which red striations of the skin, similar to those seen in Cushing's syndrome, have developed after very prolonged treatment.

Intolerance to the salicylates occurs occasionally and is shown by the development of a macular rash associated in the more severe cases with pyrexia and gastro-intestinal disturbance. The salicylates are not drugs of addiction.

Total Hysterectomy after the Menopause

Q.—It was recently stated that even at an advanced age the ovaries are seldom inert. In view of this, what physical and psychological symptoms would be likely to follow total hysterectomy in a woman aged 60?

A.—Although there is a good deal of evidence to suggest that the climacteric often occurs a few years after the menopause, and that meanwhile the ovaries are to some extent functional, few authorities would confidently assert that the ovaries produce significant amounts of oestrogen for very long after the menopause. Indeed, when oestrogen is found in circulation after the menopause it is often suggested that it has its origin in some other organ such as the adrenal cortex.

If a woman 60 years of age had the menopause at the usual time, and especially if it was accompanied by menopausal (or more strictly climacteric) symptoms, and if she shows the usual atrophic changes in the vagina and vulva, total hysterectomy with removal of both ovaries should not have any physical effects other than those directly related to the operation, nor is it likely to result in any psychological disturbance.

Wedding-ring Sensitivity

Q.—A young woman is unable to wear her 9 carat gold wedding-ring because it causes an itchy rash to appear under it. What is the cause, and what treatment is advised?

A.—Although occasionally psychological factors seem to be responsible for a localized eruption in this site, it seems more probable that in the case quoted the patient has become sensitized to the metal of her wedding-ring. Sensitivity to jewellery made of gold is not very common, but undoubtedly does occur. Such sensitivity usually lasts indefinitely, and the only solution is for the patient to avoid contact with the particular metal. In the case quoted, sensitivity may well be not to gold itself but to one of the metals used in the alloy. If this is so, different varieties of gold articles may not elicit the reaction. It might therefore be worth this patient trying a different gold ring to see its effect. Alternatively she will probably be able to wear a platinum ring without trouble.

NOTES AND COMMENTS

Syringes in General Practice.—Dr. DONALD MCGREGOR (Sutherland) writes: With regard to the question on this subject ("Any Questions?" July 25, p. 235) I would like to make the following comment. If syringes are carried in spirit, the needles must either be rinsed in boiled water in the patient's house before use (a tiresome procedure where water has to be sub-carried and there is only a peat fire) or the patient must be submitted to the irritation of 95% alcohol subcutaneously. This can be guaranteed to lose patients. I suggest that the proper routine is to carry the syringes in spirit-proof cases without the spirit in them. The cases are sterilized in boiling water at the same time as their contents, and simply and quickly drained of water. Pasteur's experiments with retorts and turned-up mouths, suggest that the syringes would, once housed in an empty, sterile, spirit-proof case, stay sterile indefinitely. Personally I re-sterilize any syringes I have not used each month to be on the safe side.

OUR EXPERT writes: Most of the spirit in the needle and in the barrel of a syringe which has been carried in a case containing 75% spirit can be removed by withdrawing the plunger several times and squirting. The last of the spirit can be removed by drawing up through the needle some sterile pyrogen-free water, or normal saline, carried in a rubber-capped bottle. Some of the solution that is to be injected may be used for this purpose if the makers of ampoules provide enough, as they often do, or if the injection is supplied in a rubber-capped bottle. If the syringe is to be used once only it can safely be carried, as your correspondent suggests, in an airtight case without spirit. But if the case contains six needles, and the barrel of the syringe is to be handled and used again with a different needle, it is safer to keep the syringe in 75% spirit.

Height and Weight Tables.—Mr. W. F. F. KEMSLEY (London, W.1) writes: On looking through the *Journal* of July 25 (p. 236) I have noticed in "Any Questions?" a reference to height and weight tables. In the reply it is stated that there are no up-to-date tables for heights and weights of British adults. This is not the case. Some time ago I compiled tables based on measurements made in 1943 on 27,000 men and 33,000 women. These tables will be found in the *Annals of Eugenics*, vol. 16, pp. 316-334, 1952, the paper being entitled "Body Weight at Different Ages and Heights." The paper explains how the tables were derived and gives comparisons between these new tables and earlier tables.

Dr. G. I. M. SWYER (London, W.C.1) writes: In the answer to the question on "height and weight tables" I am surprised to read: "Unfortunately, there are no up-to-date tables for the heights and weights of British children." There is an excellent book by A. Sutcliffe and J. W. Canham, *The Heights and Weights of Boys and Girls*, John Murray, London, 1950. This book includes data on some 17,000 English boys and girls, very carefully selected from all parts of the country and from different school groups, so as to avoid any possible bias. The tables give figures for 5 to 17 years inclusive, and I think would certainly supply your questioner's requirements so far as children are concerned. Perhaps the most valuable feature of this book is the inclusion of tables of height and weight indices calculated in an analogous fashion to intelligence quotients. These enable one to decide, when either height or weight is considerably different from the average, whether the two are proportionate or not. Moreover, they enable one, when following the growth of a child, to decide whether the increments are occurring at the expected rate. I find this book to be quite invaluable in my dealings with growing children.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 29 1953

First World Conference on Medical Education

President's Address

THE CHALLENGE TO MEDICAL EDUCATION IN THE SECOND HALF OF THE TWENTIETH CENTURY

BY

Sir LIONEL WHITBY, C.V.O., M.D., F.R.C.P.

Regius Professor of Physic, University of Cambridge

The title of my address has not been framed as a question, since there can be no doubt that the second half of the twentieth century offers a challenge to medical education, as indeed it offers a challenge to every variety of medical experience, to every aspect of medicine, and to the practice of medicine in every part of the world.

It is for me to examine the nature of the challenge and for you to listen in the coming week to speakers from all over the world who will make their contributions to our discussions, and who, though having in mind the general issue, will nevertheless instruct us in some of the particular difficulties of their own countries and conditions. For perhaps the first abiding value of this conference may be that we shall know more of each other and each other's conditions. There can be little doubt that when we individually think of medical education we think only of our own countries.

The world, however, has now become so shrunken, because of modern communications, that we can no longer take a parochial view of our problems, whether they be economical, political, social, or, above all, medical, since medicine mercifully knows no international boundaries and happily has the same ideals in all countries. Even when countries are at war their medical professions can co-operate and be at peace one with another in a common task. Fortunately, there is a growing world-wide awareness of the common bonds of medicine and the contributions which these can make to world peace.

The World Health Organization of the United Nations and the medical offshoot of Unesco, C.I.O.M.S., both intergovernmental in constitution, are a formal international recognition that medicine, health, science, and education present common world problems which can, in part, be faced and partially solved by men and women from different countries meeting together and expressing their views. Medical men themselves have realized the challenge by founding the World Medical Association, and I am proud to know that in this the British Medical Association has played a prominent part. The World Medical Association represents the field workers, those who have to do the job.

It would indeed be unusual, if not an indication of inertia and ill-health, if the practising doctors did not have their disagreements with intergovernmental planners. We regard the scene from different standpoints.

and I can understand at least this much of Einstein's theory of relativity, that what is observed depends upon the position of the observer.

It is perhaps significant that the first great project of the World Medical Association is the holding of the First World Conference on Medical Education, and it is also significant that it has secured the willing collaboration of the World Health Organization, whilst the support and interest of the International Association of Universities can only mean that the sure foundation of medical studies is the university and the university ideal.

The Challenge to Education

The first challenge which has come to the fore in the second half of the twentieth century is not confined to medical education, but is levelled at education itself, whatever calling or profession a man or a woman is to take up. The basic trouble is the same as with medicine, that the accumulation of knowledge is such as to demand early specialization and to make it impossible for a student to be comprehensive in his approach to his subject.

Abraham Flexner said that medical education was not so much a matter of medicine as of education. It is fortunate, therefore, that Sir Richard Livingstone, who has probed deeper than any of us into the meaning and purpose of education, has paid us the great compliment of coming to address a gathering of doctors and to give us the benefit of his wisdom.

It is also fitting that Professor Fulton, who has made the physiology of the brain his special study, should follow Sir Richard Livingstone and speak on his other special interest, that of medical history, telling us of the background of the theme of the conference under the title of "The History of Medical Education."

And then, several thousands of miles from New England, Colonel Mallick comes from Pakistan to speak on the parting of the ways between the medicine of this century and before that time. Is medicine a technology or a profession? And if the answer is clear, as I think it is, then how must we educate youth to respond to the challenge implicit in this conception of our common faith?

In preparing for any calling there are challenges from three directions. These are directed at the teachers, at those they teach, and at what they teach. These aspects therefore form the basis of three of the main sections for

the Conference, whilst the fourth, preventive and social medicine, reflects our enhanced consciousness of its importance and of its potentialities both in the medical profession and among the general public, including their elected representatives in the governments of the world.

Social medicine, not to be confused with socialist medicine, is indeed our main contact with the laity, since it covers a part of medicine which they can readily understand, and the execution of it, particularly from the financial angle, lies in their hands. In this field of medicine, too, the fundamental principles are the same in all parts of the world, whether the conditions be civilized or primitive.

Challenge to the Student

What is the challenge to the student? There are certain qualities essential to all students, from whatever part of the world they may derive. It is not difficult to draw a brief pen-picture of the ideal medical student; cultured, broadly educated in the humanities, intelligent and intellectual, of transparent integrity, humane and sympathetic, and, above all, one who will love his profession as well as his fellow men and all their weaknesses, their joys, and their sorrows.

It would be impossible for all students to attain such an ideal, but all should have some at least of these qualities, either inherent or capable of development, for I personally believe that unless this is so the man will never make a doctor, however well he is taught. Selection therefore becomes of importance, and will be a part of our discussion.

It is reasonable to suggest that the profession of medicine, being recruited from the upper one-third stratum of the normal distribution of intelligence, should be composed of something better than a high average. This view must necessarily be related to the demands of other professions and occupations, which likewise need to be recruited from the same stratum. Indeed, it may be necessary to survey the man-power available in relation to the number of doctors required by the various peoples, some countries being prosperous and urbanized, others prosperous and rural, many poor and underdeveloped.

In all countries it is important that the medical profession, while being technically competent, should also have such intellectual and social prestige and such unquestionable integrity as to command respect in the councils of the nation, the province, and the community. Medical students must be recruited on individual qualities and ability, quite independent of family, of personal fortune, of class or family distinction, save that a cultured philanthropic family tends to foster desirable qualities.

There can indeed be little doubt that the first challenge to medical education at this time is the challenge to education itself. Has the government of a particular country so ordered its educational system that a proportion of its youth will be fit to take up the most exacting profession in the world? If this is not the case, then the omission may need to be rectified at adult phase, perhaps in another country, otherwise there is little point in making fine or even coarse adjustments in the medical curriculum if the soil is not fit to receive the seed.

The Medical Teacher

Just as we think of the ideal medical student (though we ought really to think of the average, for this is the type with which our educational methods have to contend), so also we can picture the ideal medical teacher, whether he be teaching at the bedside, in the out-patient department, in the operating theatre, in the laboratory, in the lecture-room, or in the field.

Not all can attain the ideal, and it is not necessarily true, in fact often not so, that an expert in his subject can readily hand on his knowledge to others. Yet the expert and the artist can usually impart something which the professional

teacher cannot convey. There is, however, much to be said for the wide use of some form of tutorial system in the teaching of medicine. By this I do not mean what is generally implied by a medical tutorial—namely, question and answer in preparation for an examination. I think, instead, of the relatively young, experienced, keen member of a hospital staff to whom a small group of students can be permanently attached during the whole time of their hospital learning. The group could gather with the tutor, once or twice a week, from their several and different duties and discuss with him the doings and experiences of the week. Such a tutor, who might well be a general practitioner, could direct studies, review the work of the week, integrate and co-ordinate the various experiences, and give point and emphasis in such a review to all the aspects of medicine, social, hygienic, psychological, ecological, historical, and so on, which various advocates would especially wish to have inserted into an already overloaded medical curriculum. Such a tutor would indeed help to correct the departmental attitude which tends to over-emphasize a narrow subject. Good tutors are difficult to find, and they should not be overloaded with too many students, otherwise the personal atmosphere, that of a family rather than a tutorial class, would be destroyed.

Presentation is in many ways as important as what is presented. The classics, thought by many to be the ideal form of education, are worse than useless if presented to the student in a way which repels him.

The selection and appointment of future teachers might well be more deliberate than hitherto, in order that some may be chosen for their teaching capabilities; and such appointments in some grades might be for limited terms instead of for life.

What is to be Taught?

So much, then, for the medical student himself and his teacher. I must now take up the third challenge—namely, what is the student to be taught. From the narrow point of view one can argue endlessly whether this or that subject should be included in the curriculum and how many hours a week or a term should be devoted to it. With such an approach this conference would probably make little progress even if it were to confine its attention to the problems of the various medical schools and faculties in Britain.

Obviously the content of the curriculum is important, and during this week we shall learn a lot from each other with regard to it. Medical education, however, in any one area must to some extent be related to the medical needs of the population of that area. For example, the doctor practising in Britain will not need to be an expert in tropical medicine. Yet Britain's world-wide responsibilities in the Commonwealth have been reflected in the fundamental contribution made to the subject of tropical medicine by British workers. I need mention no more than Manson, Ross, Bruce, Leishman, and Leonard Rogers. This illustrates at least the fact that medical education can never be parochial.

The approach I have made with my programme committee has been to determine four principal sections and to select topics within these which will bring out and illuminate principles and methods. Let us just look for a moment at a few of the many things in which a medical student might be profitably instructed or of which he at least ought to have some knowledge. The complexity and variety of the subject arise from the enormous accumulation of knowledge during the past 50 years, and especially the last 25 years.

Nuclear physics, colloid science, and enzyme chemistry have provided us with new instruments of thought and practice. The bacteriologist has come to govern the surgeon in the operating theatre, the nurse in the ward, the cook in the kitchen, the practising doctor who uses antibiotics, and the public health worker who is concerned with community infections. The problems of blood transfusion, at one time seemingly simple, are now an affair of genetics,

specialized serology, and statistical analysis. Even clinical experience and a flair for diagnosis can no longer be regarded as infallible guides to ultimate clinical truth: the opinion needs to be checked by means of which the clinician may be profoundly ignorant. The clinician may indeed be momentarily embarrassed when asked for a quantitative expression of his observations and deductions. Medicine is coming to draw even more heavily on the more exact basic sciences and to become more precise and scientific in the formulation and execution of its tasks. It has been said that "science is measurement," and the medical statistician is now an indispensable member of the team which assesses the results of new remedies in a clinical trial or the efficacy of a new immunizing agent.

The challenge to our universities and medical schools is a simple one. Are we preparing our students at least to grasp the principles behind all this scientific work? Does the student leave the university with an understanding of the methods of science and with some knowledge of its history? The doctor of the future will have to be grounded more firmly in the basic sciences than was the student of 20 or 30 years ago, otherwise he will not be prepared to meet the challenge of advancing knowledge which is making medicine a more complete science. And here at once we come up against a difficulty. Because of the length and the ever-increasing complexity of medical studies university authorities ask that the boy at school shall have passed his first medical examination in the basic sciences of chemistry, physics, and biology before he enters the medical faculty. Parents, too, approve of this requirement because of the cost of medical education. The schoolmaster has had to bow the knee to this necessity. But there is evidence that there is now some poverty of mind in the finished medical and science graduates because of lack of general education in the humanities, literature, language, history, philosophy, and the arts. There is little doubt that the medical student who is to be a practising doctor should understand the world in which his patients live, and should be able to approach them as human beings with a depth of understanding that can come only from an appreciation of civilized values. We are indeed aware of the obvious dangers of too early specialization in science among those who are going to graduate in science and medicine. Perhaps the discussion between schoolmasters and doctors at the Conference will help to find an answer to this problem. Here, however, I would say that it is not advisable to extend the graduate period of education if it can be avoided.

It is also desirable, wherever possible, to preserve the continuity of education in school, university, and, indeed, in postgraduate studies. For example, the inorganic and organic chemistry at school should lead to extension of these subjects in the first medical examination and so to the biochemistry and physiological chemistry of the second medical examination, and thence to the application of these to the clinical work of the bedside in the form of chemical pathology. I shall listen with interest to hear whether speakers will state at which point in a student's education at school and university a medical orientation should be given, for example, to the teaching of chemistry.

From the undergraduate standpoint the depth to which the subject should be taught also presents a problem. How much chemistry? How much physics? How much anatomy? Does the intending and practising doctor need to memorize in detail, and then forget, the three-dimensional relations of the posterior triangle of the neck? Does he need to learn the dosage in Röntgen units of the radiation treatment of carcinoma of the cervix? Does he learn anything, as a student, when spending hours in an operating theatre watching the surgeon remove a tumour of the brain? Could he not spend his time more profitably in the out-patient department, the casualty reception, the polyclinic, or even in an art gallery or on the football field?

Sometimes a subject may become a burden in a particular medical school because of a struggle to maintain a department in a prominent position. I myself believe that a student

should receive continuous and lengthy instruction only in the common and basic and useful and everyday clinical problems, but he should content himself with a single experience in rare or specialized procedures. The brain operation which I have quoted will serve as an example, and likewise with the highly specialist work of the ophthalmic and other departments. On the other hand, more experience in such special departments as dermatology would be repaid in the field of actual practice.

Only by discussing such views and exchanging ideas shall we eventually find out how to unload the medical curriculum to make room for new subjects and how to give more attention to parts of training that have been neglected or should receive a fresh emphasis.

I should like once again to emphasize the need for continuity of teaching and how important it is to avoid presenting the student with separate blocks of instruction, the one block being unrelated to the other except in terms of successive examinations which have to be passed. The student must never think of the various phases of his education as a vista of obstacles between him and his final qualification, to be overcome as soon as possible and, once overcome, to be forgotten.

Integration of Medicine

Some of the themes for discussion this week remind me of one of my most distinguished predecessors at Cambridge, Sir Clifford Allbutt, who protested eloquently and with learning against the separation of medicine and surgery, a separation for which physicians are much to blame. Likewise many now hold the view that physiology and anatomy should be integrated as a single basic subject in the curriculum. We do not now need to train the nineteenth-century prosector. He can train himself after he has qualified.

Integration is indeed a fundamental requirement in the curriculum. Teaching has grown up piecemeal. Some aspects are mere survivals which have long lost their relative importance; others, of modern conception, have not been fully appreciated or orientated. Someone might well attempt to write a reasonably short textbook giving the principles governing the integration of all the many facets of medicine. If all the bees could be collected in one bonnet we should indeed have made progress. Happily the clinician in the wards is now accustomed to welcome to the bedside the physiologist, the pathologist, the radiologist, and, especially, the general practitioner.

I feel sure myself that the properly chosen medical tutor could contribute so very much to real integration and do away with both piecemeal instruction as well as the danger of disproportionate departmental and sectional emphasis.

Preventive and Social Medicine

This country's experiment with a National Health Service is one manifestation of the view that medicine is also a social science. The illness of one person is not an isolated event having no effect on others. Tuberculosis is not caused only by the tubercle bacillus. Housing, nutrition, conditions of life and work, all play their part, whilst in the chain of recovery the physician, the surgeon, the pathologist, the radiologist, the sanatorium, the public health officer, and the social worker in the home and in industry are all involved.

The study of man in relation to his environment, human ecology, is the fundamental basis of what is now called social medicine. The challenge to medical education to meet this growing consciousness of the importance of social medicine comes from within as well as from without the medical profession.

A complete section of this conference is concerned with the teaching of preventive and social medicine, a subject in which the World Health Organization takes a special interest. Thus, there will be opportunities for educationists from all parts of the world to exchange ideas and experiences. And it is to be hoped that what is said will help those responsible for medical education in countries where facilities are less

highly developed, especially, perhaps, in the fields of social and preventive medicine.

The Objective of Medical Education

Whatever be taught to the student, it is as well at some phase to ask ourselves coldly and critically, What is the object of undergraduate medical education? The short and incomplete answer is to turn out someone fundamentally equipped to be a practising doctor. The period of training should not be specifically directed towards the training of a general practitioner or a specialist or a public health official or an administrator, but should provide the student with a foundation for his after-career in any branch of medicine. It is his postgraduation apprenticeship and narrower studies which finally complete his early education in the branch of medicine he elects to follow, whether this be general practice or a specialized field.

The undergraduate teacher should aim at producing an educated person grounded in principle and method, able to see what the whole of medicine stands for and means, trained to observe with his hands and his senses, encouraged to think logically and critically, instructed in the use of the instruments of measurement, and equipped with a basic knowledge upon which he will continue to build for the rest of his professional life.

Are we as medical teachers doing this? Or is teaching just a by-product of our professional life? Do we positively examine ourselves from time to time with a critical eye, or do we complacently content ourselves with no more than getting the student over an examination hurdle?

Are we also satisfied with the means by which a student's competence to be qualified is assessed? Has the examination a hampering effect on what is taught and learned, and, if so, can we suggest any alternatives? Always we have to bear in mind that in many countries the manner of assessing competence and the standard are governed by law. There is, however, little doubt that experiment would show some ways in which the perpetual orthodox examinations could be advantageously modified.

Those of us who had the task of devising the programme for this Conference had to pack a great deal into the short space of a week. Many themes I should like to have heard discussed have had to be omitted. Many here might have made different choices. All of you will, I hope, by the end of this week conclude that we have made a useful beginning in tackling this most fundamental of all medical questions—education. And if that is the conclusion, I hope that, individually and collectively, you may decide that the organizations which you represent might be asked to repeat the Conference in four or five years if it is felt that that would carry the matter further.

In the meanwhile what likelihood is there that something will be done? That those in control of medical education will really have the humility and courage to admit that all is not at its best in the best of all possible worlds, their worlds? That those who hold the shaping of the future in their hands will fashion it with vision and imagination so as to inspire the young man and woman to pursue the tasks of our great profession with a feeling of dedication to something greater than themselves? There is indeed a likelihood, otherwise so many of us would not have met here in London in the month of August. But the possibilities must be turned into probabilities and certainties, and until this happens we must possess our souls with that discontent that has so aptly been called divine.

We may aim higher than we can reach. But if we aim high we shall at least reach somewhere. Our individual and collective responsibility as a profession grows, and will grow. We cannot escape it. Medicine to-day demands much from character, intellect, and practical ability, and medicine also provides a wide variety of opportunity for all kinds of talent. But talents will be wasted or misused if the structure and content of medical education are faulty, and if medical educationists remain complacently satisfied with themselves and their methods.

WHAT IS EDUCATION?*

BY

Sir RICHARD LIVINGSTONE, M.A., Hon.D.Litt.,
Hon.LL.D.

We have—most of us—to earn a livelihood. We find ourselves on an immense stage called the universe, occupied by strange creatures called men, and we must have enough knowledge of this scene and of its inhabitants to play our parts intelligently. And we are human beings, with a body, a mind, and also something elusive and indescribable but very real, which we call a soul or spirit—three elements which combine in our personality and which interact on each other; and we wish to make the best of all of them, so far as our natural endowments allow. For even if there were no Great Assize before which at the end we shall be summoned to say what we have done with ourselves and our talents, the world will judge us; and, what is more disquieting, in moments of insight and reflection we shall judge ourselves.

These three needs determine the aims of education. It should prepare us, either by a general or a vocational training, to earn our bread; it should give us some understanding of the universe and of men; and it should help us to become fully developed human beings. Of these three aims the vocational one which concerns us as breadwinners is least likely to be overlooked; and I shall therefore say nothing about it, but concentrate on the other two aims—the making of intelligent citizens of the world and of good human beings—*homines maxime homines*. These two are the most important to us as men, but, since they are the less obvious and the more difficult, they may be neglected, and especially the last of them. Yet the human being is a work of art, capable of a quality and beauty of its own, quite apart from any practical purposes to which its powers are put.

Science an Essential Part of Education

We have to live in a material universe inhabited by men, and to live intelligently we must know something of both. The keys to a knowledge of the material world are commonly called (not very happily) science, and so some knowledge of it is an essential part of education. But in planning our curriculum we should distinguish between scientists, doctors, engineers, and others, who require exact knowledge of science in their occupation, and those who do not. For the needs of these two classes are not the same. The former class must have specialist knowledge of the sciences which they require for their life's work. The need of the others is different. It is less important to teach them chemistry or physics or biology than to give them an idea of the meaning of the changes that came in human affairs about 600 B.C., when some Greeks realized that there was more in the universe than the senses could perceive, and began looking beneath the surface of phenomena to underlying realities and laws, and science was born: and, again, when in a later day other men conceived that through such knowledge nature could be controlled as well as understood, and science gave birth to her child, technology.

To realize the meaning of science, her powers and procedures, the instruments of observation and experiment by which she works—that is more important than teaching individual sciences to pupils who are not going to specialize in science—it is, of course, only of them that I am speaking. By all means add to this essential core as much as

*An address given in the plenary session of the First World Conference on Medical Education on August 24.

time permits. But I can see no use in being taught, as I was, the elements of chemistry and physics without ever having an idea of their meaning and use, or any conception of the fascinating truth that you can transform things by analysing them into their constituent elements. The teaching I had did not make me less of a stranger in the material universe than I was before. It only gave me a transitory knowledge of some isolated facts in which I saw no meaning.

Science, then, though in different forms, must have a place in all education, for the material universe is the stage on which the human drama is played. We say, no doubt, that man is not the centre of the universe, but, however true that may be, everyone continues to act much as if he was; if we did not think our activities of great importance we should cease to take them seriously. But the drama is human and the actors are men, and the actor is more important and interesting than the stage. His fortunes are, in practice if not in theory, the fortunes of our world, and apart from them it would have lost any meaning. Man is the source of ideas and ideals, the deviser of progress and its instrument, the maker of that rich and ingenious structure which we call civilization. As Shakespeare put it, "What a piece of work is a man. How noble in reason! how infinite in faculty! . . . in action how like an angel! in apprehension how like a god! the beauty of the world! the paragon of animals!" That is man in his better moments; he has other moments too. Anyhow, in himself he is a fascinating study, and without some study of him we shall not live our lives with intelligence, interest, or, in any but the narrowest sense, success. That is why Dr. Conant, himself a distinguished chemist, said that "in terms of general education, poetry and philosophy are of vastly more importance than science"; so history and literature must enter into any education; for they are our chief records of man and his ways.

Place of History and Literature

In history we see his slow ascent from savagery to a complicated civilization, his experiments, mistakes, failures and successes in the climb, the states he has founded, static or progressive, transitory or stable, the forces that have brought him on or kept him back, the virtues that have sustained his efforts, the vices that have brought them to nothing. History is a clinical study of man in society. Literature is more personal. Here we meet man in his intimate moments, talking to the world, but really to himself, so that in literature are recorded all the thoughts, feelings, passions, visions, and dreams that have ever passed through the human mind; and some of the visions play a great part in human progress. In one way literature is less instructive than history, because history has to do with facts, and poetry with visions; in another way more so, just because it is more intimate, more personal. We meet human nature in undress, we meet ourselves, but also we are taken beyond ourselves to an exceeding high mountain and shown all the kingdom of man and the glory of it. Religion first, but close after it poetry, reveal powers and qualities in man which otherwise we should not know. Lifted on the shoulders of genius, we catch a glimpse of undivined worlds which are within the reach of the human spirit.

The Right Aim

But, you may reasonably ask, is this the way in which literature and history are taught in schools, or even in universities; is this the light in which they are presented to the pupil; and do not many people study them without any clear idea what they are about? I will not answer these delicate questions, but they remind us of an important fact. It has been said that it does not matter what subject you teach a pupil, if you teach it well. I would add (though neither of these epigrams is quite true) that it is

¹ Education in a Divided World, p. 126.

no use teaching anything if you teach it badly. And not only must a subject be taught well it must be taught appropriately. I argued earlier that it is a mistake to teach science to an arts specialist in exactly the same way as you would teach it to someone whose main study it is. I do not think that this mistake is now often made in teaching science to those who will never specialize in it. But it is, I fancy, sometimes made in teaching literature and history to scientists. The right aim in teaching these subjects to those whose work and interests are in science is less to instruct them than to awake the mind, to make the pupil feel the interest of literature and history, even though his detailed knowledge of them may be small. I would rather that a boy had read one dialogue of Plato, one canto of Dante, one play of Shakespeare or Racine with real enjoyment, and with a keen sense of its greatness, than that he should be hurried through masses of literature which he neither understands nor enjoys nor absorbs. If he is interested, he is likely to pursue the study further in his leisure; and he will at least have become aware that there are more things in heaven and earth than are dreamt of in his specialism. By all means add to this stimulus as much knowledge, as wide a survey, of history and literature as you have time for: but without the stimulus these are vain. General culture is designed, as Whitehead said, "to foster an activity of mind."

Four Points

So far I have been talking about the introduction to the kingdoms of nature and of man—a preparation to feeling at home and living intelligently on the stage where we find ourselves. But we also need some instruction about how to behave there, and I shall mention briefly four points of good behaviour. One point is to learn how to express ourselves intelligibly to others. A second point is to know how to read a book, noting exactly what it says. A third point is to think clearly and logically. John Morley said that an educated man knew when a thing was proved and that an uneducated man did not know; and this saying, though not an exhaustive account of education, calls attention to an essential element in it.

Logical thinking is one way to truth, but it is not the only road, nor is it a complete one, and so I should add to my proposed code of behaviour a fourth item—the insight that comes from sensitiveness—to supplement and correct the knowledge which comes from hard thinking. This is often neglected in our education. The sensitive person with an undisciplined mind is a danger; so, less obviously, is the mere intellectual. He is not likely to be good at what has been described as the sacred duty of getting under other people's skins—especially the skins of people unlike himself. Some human beings are born with the sensitiveness that makes this easy and habitual. But it is a gift that can be trained, and the best training in it is given by two subjects that find a place in any curriculum—history and literature, especially literature, where the reader enters into the mood of the writer, the atmosphere of the poem, the temperament of the character described. Take for instance Shakespeare's *Othello*. Except for the pleasure which the rich language gives, one might just as well not read it if one does not for the moment creep under the skin of the Moor, of Desdemona—yes, and of Iago—and feel as they feel in the play. Of course literature has the power of absorbing us in bad, as well as good, moods and atmospheres; that is the reason why Plato thought it dangerous. But a training in sensibility and the insights which sensibility gives is essential. For knowledge is not merely the collection of facts; it depends on imagination as well as on reason.

An Overruling Principle

So far I have suggested that the aim of education is at least to introduce us to the worlds of Nature and of Man, and to train the powers of reason and imagination and the art of expression needed for effective behaviour in them.

But that is not enough. It would be possible to have all these and yet be without that overruling principle which we call a philosophy of life; a force to steady the purpose and give it direction, to concentrate the abilities and bring them to bear, to recall and revive the flagging energies; a force which is

Victory and law
When empty terrors overawe;
From vain temptations doth set free
And calm the weary strife of frail humanity.

An education is incomplete unless it leaves people with what I have called a philosophy of life, and never was this more needed than in our age of uncertainty. But the very conditions which make it desirable make it difficult. Order is not easily visible in chaos, nor a clear voice audible in a confusion of tongues. The Christian no doubt has firm beliefs and clear standards, and my own conviction is that Christianity will become again the philosophy of the Western world; but that day is not yet. Meanwhile can we find an interim philosophy which can be imparted through education and which is sufficiently powerful to dominate men's minds and hearts, sufficiently convincing to win a general assent? It is not easy to see one. What philosophy of life—to take an obvious instance—can the Western and the Russian blocs share? There is only one creed which men in every continent agree to repeat: "I believe in Science and in its child Technology." That is a starting-point; it is something. But it only covers a limited area of conduct, and it does not profess to answer the most important questions about life and human nature. You cannot call it a philosophy. A principle of wider range is needed.

Philosophy of the First-rate

There is a philosophy which gives standards of value and judgment that apply to all spheres and activities of human life. It is a very simple one, and no one would reject it. I would call it the Philosophy of the First-rate. Ask a doctor or a surgeon if he is ignorant of or indifferent to the best methods in his profession. Would he answer yes? Or would he consider that there are no differences of quality in art, literature, music, architecture, and that it does not matter whether a picture or a sonata or a play or a building is first-rate or third-rate? Or, taking the inquiry into a still more important province, do we think that when we apply the words good or bad to human character and conduct we are drawing meaningless and unimportant distinctions? In all fields of life all people, whatever their creed or race, admit what I called the philosophy of the first-rate. I have already quoted John Morley's saying that an educated man knew when a thing was proved and that an uneducated man did not know. I would prefer to say that an educated man knows, and an uneducated man does not know, what is first-rate, and that the best-educated man is he who knows the first-rate in the most important human activities.

The supremacy of the first-rate is a self-evident axiom. But it is sometimes an unrealized axiom. We are like the slave in the *Meno*, who had the principles of geometry latent in his mind, but never recognized them till Socrates played the midwife and brought his subconscious knowledge to the birth. For our purpose education must be the midwife—the metaphor suggests one of the most fruitful and fundamental conceptions in that field—and bring to birth this philosophy of the first-rate, which is so fruitful and which no human being would disown.

But how do you know the first-rate? How do you recognize it in practice? There is only one way of getting to know it—by seeing it; and that is the way in which it can be taught. I imagine that the medical student will learn more by seeing a great surgeon at work or by going round the wards with a great doctor than all the textbooks in the world can teach him. It is the same in anything. People learn what is first-rate by contact with it. You learn what is great music by hearing it, what is great architecture

by seeing it. You learn first-rate business methods by working in a first-rate business firm. It is the same everywhere. You acquire a good taste in wine by drinking good wine, in good cigars by smoking them.

In cigars and wine, if we have the money, in art and music, even if we have not, it is easy to come across the first-rate. But where do we find it in character and life? It is at hand; in the great religions, and the great moral systems, but also in literature and history, though here the pure gold runs in veins amid much worthless matter. Make, for instance, a list of the good men and women in Shakespeare's plays, and what a company of noble characters you will assemble. Here, and throughout the literatures and the history of every country, archetypes of excellence are present for the looking. These are the great sources on which we can draw, and here is one reason why an education which ignores the humanities is disastrously incomplete. I do not of course suggest that the study of history and literature is only the study of human ideals, conduct, and character. Obviously these subjects have many other aspects. But it is with this aspect of them that we are concerned at the moment. Therefore, for our particular purpose, history and literature must be read from this angle and with this aim in view. Unfortunately this is often ignored in the teaching of history and even of literature. Their teachers have usually been trained as experts by experts, and are interested in those other aspects of the subject with which universities concern themselves, but which, necessary and important as they are, are of no use for our particular purpose. For that, history and literature must be treated as mirrors of human character, and indeed as moral philosophy in the concrete.

But, you may ask, how do you know what is first-rate in literature and art, and still more in human character? As Browning puts it,

Ten men love what I hate,
Shun what I follow, slight what I receive,
Ten, who in ears and eyes
Match me: we all surmise
They this thing, and I that: whom shall my soul believe?

That is a plausible question, but more embarrassing in dialectic than in fact. There is no real doubt that Homer and Shakespeare are great poets, Bach and Beethoven great musicians, Plato and Kant great thinkers, Newton and Faraday great men of science. Even in the more uncertain field of character and conduct no one is likely to doubt that in St. Francis or the Buddha, in Lincoln and Masaryk, we see the first-rate. We are safe in accepting the judgment of time; it is rarely reversed on appeal.

To repeat, an education which leaves us without a philosophy of life is as incomplete as one which leaves us unable to think or to express our thoughts. And never was a philosophy as necessary as in an age of divided purposes and paralysing doubts about ultimate ends. Our civilization is fluid, its future form still to seek and make. At present it is a curate's egg civilization—some of it excellent, some of it fourth-rate. If you question this criticism, look at our cheap daily papers. Yet ours is an age of great vitality, of unlimited powers and possibilities, too often frittered away or misused. We have the materials of a great civilization: all that is needed is to stamp it with the print of excellence. The more reason that our education should train our youth to desire, recognize, and pursue the first-rate.

According to a press report, a public opinion poll organized by the psychology department of Victoria University College, Wellington, New Zealand, showed that the social status of doctors was put higher than that of the other professions and occupations. After the doctors came lawyers, company directors, business managers, nonconformist clergy, accountants, chiefs of Civil Service departments, works managers, farmers, and teachers, in that order.

HISTORY OF MEDICAL EDUCATION*

BY

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"From the earliest times, medicine has been a curious blend of superstition, empiricism, and that kind of sagacious observation which is the stuff out of which ultimately science is made. Of these three strands—superstition, empiricism, and observation—medicine was constituted in the days of the priest-physicians of Egypt and Babylonia; of the same three strands it is still composed. The proportions have, however, varied significantly; an increasingly alert and determined effort, running through the ages, has endeavoured to expel superstition, to narrow the range of empiricism, and to enlarge, refine, and systematize the scope of observation. . . . The general trend of medicine has been away from magic and empiricism and in the direction of rationality. . . ." (Flexner, 1925).

The quotation above is from Abraham Flexner's well-known monograph on medical education, and I repeat it here because it expresses so succinctly the broad sweep of medicine from its beginnings to the present day, when the teaching of the art is of sufficient import to bring together at this World Conference men who are concerned with all its phases and implications. From the days of the early priest-physicians the teaching of medicine has had a highly personal flavour, and this close physician-pupil relationship has persisted until modern times, varying in degree as times have changed, but never altogether disappearing. There are many in this era who lament the fact that the personal tie between teacher and pupil no longer plays so vital a part in medical education, and they would urge a return to the earlier mode of teaching.

Ancient Precepts

In early Sanskrit medical literature there emerges through the mists of Hindu legend an eminent physician named Charaka, who, like Hippocrates, was a great teacher and an indefatigable writer (Puschmann,† 1889; Jelliffe, 1906). In his commentaries on the *Ayurveda* (c. 500 B.C.) he admonishes young men who propose to study medicine to find a good teacher—one "whose precepts are sound, whose practical skill is widely approved, who is clever, dextrous, upright, and blameless; one who knows also how to use his hands, has the requisite instruments and all his senses about him, is confident with simple cases and sure of his treatment in those which are difficult; of genuine learning, unaffected, not morose or passionate, and who is likewise patient and kind to his pupils" (Lakshmi Pathi, 1944). This is one of the earliest statements of the pupil-teacher relationship in the literature of medicine, but no doubt there were many other great teacher-physicians in China, Egypt, and among the Jews whose views about the training of students have not survived.

The medical literature of Greece and Rome, however, gives detailed insight into both the principles and the practice of student education; here the source materials become

*An address given in the plenary session of the First World Conference on Medical Education on August 24.

†In tracing the early history of medical education one inevitably turns to Theodor Puschmann's scholarly treatise, published at Leipzig in 1889, *Geschichte des medizinischen Unterrichts von den ältesten Zeiten bis zur Gegenwart*. In 1891 Evan H. Hare, F.R.C.S., gave an admirable English rendering under the title, *A History of Medical Education from the Most Remote to the Most Recent Times*.

vast (Drabkin, 1944),‡ for the Greeks were much concerned with education and wrote of it at length. In the period before Hippocrates, Greek traditions had begun to spread westward. Thus in the fifth century B.C. a medical school was already established at Croton, in southernmost Italy (on the instep of the Italian boot facing North Africa). Here flourished another figure, Alcmaeon, who, like Charaka, is known nebulously through the writings of others. From Theophrastus it is learned that Alcmaeon was a neurophysiologist—the first of whom there is record. Theophrastus states that he carried out experiments on the brain and spinal cord of living animals and that he distinguished between sensory and motor nerves; indeed, some believe that he had even grasped the concept of the reflex. Alcmaeon is said to have attracted many students and to have carried out anatomical dissection and demonstration (Stella, 1939).

Throughout the Greek world, medical education was based more on experience than on book learning, practical training generally being acquired from a physician-father, or by an aspiring student apprenticing himself to a practitioner for a period of years. Books were used, but only as adjuncts, and they never replaced practical experience. There is an interesting passage in the *Laws* of Plato in which distinction is made between the training of free doctors and those who are merely to become their assistants. "All bear the name [of physicians]," he wrote, "whether freemen, or slaves who gain their professional knowledge by watching their masters and obeying their directions in empiric fashion, not in the scientific way in which freemen learn their art and teach it to their pupil" (Taylor, 1934; *Laws*, 720).

The spirit of the student-teacher relationship is also well exemplified in the Hippocratic Oath: "To hold him who has taught me this art as equal to my parents and to live my life in partnership with him, and if he is in need of money to give him a share of mine, and to regard his offspring as equal to my brothers in male lineage and to teach them this art—if they desire to learn it—without fee and covenant. . . ." The Oath also distinguishes between general precepts and practical instruction, such as that derived from attending a physician on his rounds and observing and helping in the temple where he sees his patients.§

The apprenticeship system spread to Rome and persisted there long after formal schools of medicine with regular course work had been established. According to Galen, anatomical dissections were sometimes carried out by students in early childhood under the direction of a father-physician. Galen adds significantly that when childhood dissection was given up it became necessary to have written manuals of instruction (Drabkin, 1944), which led to a gradual standardization of medical instruction throughout the Roman world and the establishment of medical schools offering lectures and obligatory dissections (usually on animals), sometimes carried out by the student himself, but more usually by a teacher or demonstrator. During this time there was a gradual separation of medical theory and practice, and little by little instruction in surgery became divorced from that of medicine.

Both in Greek and in Roman medicine great emphasis came to be placed on the scientific approaches. As Sir Richard Livingstone (1944) has said so eloquently, "Science

‡Drabkin (p. 350) points out that, while more in the way of medical writings have come down to us than in that of any other field of ancient literature, the greatest part of medical literature as such has failed to survive. No attempt can be made to estimate how many thousands of books have been lost, but Drabkin cites one instance of an unnamed doctor who wrote 256 books and not a fragment of any one of them survives. All of which points to caution in any type of historical reconstruction such as that of early medical education.

§The age of the Oath has been disputed, some having maintained that it probably antedates Hippocrates himself—i.e., sixth century B.C. (Puschmann, 1889)—but Edelstein (1943) believes that it comes from the fourth or fifth century B.C.

profoundly affected Greek thought but did not alter the conditions of Greek life, and we have the spectacle, so strange to us, of men profoundly interested in it but almost unaware of its practical uses. To the Athenian thinker—a fact curiously overlooked in much classical English education—scientific study was essential to the educated life. . . . Half of Aristotle's writings are on the same subject (science); and every Greek philosophic system, except Cynicism, has its physics as well as its ethics."

Mediaeval Times

The first school of medicine of mediaeval times came into existence, probably in the ninth century, on the shores of the Tyrrhenian Sea, in the town of Salerno. Tradition has it that the school was founded by representatives of the four cultural forces which had persisted through the Middle Ages—a Greek, a Latin, a Jew, and an Arab. Few traces now remain of this once flourishing centre of medical thought; however, its published texts, such as the *Regimen of Health (Regimen Sanitatis Salernitanum)*, bear eloquent testimony to the virility of a great school of learning. Prominent patients, as well as innumerable students, came to Salerno from far and wide, even from as far north as Germany and Denmark. One student, Gilles de Corbier, from Paris (c. 1200), returned to become private physician to King Philippe Auguste, and it was Gilles among others who proclaimed with tongue and pen the fame of Salernian medicine.

Some details are known about the mode of teaching at Salerno. In anatomy, for example, students dissected various animals, including pigs and monkeys, and they likewise attended formal demonstrations. Although much disputed, tradition holds that Salerno was the first school to admit women for medical training, and there are still those who believe that the author of the celebrated mediaeval treatise on diseases of women, *Trotula*,* was one of its graduates. "Mythoclasts" of the Sudhoff school—as Osler called them—have ungallantly tried to deprive Trotula both of her sex and of her position in history, but the late H. P. Bayon (1940) has found evidence in extant Trotula manuscripts that a thirteenth-century author bearing the name of "Trotula" clearly existed and that almost certainly she was a woman; but Dr. Bayon was not prepared to proclaim her the first female professor in a modern university.

While Salerno was developing its traditions of medical teaching, in far-away China, during the Sung dynasty (960–1280 A.D.), when Korea was first invaded, the position of court physician became stabilized, and to him was given the task of instructing students in the canonical books of medicine. During the Mongol dynasty (1280–1368), the Emperor Khublai introduced medical examinations and a system of licensure based on examinations, while in the Ming dynasty (1368–1644)—when Korea was again invaded—the Medical College of Peiping was founded, the first medical school in China (Castiglioni, 1947, p. 106).

By the twelfth century, in Europe, men trained at Salerno began to found schools elsewhere—in France, Spain, Portugal, and England; the earliest were those of Paris and Montpellier. The exact time of founding of these schools is in no case clear, but we know that Adalbert of Mayence studied medicine at Montpellier in 1137.†

There were three outstanding teachers connected with Montpellier—Arnold of Villanova, Henri de Mondeville, and Guy de Chauliac. Since Montpellier was situated near the Spanish border the receding tide of the eighth-century

**Curandarum Aegritudinum muliebrium ante, in et post partum liber unicus*; known also by its subtitle, *Passionibus mulierum curandarum*. The text was first printed in 1544 by Schottus of Strassburg, but the later text, published by the Aldines in 1547, is the one usually followed. An English translation by Elizabeth Mason-Hohl was published in 1940 under the title, *The Diseases of Women by Trotula of Salerno* (Ward Ritchie Press, California).

†In addition to following the example of Salerno in the teaching of anatomy and surgery, Paris and Montpellier also stressed medical botany; thus the French physician Odo Merndon (c. 1130) probably wrote the famous poem *De viribus herbarum* in two thousand Latin hexameters (generally attributed to Macer Floridus), and there were many other writings in the field of medical botany dating from this period.

Arab invasion had left its mark in this part of France, and it was inevitable that the teachings of these physicians would show a strong Arabic influence. Arnold of Villanova was well travelled and widely read, and he was one of the most prolific writers of the Middle Ages. Henry de Mondeville, also dominated by Arabic influence, was an excellent practical surgeon whose success was in no small part due to the fact that he was a keen observer. The most influential of the Montpellier trio was undoubtedly Guy de Chauliac, whose textbook of surgery, one of the most important of the late Middle Ages, was reprinted far into the seventeenth century and often in vernacular tongues. Both Mondeville and Guy de Chauliac were practical men who appreciated the value of training their hands both for diagnosis and for the operations of surgery, but too little is known about their actual teaching methods to warrant more detailed consideration here.

A contemporary of these men who was earning an equally distinguished reputation as a writer and teacher was Peter of Abano, who was one of the first of the great physicians of the school of Padua. Sir William Osler (1921) points out that 8 of the 182 medical books printed before 1481 were from his pen, and from this we can judge his influence not only upon his contemporaries but on the history of medicine. Medicine of the Middle Ages was of course closely aligned with theology, and, since the clergy were the most learned men of the time, two of these must be mentioned in passing for the tremendous influence they exerted in turning men's minds towards scientific approaches to the facts of nature. The first was Albertus Magnus, who so magnificently interpreted Aristotle to his generation; the second Roger Bacon. Albertus Magnus was a man of encyclopaedic learning whose paraphrase of the natural history of Aristotle became the basis for all subsequent Aristotelian studies. His medical works were also widely known, and, while he inspired many, his greatest pupil was Thomas Aquinas.

Roger Bacon was one of the first to lay stress on the importance of acquiring knowledge through original research rather than from existing authorities, but his contemporaries had little appreciation of his practical philosophy, and he himself lacked the ability to put his teaching into practice. The result is that readers of to-day find a refreshing modernity in his writing.

The Renaissance and After

The fifteenth century marks the renaissance of the great Italian schools, especially those of Padua, Bologna, Ferrara, and Pisa. In the following century students went over the Alps in great numbers, and in each university formed themselves into "nations"; thus we find Fabricius of Aquapendente dedicating his celebrated treatise on the valves in the veins to the "German nation"—confusing indeed if one did not know that he was addressing himself to a particular group of attentive students who had seen him demonstrate, even as had William Harvey, these important venous structures, which ultimately led Harvey to the discovery of the circulation.

Many of the practising physicians in England during the fourteenth and fifteenth centuries had studied medicine in the good Continental universities—Padua being the most popular until the religious difficulties of the late sixteenth and early seventeenth centuries caused English students to turn to the Protestant schools of Switzerland and Holland, especially Leyden, where Boerhaave's medical clinic had become celebrated. It is true that "physic" was taught at Oxford and Cambridge, but instruction was usually theoretical and success involved gaining a verbatim knowledge of ancient writers, such as Galen and Hippocrates and a number of the Salernian texts. The popularity of the Continental schools was such that Parliament made into a law in 1421 a petition from the English universities that graduates of foreign schools must become "incorporated," with an M.D. either from Oxford or Cambridge before they could practise medicine. This ultimately became a routine procedure (Allen, 1946).

During the next century the need for a system of licensure became increasingly apparent, and in 1518 Thomas Linacre,

who had studied in Italy (for 12 years), founded the Royal College of Physicians under charter from Henry VIII. Recognizing the need also for medical chairs, Linacre established three medical lectureships—two at Oxford, one at Cambridge—and in due time the first two of these lectureships became the Regius Chairs of Medicine at Oxford and Cambridge. Linacre's second lectureship at Oxford bore his own name and still survives (Chaplin, 1919).

Another prominent advocate of a more modern approach to medicine was Linacre's near contemporary, John Caius, who had brought back from Padua the teachings of Vesalius. As Master of Gonville College he endowed three fellowships—two for medicine—and twenty scholarships, and Gonville and Caius College, as it later was to be known, came to be the centre of medical study at Cambridge.

Period of Transition—1600–1800

As the "New Learning" of the sixteenth century transformed scholarship in the western world, so the "Experimental Philosophy" of the seventeenth gave new life both to medicine and to science. Bacon had set the stage in his *Advancement of Learning*, and Harvey, a short time later, became the centre of that stage through his monumental discovery of the circulation; but the full meaning of the Harveyan discovery for medical science and teaching was not fully appreciated until later in the century, after the Royal Society and the other scientific academies in Europe had been founded. Then came two remarkable figures, both Englishmen, who left their distinctive mark on medical education—the one in theory, the other in practice. To quote Sir George Newman (1918, p. 21):

"Locke and Sydenham . . . taught that, over and above the university spirit and a university standard of learning, the medical student requires (i) a training in observation and the inductive method, (ii) exercise and practice in his craft, and (iii) some apprehension of the rationale and laws and limitations of Medicine. His dormant faculty of observation will be awakened in his preliminary study of science, and indeed all through his medical curriculum it can be trained and stimulated to become a talent and a habit of keen, serious, patient, continuous seeking, of honest perceiving and of valid reasoning. The student must also have ample opportunity of everyday practice. Medicine is the art of healing not less than the science of disease. 'Our art,' wrote Sydenham to Dr. Mapletoft, 'is not to be better learned than by its exercise and use'—not an exercise of healing only in the sense of curing a particular patient, but of learning from each patient increased power in the art of healing all similar patients."

In England at the beginning of the eighteenth century a medical education could be secured only in London, Edinburgh, Aberdeen, and Dublin (Chaplin, 1919, p. 17). There were seven of the London hospitals in which a general knowledge of medicine could be obtained, but, except at the London, Guy's, and St. Thomas's Hospitals, formal teaching was much neglected. By far the larger number of students were educated at schools supported by private enterprise. Best known were those maintained by Dr. George Fordyce at his house in Essex Street, Strand, and at Windmill Street, where the two Hunters, Hewson, Cruikshank, Baillie, and Wilson combined forces. Attendance for a period of time at the lectures of men such as these enabled an aspiring surgeon to present himself for examination to the Corporation of Surgeons or the Worshipful Society of Apothecaries and, if successful, to receive a diploma. To prepare as a physician, on the other hand, involved a much longer course of study. The student must have a degree from some university, and, if he wished to practise in London, must pass the licentiate examination of the College of Physicians. This was obligatory for all physicians who wished to practise in the provinces, except graduates of Oxford and Cambridge. To qualify as a licentiate a candidate, according to Chaplin (1919), had not only to prove himself familiar with the principles of medicine but also to exhibit some general "erudition and culture." (See also Chaplin, 1920.)

In the early nineteenth century students began to find their way more often to the French schools, where Corvisart,

Laennec, and Louis were the harbingers of modern medicine. Louis in particular, with his statistical approach to medical problems, exerted a strong influence on many young men from America, who were to return and become the medical educators of that time. Later in the century it was Germany which attracted some of the best of the younger minds, for it was in Germany that practical laboratory teaching was first established within the universities. In these laboratories the sciences of chemistry, physics, pathology, physiology, and eventually bacteriology reached a mature status through the efforts of men such as Liebig, Helmholtz, Virchow, Müller, Cohnheim, and Ludwig (Fulton, 1950).

Developments in North America

Medical education in America was of course strongly influenced by both the French and the German systems of teaching, but the earliest influences stemmed from Edinburgh and London. The apprentice system which obtained in America from the beginning had been brought from England, with all its virtues and shortcomings. The inadequacies of the system were soon recognized by the enlightened physicians of the Colonies, and in the eighteenth century the more ambitious of those wishing to enter the profession of medicine made the hazardous journey to Edinburgh, London, Paris, or Leyden to complete their training. One of these, William Shippen the younger, returned to his native Philadelphia after a sojourn of five years abroad and began a series of lectures in mid-wifery and later in anatomy (Flexner, 1910). When his friend and fellow student, John Morgan, returned from his study abroad, he, Morgan, carried into effect the plans they had made together in Edinburgh—to found a medical school at the College of Philadelphia.

In an address delivered at the graduation exercises of the College in 1765 he proposed the creation of a professorship in the theory and practice of medicine. This celebrated discourse, still pertinent to-day, was entitled: *A discourse upon the institution of medical schools in America; delivered at a public anniversary commencement held in the College of Philadelphia May 30 and 31, 1765*. Morgan himself was appointed to the chair of medicine, William Shippen and Benjamin Rush being appointed at a later date. This school subsequently joined with the school of the University of Pennsylvania, and has continued to the present day (Klickstein, 1953). In 1813 a school of medicine was founded at Yale College, making five schools of medicine in the United States—and at what is now Columbia University, Harvard, and Dartmouth. Unfortunately, however, the sound ideals on which these schools were founded were in large measure lost sight of in the next century. Schools of medicine without university affiliation began springing up everywhere, and, as the numbers increased, the quality of the education they offered sharply decreased.

During the eighteenth century there was still no system of licensure in North American schools, and while some schools granted the M.D. or M.B. degree, usually after a period of two years' study, there were many apprentices, as there were in England during the same period, who announced themselves as practitioners without formal qualifications. The state and country medical societies eventually insisted on licensure, and by 1821 the state of Connecticut, through its medical society, had set up a board of medical examiners, and they forced all unlicensed practitioners to take the state examinations. This movement spread to other states and through the initiative of the New York Medical Society the American Medical Association was founded in 1847 with the end in view of raising standards of medical education on all fronts: requirements for admission to medical schools, examinations for licensure—this and much else, all duly recorded in a historical monograph by the founder of the Association, Nathan Smith Davis (1877).

During these years, despite the deplorable conditions in some of the so-called medical schools, a number of good

physicians were nevertheless practising and teaching in America, and the better students were well educated at their hands. The establishment of the School of Medicine at the Johns Hopkins University in Baltimore on a true university basis, with four years of college required for entrance, exerted a most salutary influence on the medical schools in the United States. The Flexner report (1910) on medical education and moneys from the newly formed Rockefeller and Carnegie Foundations reduced the numbers of schools of medicine and brought higher standards to those which survived. Graduates of the Hopkins went from there to other schools, taking the precepts and ideals of men such as Welch and Osler with them, and thus the influence spread.

One of these men, Milton C. Winternitz, came to the Yale University School of Medicine in 1917, and, building on the foundation of reform already begun by Dr. George E. Blumer, also a Hopkins graduate, he launched a new curriculum of medical education which has come to be known as "the Yale plan." Under this system the student is placed largely on his own; periodic examinations have been dispensed with, and he is allowed an unusual amount of freedom to pursue his particular interests and to explore the literature to which his lectures have directed him. Qualifying examinations are eventually taken through the National Board of Medical Examiners. This system, although it has been under fire by its critics since it was instituted in the 1920's, has seemingly stood the test of time, and the ideas which were thus given expression by Dr. Winternitz have spread widely—even back to Johns Hopkins and to this World Conference.

Recent Developments

Important history is often being made in our midst, passing largely unrecognized, and this is notably true of the British schools at the present time. In this country the cause of medical education has been notably advanced, not only for British schools but for those of the world at large, by a series of important Government-sponsored studies and reports—those little-read documents that so often represent the best thinking of their time.

Among the earliest was Mr. Henry Warburton's celebrated "Report from the Select Committee on Medical Education," in four volumes, prepared and printed by order of the House of Commons in 1834, in which the views on medical education of many men of British medicine of that period were sought and duly recorded. Thus Henry Holland, who had been Physician to Queen Caroline, stressed his conviction that the Royal College of Physicians should maintain a close affiliation with the English universities. He says, "I conceive that this affiliation has tended to place the profession in England, in relation to general society, higher than in any part of the continent of Europe" (vol. 1, p. 193). Holland thus gave voice to the importance of a university education in medicine. The testimony throughout the Warburton report is of challenging interest because it so frequently gives the *confessio fidei* of some of the most eminent medical leaders of the time—source material, incidentally, of the greatest value from the standpoint of biography. Thus Sir Astley Cooper gave 22 pages of testimony, in which he outlines his view of the ideal educational programme for a surgeon; he spoke with great candour on existing shortcomings, and urged that a year on the Continent should be a *sine qua non* of the training of every young British surgeon.

Of like significance was the Earl of Selborne's Commission of 1889 on the "Advancement of higher education in London," in which men such as Joseph Lister, Richard Quain, Norman Moore, James Paget, and many other prominent London physicians gave their views. In passing it is interesting to note that Lister, after relating at some length many of his own experiences as a student, insisted that he was better able to examine his own students than an examiner from the outside, although an outside examiner was always appointed to sit with him; Lister, however, served as the chief examiner.

Sir George Newman's two reports of 1918 and 1923 have already become classics in the historical literature of medical education, for no one in recent years has described the great issues with broader vision and perspective, and I here refer especially to the section of his first report entitled "A

University Education in Medicine," in which he wrote eloquently upon the theme that a medical school without university affiliation ceases to be a medical school in the modern sense.

Within the past decade there have been two other highly significant reports emanating from British sources: that of Sir William Goodenough's "Interdepartmental Committee on Medical Schools," which appeared in 1944, and the five-year report on "University Development" of the University Grants Committee (covering the years 1947 to 1952), which appeared a few weeks ago. The Goodenough Committee had proposed a vast reform and reorganization of medical education in the British schools, involving increased annual expenditures of more than £2,000,000. Perhaps the most remarkable feature of the report was its insistence upon the establishment of full-time clinical chairs of the Hopkins type for all the major departments, with provision for university stipends of such amounts that it would be unnecessary for the holders to supplement them from outside earnings. It also proposed that a suitable number of full-time readers and lecturers be appointed in these departments, with the expectation that it would be from among these lesser full-time posts that the professors of the future would be recruited.

Nearly ten years have now passed since the Goodenough Committee made its sweeping recommendations, and it is heartening to record that in that interval 55 new full-time chairs in clinical subjects have been created in the recognized medical schools of Great Britain, a fact mentioned with justifiable pride by the University Grants Committee. This committee also records progress in other directions in line with the Goodenough recommendations—for example, the strengthening of postgraduate medical education through creation of the British Postgraduate Medical Federation, and the making of clinical material available for teaching purposes in the non-teaching hospitals (Trueman, 1953).

In my opinion, there are two areas which should receive further attention in the immediate future, not only here but in North America, Scandinavia, and, indeed, wherever medicine is taught: first is the problem of the liberalization and lightening of the entire medical curriculum, the elimination of outmoded and unused areas of instruction, with the ultimate end in view of shortening the curriculum so that an able man may, with adequate training, go into practice and become financially independent and scientifically productive in a period of less than the eight or ten years now regarded as essential. Not long ago a well-known dean with many forward-looking ideas, feeling frustrated after a meeting of his reactionary faculty, exclaimed: "It is easier to move a cemetery than to change the curriculum." It is not for me, an historian, to suggest ways of improving the curriculum, but it will be my duty at some later date to record what the members of this Conference have achieved.

The second phase of medical education which urgently requires the consideration of this World Conference is mentioned only in passing by the University Grants Report—namely, the creation of halls of residence and common-rooms, where students of all faculties, including those of medicine, can come together, for there is no more stultifying tendency among young physicians than to be sufficient unto themselves, and thus to lose contact with the broader humanistic interests that make fully educated men and women. As Sir George Newman contended, this can be realized only in the university atmosphere, and I look upon it as one of the solid achievements of the past ten years that now all medical schools in this country are affiliated with the broadening atmosphere of the university community. This would have been especially gratifying to the late Sir Clifford Allbutt, who wrote in 1906: "It appears that the function of university education is not special instruction in the lines of a profession or trade, however these ends may substantively be promoted, but in expanding and enlarging the mind and making it a more and more perfect instrument of knowledge and progress, whatsoever its destination."

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MEDICINE—A TECHNOLOGY OR A PROFESSION*

BY

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I am gratefully conscious of the signal honour done to me and to my country by the Programme Committee in extending an invitation to me to speak on "Medicine—A Technology or a Profession" at the First World Conference on Medical Education, in its inaugural session. I should like to take this opportunity of conveying to this Conference a message of good will and friendship from the people of Pakistan in general and medical educationists in particular.

The status of medicine as a profession is not only extremely well founded but is a matter of universal acceptance. To those who are not perhaps conversant with modern trends the theme of my talk and the priority accorded to it in such a high-level Conference might appear paradoxical. Keeping in view, however, the changing times, the propensities of the people, the rapid diversification of the profession, and the tendency amongst the politicians and administrators, who have relegated to themselves the responsibility for planning health relief and who are graciously inclined to place us in a class of highly trained technologists and regard

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our education as purely vocational, no time will be lost in taking stock of the situation and making readjustments, wherever indicated, so as to safeguard the noble heritage of medicine in the precincts as conceived and elaborated by generations of savants and of practitioners of the healing art.

Literally speaking, "profession," according to the Oxford English Dictionary, implies an occupation in which one professes to be skilled and which one adopts as a means of living; it is a specialized knowledge pertaining to an art or a science, being applied to the affairs of others on a basis of recompense. Technically, a body of persons engaged in a particular calling could be said to be occupied in that profession. Thus defined, engineers, teachers, smiths, carpenters, cobblers, etc., could all be designated as professionalists. In practice, however, these vocations are named crafts or technical callings, and not professions. Only three vocations have, however, been granted that status—namely, Divinity, Law, and Medicine. Are there any reasons to restrict the word "profession" to these vocations only? I think there were, and still are, good reasons for doing so, as we shall see hereafter.

Technology may be defined as a systematized or scientific study of the practical or industrial arts, while medicine is a specialized knowledge, and its practice is concerned with the cure, alleviation, and prevention of disease in human beings and with the restoration, preservation, and, lately, with the advancement of health—that is, improvement of future generations of man.

Aspects of the Problem

Naturally the relationship between the practitioners of medicine and the other sections of society is the problem under consideration rather than the intrinsic nature of medicine itself, although the latter cannot be ignored altogether, for the basic nature of the subject has a determinative effect on this relationship.

Science means learning or knowledge. Medicine is not a science in the sense that it is a compendium of factual knowledge about health and disease. The matter is far more comprehensive. It is a systematized knowledge of the human body in health and disease, but it also takes into account the environment and conditions under which man lives. This is only one aspect of the problem; the other is the sociological side of medicine, which is so intricate, so vast and comprehensive, that it actually embraces almost every sphere of human activity.

The vast and imposing structure of modern medicine is perhaps one of the greatest triumphs of the human mind. To comprehend its development, both scientifically and sociologically, the evolutionary history of modern trends should prove useful, inasmuch as it will enable us to appreciate the steady and methodical progress of medicine as an ideology. It must also be appreciated that the evolution of a point of view has always been through a succession of transitions; the ideas of to-day are merely precursors of those of to-morrow. Fundamental ideas undergo a gradual maturation, until we arrive at natural laws. It must be stressed, however, that even these natural laws are not incontrovertible truths. "If a scientific man has not learnt heresy he has learnt nothing," was said by Mian Afzal Husain¹ in his presidential address in the first Science Conference held at Karachi in 1949.

The close and intimate relationship between the advancement of medicine and the advancement of

human civilization needs no comment. All phases of human activity—progress and setbacks, poverty and wealth, trade and crafts, arts and literature, poetry and philosophy, laws and social customs, economic strifes and wars—have been interlinked with the healing art, whether it was in the guise of magical rites or in the garb of religious practices, astronomical juggleries, or supplications to natural phenomena, Hippocratic rationalism or monkish or Brahminical dogmatism, speculative philosophies or scientific discoveries. Psychological maladjustment, major or minor, fixed or ephemeral, obvious or dubious, almost universally affects the human race. Has the world known a higher suggestive agent than medicine for such affections?

Nations have risen and fallen, wars and revolutions have come and gone, civilizations have appeared, matured, decayed, and died; but that noblest expression of human aspirations to deliver men from physical and moral disabilities has maintained its unity of purpose throughout the ages. While fully appreciating the fact that the medicine of to-day is very much different from the medicine of yesterday, it has divided and subdivided into innumerable subsections, each subsection being a colossal thing in itself; but, even as such, each is served by an arterial stem, which, like the human body, draws its nutriment and force from the heart; in the case of medicine this heart being humanitarian considerations, self-effacement, and sacrifice. Such a conception is included in the word "profession." If medicine becomes a technology then it is a machinery, a power without a soul, its sinews being steam and iron, not blood and heart. With this brief introduction let us delve into the wisdoms of the bygone ages and see if we can find something there for our guidance.

Early Needs of Man

Let us for a moment consider the earliest settlement of man on earth, of which naturally there are no records. After human beings had firmly established themselves on the earth as a separate and distinct species, their immediate and urgent requirements would have been food and water. They would have tended to group together, community life offering better chances of survival. As suitable places became available the nomadic life would have gradually tended to take the shape of small settlements. The need for succour in inexplicable afflictions created deities; the need for succour in injuries and illness produced medical men; and need for settlement of disputes established rules of conduct—i.e., law. This, then, was the beginning of the three professions, Divinity, Medicine, and Law.

We are now in a position to study the latter phases of the development of human society, of which meagre records are available. It should be remembered, however, that there has been a lapse of untold centuries between the two epochs.

The word religion here has been used in a collective sense. In ancient times the gods, the demons, magics, astrology, supernatural and subtle forces, good and evil spirits, were all jumbled together, worshipped and invoked whenever a calamity, drought, disease, death, or any other misfortune confronted men. Gradually a group of people took to the art of communicating with the subtle beings and warding off their baneful influences. They were the wise ones—namely, the religious-cum-medical men. To practise their art these people must have needed authority. It was necessary to inspire awe and respect into their charges. To that end they had to adopt peculiar costumes and imposing practices. The life of early settlers on earth was thus enveloped in mysticism and blind faith. But it must not be assumed that it was all valueless jugglery. Unmask the witch doctor and you will find a really intelligent and

clever physician. His methods may be empirical, but enveloped and deeply hidden in his symbolical and mystic practices you will find a kernel, a sizeable kernel of truth, gleaned and nurtured by generations of wise observation and experience. Merger of medicine and religion was inevitable. Medicine aetiologically involved knowledge of malignant and beneficial forces. Treatment, besides exhibition of pills and potions and dressing of wounds, entailed propitiation of those forces. The major portion of religion was propitiation, through ritual incantations and sacrifices. The two practices were so much akin in their objective—the warding off of evil—that their amalgamation was a foregone conclusion. The result was that medicine began to lose contact with the forests and the fields, and along with religion began to enter sanctuaries, and for centuries to come these constituted its abode and its nursery.

So far we have been discussing the probable course of the development of medicine and its practice in prehistoric times. The earliest records of civilization that flourished are to be found around the valley of the Tigris and the Euphrates; the Nile; along the shore of the Mediterranean; the valleys of the Indus and the Ganges; and the Yang-tse-kiang and Hoangho, in China.

Religion and Medicine

The earliest civilizations about which records exist are the Sumerian, the Akkadian, and the Babylonian, the Egyptian, the Greek, the Persian, the Indian, the Chinese, and the Arabic. In this context the impacts of the great religions on medicine have also to be borne in mind. At the height of the Babylonian civilization, medicine definitely began to take a scientific turn, and a dissociation between religion and medicine was largely effected. Egyptians were the first to lay the foundations of socialistic medicine. Laws were extant which covered every aspect of Egyptian life from birth to death, diet, dwellings, sex—in fact, nothing was left out. Just as for other sections of society, the status as well as the practice of medicine was well defined by regulations. As physicians their technical talent was held in high esteem, not only in Egypt but also in the neighbouring countries. Homer² in his *Odyssey* terms them as men "with knowledge beyond all men." Specialization in various branches of medicine was placed on a firm footing. Medical men were paid by the State or the community; private practice was not allowed. Hospitals and sanatoria were annexed to temples but were administered separately. The formulation of laws of public health and their practice were functions of the medical man.

The next era which has an important bearing on the subject under deliberation is the dawn of great religions in Mesopotamia. The new religion did not aim at a federation of the extant deities, in place of that it advocated a single God, conceived in perfection and endowed with supreme power, exercising his authority through his apostles, over the creation below. The system had many advantages, but it had disadvantages also. The advantages were mostly social. It led to a levelling up of society. The world and its good things ceased to be a monopoly of the selected few, particularly when these few had become so vainglorious and self-centred that common folk counted worse than flies. The disadvantage was that it led to the virtual death of the scientific attitude to life. Over hill and dale, in solitude and in company during night and day, people hankered after the truth. Metaphysics became the order of the day.

To the hand of the diver
The gains of the tide,
To the eyes of the bridegroom
The face of his bride,
To the heart of the dreamer
The dreams of his youth,
For me, O my Master,
The rapture of Truth.—SAROJINI NAIDU³

Even whatever progress had been made by the Babylonians, Assyrians, and the Egyptians was destroyed deliberately, and, so far as they could manage, completely—of

course with the proverbial best of intentions. The Jewish medicine was theurgic in nature, God being the source of health as well as disease. The concept of life was teleologic. In spite of the dominance of priesthood the ancient empirical medicine, however, continued to thrive.

Indian Medicine

In ancient India medicine constituted a part of religion. *Sushruta Samhita*⁴ is the most representative book of Ayur Veda, or Hindu Medicine. A study of this work unmistakably reveals the high premium that was placed on the selection of students for entry into the precincts of this sacred knowledge. Ethical standards, laid down both for the teacher and for the taught, constitute gratifying reading. Only a brief presentation of the initiation of a student to the study of medicine can be given here.

Samhita lays down special qualifications for taking up a medical career. It says, "He should be of tender years, born of a good family, possessed of a desire to learn, self-strength, energy of action, contentment, character, self-control, a good retentive memory, intellect, courage, purity of mind and body, and a simple and clear comprehension. . . ."

It lays down rigid ethical standards both for the teacher and for the student. The preceptor addresses the student at the time of the initiation in the following words:

"Thou shalt renounce lust, anger, greed, ignorance, vanity, egoistic feelings, envy, harshness, niggardliness, falsehood, idleness, may all acts that soil the good name of a man. . . . If I, on the other hand, treat thee unjustly even with thy perfect obedience and in full conformity to the terms agreed upon, may I incur equal sin with thee, and may all my knowledge prove futile, and never have any scope of work or display. . . ."

Having read this it hardly leaves any room for comment on the expectations of society from a medical man and of the status of the medical profession in ancient India. Medical man was accorded the status of Devtas, or God-like man.

Greek Medicine

Now we come to a period and a country whose medical development has left a lasting effect on the medical concepts and medical practice of the world. I refer to Greek medicine. In the early Hellenic medicine we still find the priest clinging on to medicine. As time passes, medical development gradually but with certainty takes a scientific turn. There are some new developments also—a philosophy, a system of deductive logic and speculative reflections to explain away natural phenomena associated with medicine. All the practices of ancient medicine prior to this period were purposeful and practical in nature—that is, were designed to get rid of or ward off impending evils. No heed was given to the basic phenomena, particularly in relation to cause and effect. A study of the relationship between the microcosm and the cosmos led to a rich and colourful speculative philosophy. The requisites of scientific development are freedom of thought and freedom of action. In ancient Greece religion was there, but it had not taken the shape of shackles and taboos; political ambition and motivation had not yet learnt to utilize religion or medicine as a means to their ends. Criticism and contradictions of well-established and current notions were tolerated. Human thought and activity were not directed and confined to narrow impervious channels, which later the great religions contrived to inflict on the freedom of human thought, any deviation from which surely and unerringly led to inquisitions and the scaffold. In the days of Homer, medicine had established itself as a noble art. A physician, in the words of the great poet, was "a man who was worth more than many others."⁵

With regard to ethical standards, the Hippocratic Oath cannot only stand repetitions but, in the interests of ethical standards of our own times, its enunciation from time to time should act as a sort of "lest we forget." I feel it will do the profession immense good if it is included in the

curriculum of medical studies. Hippocrates (460–355 B.C.) taught that a physician should be modest and dignified. He should be serene and tranquil. His judgments should be based on knowledge and not on superstitions. A physician's religion was his loyalty to the interests of his patients and his faith, search for truth pertaining to disease. Medicine for the sake of medicine without any magical alloys and religious amalgams, divorced from dogmas and based on observation with a philosophic outlook, and meant for the service of afflicted humanity, as an end in itself, without reference to conceptions of divine intervention, should constitute an article of faith for a physician.

Thus we find the cult of medicine based on foundations as firm as the rocks. Priestly medicine did not die out, and shall survive so long as superstition and weakness balk the spheres of human activity. Hippocrates and his school, however, succeeded in fairly establishing an art which could and did exist as an honourable and revered profession without religious or magical embellishments.

Contribution of Rome

The next great civilization, that of the Romans, although it produced little new, did contribute immensely in another direction—namely, consolidation of the gains made so far.

A perfect system of hygienic legislation was established. The medical profession was accorded a definite status recognized by the law. Physicians constituted an esteemed class; they were recipients of the highest State dignities and held socio-political and administrative posts of a high order. Medical schools were granted official recognition. It was during the Roman Empire that legal medicine came into being.

At this time an event transpired which brought about an upheaval involving almost a major portion of the known world. I refer to the advent of Christianity. For the faithful, Jesus Christ was the physician for both the body and the soul. Medicine thus again became theurgic. The saints or the holy relics began to attract pilgrims, mostly sick people in large numbers. To house and look after them special buildings called Hospitalia were allocated.⁶ Priesthood had succeeded in establishing itself in a very dominating position. This dominance was not confined to the Christian world alone. Usurpation of authority was a universal trait with the priesthood. This state of affairs could not last for ever. There were protests against it in Europe as well as in Asia.

A reorientation of the social structure took the shape of Islam in Asia. According to the Islamic faith, Mohammed was the last of a chain of prophets through whom God had been conveying his messages to the creation below. Islam definitely and clearly discouraged the formation of priestly castes. "There is going to be no monasticism in Islam," declared Mohammed. Thus at one stroke the age-old grip of the priesthood on medicine came to an end. This in my opinion constitutes the greatest contribution of the Arabist period to the development of the medical profession. Ethical standards were raised; registration and conferment of degrees after education in colleges were started. Hygienic measures of a far-reaching nature, regulating the entire life of the people, were introduced and enforced. During the Renaissance and the post-Renaissance period, and even today, the practice of medicine is practically a true copy of the traditions set up by the Arabs. With regard to ethical standards, two examples from the Arabist period should clarify the position. Bu Ali Sina (Avicenna, 980–1037) in his autobiography writes: "At first I treated patients not for fees but for my own instruction. During this period of my studies I never passed the whole night in sleep, nor passed a whole day in any occupation but study. Whenever I met an obscure point, it was my custom to perform a total ablation and then proceed to a mosque, where I prayed to God to grant me comprehension and unlock for me the gates of difficulty." When Hunayn Ibn Ishaq (Johanitus Onan, 807–877) refused to oblige Caliph Al-Mutawakkil by concocting a poisonous draught to free him of one of

his enemies, the physician was interrogated to find out what enabled a humble physician to disdain alike the pleasure and the wrath of the caliph. Hunayn replied, "It is my religion and my profession."

Contributions of the Profession to Society

On the corner-stone of Hoff Hall⁷ of the Medical Field Service School, U.S.A., the words of Jeremy Taylor (1613-67) are engraved: "To preserve a man alive in midst of chances and hostilities is as great a miracle as creation." In the day-to-day life of a medical man there is a definite and continuously operating humanitarian bias. This attitude towards others stands out in marked contrast with some vocations that are organized round utter selfishness and self-aggrandizement. In other walks of life there undeniably have been men and women who have made sacrifices, but such instances have been purely individualistic. In medicine this phenomenon pervades the entire profession. Mostly this characteristic has manifested itself in person-to-person relationship, but in some cases, by nature imbued with a sense of fellow-feeling which vibrates violently and incessantly with every twang of pain in others, it has assumed the shape of social reforms.

Medical men naturally were the first to become cognizant of the social, cultural, and environmental factors responsible for disease. How much the industrial revolution, reforms for the elimination of overcrowding and slums, improvement of factory conditions, drainage and town planning, maternity and child welfare schemes, pure water supplies, control of food and drugs, prevention and control of preventable diseases, owe to the efforts of the medical profession needs no recapitulation. In their selfless endeavours and self-effacing sacrifice for an ideal against heavy odds, who can say they have not shared equal honours with the great apostles? Reduction in various mortality rates and control of epidemics have deeply affected the world both psychologically and economically. Anxiety neuroses and community hysteria associated with epidemics are now matters of historical importance only. Constructive creative work and long-range planning necessitate tranquillity of mind. If organized efforts of the medical profession have succeeded in controlling and in certain cases eliminating epidemic manifestations of disease, the world should look upon them with appreciative gratitude. It should also be mentioned that the basic sciences owe their development to a considerable extent to medical men. Thus Copernicus (1473-1543), Galileo (1564-1642), Gilbert (1544-1603), Galvani (1737-98), and Geber (Sufi Jabir Bin Hayyan, middle of seventh century) were all medical men. Professor Huxley (1825-95) had remarked in 1854: "Medicine was the foster mother of Chemistry." In my humble opinion if one substituted basic sciences for Chemistry it would represent the situation more correctly.

Development of Medical Education

Two outstanding features mark the trends of medical education in ancient times: (1) the critical selection of new entrants to the profession; and (2) the close and intimate relationship between teacher and taught. The pupils lived more or less as members of the family of the preceptor. Not only were they thus provided with ample opportunities for picking up the technical side of the profession, but imperceptibly and with certainty they became conversant with the manners and the morality of the profession also. It is not possible to reproduce atmospheric isobars in intellectual fields, but reasonably good replicas of the great masters were often turned out. The prevalent systems of government definitely influenced the progress of the profession. There was the omnipotent king. It was he who appointed or dismissed the ministers and the administrators; the latter were therefore responsible to him and not to the people. Their weal and well-being were linked with the courts. Courtship of the people therefore did not interest him. As time went on settlements took the shape of kingdoms and kingdoms expanded into empires. The ancient system could no longer cope with the needs of the times.

The Romans were the first to provide institutional treatment for the sick. Their hospitals they called "valetudinaria."⁸ Automatically these institutions also became the centres of medical education. Medical men could now be turned out in larger numbers, but at the same time the selection of the proper type of student and the individual attention of the preceptor had to be relaxed. There were physicians, surgeons, and pharmacists attached to these hospitals; students had to go to all of them. In the Arabist period "bemaristins," and later in Christian Europe hospitals, were established. During the Renaissance in Europe medical practice and education followed exactly the pattern established by the Arabs at Bagdad and Andalusia (Spain). Medical education thus practically became impersonal.

There was a gradual, imperceptible, but sure change in power politics also. Power began to pass more and more from the kings to the people. The politicians and the administrators began to feel the need for courtship of the people. From the press and the pulpit, propaganda for more and more doctors and greater and greater specialization was made. These downward trends were further precipitated by the advent of the two major wars, after a brief spell of peace in between. The last war has been followed by a cold war between two ideologies dividing the world into two potential war camps armed with the atom bomb and the hydrogen bomb.

This state of affairs is giving impetus to a greater and greater production of doctors, and particularly to the mass production of specialists. The absence of sustained emphasis on the classical background of the profession during their undergraduate training has materially altered the outlook of medical students. They have begun to regard their medical education as vocational training, and the impression gathered by the general public seems to be of the same order. For specialization the highest type of general medical education should be the first prerequisite. This should be followed by protracted practice as general physicians or general surgeons over many years. Our mighty rivers, which with the majesty of their flow, the enormity of their expanse, and the dignity of their depth inspire awe in the spectators and infuse life in our lands, were but tiny rivulets to start with. While coursing through hill and dale they annexed a tributary here and a pool there until they assumed the status of great streams. No pumping system that human ingenuity or diligence is capable of inventing could create such phenomena. Specialists should be allowed to develop in the same way. Hippocrates, Galen (129-200), Avicenna, Rhazes, Sushrta, Vesalius (1514-64), Koch (1843-1910), Virchow (1821-1922), Sydenham (1624-72), J. Bright (1789-1858), Jenner (1749-1823), were not rushed through any special courses after obtaining their general medical qualifications. It was their lifelong study and sustained endeavour that brought their specialties to them, and it is this type of specialization that can do, and has done, lasting good to the world and brought honour to the profession. Mass production of immature specialists can have but one ending—conversion of the profession into a technology. To accord the status of a cardiologist, a urologist, and so forth to a freshly qualified postgraduate would be courting disaster. A half-baked specialist is as bad as a half-baked potato—one upsets a poor digestion, the other sets up a poor profession. Socialization of medicine is another step which is leading the profession in the same direction.

There is, however, a question to be answered. Why are our young men heading headlong towards specialization? The answer is very simple. It brings them status as well as money. If we stop this specialization, what are we offering them in exchange? Ethics, morality, and so forth alone cannot cut much ice. A medical man, whatever we might designate him, must have a sound income to enable him to maintain a respectable status and a comfortable standard of living. Neither the official services nor general practice are conducive to high profits or high status. There is nothing intrinsically wrong with the present generation. Society,

administrative machinery, and even ourselves have created conditions by which they can move only in one direction—mass specialization, which is alike detrimental to society as well as to the profession.

After the Renaissance in Europe phenomenal progress in medicine was a direct result of advances in basic sciences. At the present time attention is being paid more and more to a still closer association between medicine and the basic sciences. This infiltration of the medical profession leads to further maturity and appreciation of the width of the foundation on which the edifice of medical research rests. No doubt it is a move in the right direction, and it has certainly heralded great discoveries, but unfortunately, directly or indirectly, it again lays stress on technology. It is not my intention to decry the latter, but this concentrated attention on technique to the exclusion of a stress on discipline is bound to have a harmful effect on the professional concepts in the minds both of society and of the young undergraduates.

It is this aspect of the question which is drawing the attention of more and more educationists to-day. Medical education constitutes a university discipline and not vocational training. That position it has occupied for centuries. With the advancement in other sciences there has not only been enormous expansion in the parent subject but a great many newer branches have sprouted and established themselves in an apparent independent existence. As these sub-branches gain momentum they become more and more technical and highly involved. Ultimately there is a danger that these specialized studies may swamp the basic general education that a university discipline is calculated to impart. Any system which aims at preparing the undergraduate in a subject or group of subjects must have a relevance to life in general. The essential aim of technological training is to impart existing knowledge of a particular subject. It is concerned with the future so far as existing knowledge can be applied to particular situations which for the time being cannot be foreseen. All education, therefore, has its basis in technology. Education, in the higher sense of the development of the power to form judgments, becomes possible only after such techniques have been mastered. Technical knowledge is therefore an indispensable foundation for higher education.

University education as it pertains to medicine has three objectives—learning the technique, learning the art of applying this technique, and learning to give priority to the interests of others. In medical practice the last two constitute the dominant aspects. Such concepts have no place in a technical calling.

Dangerous Trends

In spite of having gathered so much glory around it the medical profession was never in so much danger as to-day. There are several reasons, internal as well as external. Among the internal causes the foremost, paradoxical though it may seem, is the great development in techniques and diversification of medicine into innumerable channels. This has resulted in the formation of cults within cults. This aspect has already been dealt with, but its importance, I feel, justifies a reiteration in some detail. Our undergraduates are becoming more and more vocational in outlook. Under the stress of time and of market demands we have also initiated mass production of medical specialists. If the profession does not make strenuous efforts to formulate a coherent policy by which the younger shoots continue to derive their sap and stamina from the roots and the stem of the parent tree till they are mature enough to maintain an independent existence they may drift away into discord and disaster. Engrossed and enamoured with the study of the individual trees, the concept of the forest is being lost.

As stated above, this overemphasis on technique is adversely affecting the concept of the profession. Consideration of the patient as an individual with a peculiar environment and a particular psychic background is largely ignored. The stethoscope, the x ray, and the electrocardiogram have

come so much into the limelight that the poor patient whose coronary artery or valve is the subject of this instrumentation is lost in the shadows of the umbras and the penumbras. The position of the medical man is above that of a slave of the instruments, and the patient deserves greater consideration than that given to a laboratory analytical specimen. No, he is not just a case. In his social set-up he occupies an important and a complicated position. His illness or death has a bearing on the lives of scores of others, epidemiologically as well as sociologically. The adage that we are treating a human being with a disease and not a disease should never be lost sight of.

The same is true of the specialties. They are not selective. Students pick a specialty rather from expediency and by chance than from their natural inclination. The defect is in our system of education. We allow specialization before a young man has sufficient maturity to decide anything for himself intelligently. This hit-and-run of random specialization without experience as a general practitioner cannot help a medical man properly to decide what his specialty is going to be. Let first things come first. Development of individuality must have precedence over specialization. We must refrain from putting the cart before the horse. Deciding factors naturally are the requirements of the country and its resources. In most underdeveloped countries the crying need is the control of preventable disease. The economic resources of these countries are generally inadequate even partially to cover this fundamental need. Even rich and advanced countries are uncomfortably conscious of the financial burden associated with the maintenance of specialists and the institutions and equipment which are prerequisites for the adequate discharge of their duties.

Let us consider again this specialization in the context of a world problem. In most of the backward countries even basic medical aid is not available, leave alone specialization. More than three-quarters of the world consists of such less fortunate countries. In view of the larger interests of the world, therefore, the maintenance and the revival of the concept of "profession" and what it stands for are of vital importance. There is no other solution. The politician is never slow to turn situations to his own advantage: power is like intoxication, the more you have the more you want to have. The administrator also appreciates that the situation is shaping into a position which can be of considerable advantage to him. That the profession of medicine to-day is a dead letter and a slogan, and a medical man merely a high-class technician, suits both the politician and the administrator. We as medical men have a different background, different traditions, and a different outlook on life. The generality of people are incapable of appreciating collective good. They do not know the difference between the amenities they enjoy to-day and the conditions that prevailed say a century back. A gulf is being created between us and the public which is being widened by interested parties. It is our duty to bridge this gulf. We do not need help from the State or from any other source to accomplish it. It is a domestic affair, and we should be capable of managing it ourselves in spite of every obstacle that is placed in our way. It is neither possible nor proper to offer any detailed proposals on the subject here. I feel that the solution lies in the revival of the general physician and the general surgeon on better-organized lines.

The confusion is worse confounded by ignorance, natural or wilful, on the part of the politicians and administrators who have assumed responsibility for medical programmes, by complacency and a tendency to drift with the stream on the part of the medical educationists, and by the exigencies of the times, which have allowed little opportunity for us to probe into the problem to the depth the situation called for. Instead of facing the situation squarely we have started playing to the gallery. Technology and profession are closely linked with indissoluble links, and yet they are not one and the same thing. Technology is the foundation on which the edifice of the profession has been built. It has its birth in the laboratory, and provides us with concrete, exact, dry

facts. A patient brings a chit from the laboratory, "*Bact. coli* isolated from the urine"; another presents an electrocardiogram. If one were to go over hundreds of such patients no two would present exactly similar systems. The machinery has done its work; it requires a mind to interpret and correlate the facts presented by the laboratory. Profession begins where technology ends. Technology is but an adjunct to profession. Profession existed when there was no technology. Without profession, technology is a sterile endeavour. What use is even a jet plane without a pilot?

Let us leave aside for a while acts of omission and commission by others. Some heart-searching is indicated at home also. How far have we ourselves contributed to the prevalent notions? The crux, the backbone, of an ideology is a study of its history, inculcation of its ethics, and an appreciation of the duties it ordains and the privileges it confers. In our zeal for mass production and in our zest for specialization we have ignored this fundamental formative aspect of the profession. Medical men that we have turned out during the last few decades have no such background. Society judges things by their face value. The word "leader" is becoming a misnomer. Leaders of to-day do not lead, they are led by the people. To their "aye" they say "aye," and to their "nay" they shout "nay." If public opinion fits in with their scheme of things also, their declamations are all the more vociferous. The jury's verdict is also not in our favour: the judges have no reason to go against the jury. We cannot preach one thing and practise another. Our bona fides has to be judged on the anvil of facts. Let us set our house in order and then invite an inspection. In the history of a profession as old as the world itself, decadence for a few generations should be of little moment. From what I have said there can be no gain-saying the fact that the profession of medicine is a profession first and last and not a mere technology, the latter being just one of the basic links in the medical set-up.

The discernment of the difference between a locomotive and the wheels of a locomotive can constitute a problem only for cortical amblyopes.

Light Ahead

I have pondered deep and long over the matter of this discourse. In my endeavour I am but following in the wake of many others who have preceded me. The goal lay high up at dizzy heights, enveloped in bewildering haze. During the last century diverse approaches to it were conceived and executed. The haze is lifting now. With the improved visibility we can now see things in their proper perspective. Our previous efforts were based on an optical illusion; we had been following a false image. The highways we have built lead away from the goal and are strewn with pitfalls and covered with unstable shingle. We have to discard them. The question of paramount importance before us is the education of the undergraduate on proper lines. The conception associated with the word "profession," its scope, its responsibilities, and its privileges should be fully brought home to him. Technical education constitutes the foundation on which the future edifice of medicine is going to rest. This aspect should also be accorded the consideration it rightfully deserves. It should, however, be consistent with and conform to the nature of duties that are going to be assigned to him after his graduation: no more and no less. It should help in making the medical education correct, concise, and yet productive of medical men of a higher order. Those who show promise should be afforded opportunities of acquiring the highest type of general education—that is, general medical or general surgical. I want to lay special emphasis on this point. Postgraduate qualifications, M.D. (Cardiology) or F.R.C.S. (E.N.T.), and so forth, should never be countenanced. After the benefit of this type of medical education the men should enter into the general practice of their art. Many years of such a practice should assist them in expressing themselves. It is not cramming with set courses which makes real specialists. Proficiency is born of pro-

pensity. For a final moulding the trusted and trained hands of accomplished specialists are essential. The time should then be ripe to place the developing specialist under their care, he being allowed an opportunity to work under a man of his own choice. When this final stage has been completed satisfactorily the new specialist could embark on an independent career. Any institutional training after this should be superfluous.

Technology has its place in medicine as a very important, I should say an indispensable, auxiliary, but I do feel it is sheer waste of time and energy to impart medical and advanced technological education as applied to medicine to one and the same person. Let me elucidate my point by a few examples. Anatomy, applied physiology, biochemistry, pharmacy, pharmacology, bacteriology, including protozoology, helminthology, entomology, histology, histopathology, radiology, electrocardiology, and so forth, can all be taught and practised as independent subjects. Technical advancement and proficiency in practice should be much greater if they could be studied as independent sciences, and not as appendages to medicine. As no lures of private practice could be attached to these technologies those practising it could do much more concentrated work. It goes without saying that these studies should be afforded post-graduate educational facilities of the highest type while remaining outside the medical profession proper, but, acting as its auxiliaries, they could be eligible for the highest honours and status open to other sciences. They could also with advantage be associated with medical education proper if, when, and where indicated.

These suggestions deserve the deepest consideration. If they are adopted the controversy, "Medicine—A Technology or a Profession," automatically comes to an end. If undergraduates could be relieved of the unnecessary burden of technique more stress could be laid on the basic aspects of medicine. Both medicine and medical technology could benefit considerably by such a dissociation. We could produce better medical men, fully alive to the fundamental concept of the profession of medicine. Chances of research and consequent advancement in technologies auxiliary to medicine could be much more enhanced. Medicine and technology could develop side by side, each aiding the other but without any chance of trespass.

Conclusion

I have discussed here at some length the historical development of the medical profession. I have shown the intrinsic difference between "profession" and "technology." I have also indicated the part medicine plays and has played in the social and economic development of the world. We have also seen the drift that medicine is taking to-day and the intrinsic and extrinsic dangers to which it is exposed. I have also broadly hinted at the task which lies ahead of medical educationists. The greater the magnitude of the task the greater the responsibility. There is, however, no room for despondency. Our forefathers weathered worse storms and with faith, honesty of purpose, and organized effort won more glory; and the prestige of the profession has been ever rising. I think—nay, I believe—we have material which can rise on any occasion. Ours is a profession built on the rock of humanitarianism, strengthened by self-effacement and self-sacrifice. We have a place of pride and honour in the community we live in. I am sure we shall live up to the traditions of our noble profession.

¹Mian Afzal Husain, first President of the Public Service Commission of Pakistan; in his presidential address at the first Science Conference, held at Karachi in 1949.

²Castiglioni, A. *History of Medicine*, 1947 edition, p. 59.
³Sarojini Naidu, wife of Major Naidu, of Hyderabad, Deccan (India), poetess and a politician. Died as Governor of United Provinces of India in 1950.

⁴*Sushruta Samhita*, one of the famous ancient Hindu books on medicine. Translated by Bhisage Ratna, 1907.

⁵Castiglioni, A. *History of Medicine*, 1947 edition, p. 117.

⁶C. Singer. *A Short History of Medicine*.

⁷E. E. Hume. *War and Medicine in New Worlds in Medicine*, edited by H. Ward, 1946 edition, p. 81.

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THE SECTIONS OF THE FIRST WORLD CONFERENCE ON MEDICAL EDUCATION

We invited the Vice-Presidents of the Conference to present brief statements on the subjects of the sections they presided over this week, and these are printed below under the headings of each of the four sections.

REQUIREMENTS FOR ENTRY INTO MEDICAL SCHOOLS

THE SELECTION OF STUDENTS

BY

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No greater responsibility devolves upon medical educators than that of determining who are qualified to study medicine and who are not. I am sure that any evaluation of the results of these selective efforts by those who exercise such responsibility would be characterized by extreme modesty, if not humility. All will admit that errors in judgment have excluded from medicine some who are qualified to become physicians and have included some who should not enter medicine.

Section A of the First World Conference on Medical Education addresses itself to this problem to the end that world-wide experience may help achieve a closer approximation to the ideal goal. Certain qualifications of potential medical students are relatively easy to measure, while others are virtually impossible to determine.

It is granted that acceptable candidates must be intelligent and that we can measure that intelligence with a degree of accuracy by various testing devices, examinations, and the academic performance of the applicant. But how may we be satisfied that a candidate couples emotional stability with his intelligence? I believe it remains to be demonstrated that brilliance is more likely than mediocrity to be associated with emotional instability. Yet we have all seen too many examples of intellectually able medical students whose lack of stability unfits them to be medical students and physicians of a high order. May we eventually be able to determine emotional stability as effectively as we can determine intelligence?

Motivation

Again, let us suppose our candidate possesses the aptitude for science and medicine. Although aptitude tests may be less reliable than those of intelligence, we can probably arrive at a reasonable approximation to the truth by appropriate means. But is the aptitude joined with proper motivation? Is our student possessed of a drive toward medicine that cannot be denied? Has he a single-minded devotion to his work as a student, a house officer, and a physician so that the many denials to himself are fully compensated by the gratifications of his chosen tasks? The arduous job of studying medicine leaves no room for less than wholehearted effort.

A misdirected apparent orientation towards medicine, of which the student himself may be unaware, may stubbornly defy detection. I do not refer to the simple case of the intelligent, apt candidate who says, "My father always wanted me to study medicine, but I do not." His case is easy. Also, he is rare. More common is the misfit student who fully believes he is properly motivated. He says, "My father always wanted me to study medicine, and I also have always desired it." The parent may have exerted no obvious direct influence, but in numberless unplanned indirects pointed the son's career toward medicine. How to detect real from fancied strong motivation is a challenge. Often the

defect manifests itself only by a failure to master the work of the medical school, following painful efforts to succeed.

The coupling of intelligence with emotional stability, and of aptitude with motivation, requires further sound character and lofty ideals, objectivity tempered with warm kindness, and industry born of devotion to work. Perhaps these attributes may never be measurable. Yet we must never cease trying.

It would be well if we could estimate these desiderata of a medical student and physician even before he has completed his premedical studies, but not, in my opinion, for the reason commonly given. We are told that a very early knowledge of a student's qualifications for the later study of medicine might save him future disappointment, and also prevent him from "wasting time" in premedical studies instead of pursuing another line of education. I agree with the desirability of avoiding disappointment, but I have little sympathy with the "wasted time" concept, unless education for life is wasted time for the would-be physician.

The kind of education which best prepares a student for medical school also prepares him well for other pursuits. In such general education I would include natural science prominently. To-day it is fashionable, at least in the United States, for advisers of potential medical students to say, "Premedical students should not take too many science studies; they should acquire a good general education," as if education in natural science were of a lower order culturally than is education in the humanities or social sciences. Such educational advisers of to-day are akin to certain of the humanists of the past, who dismissed, without ceremony, science as a factor in general education. Thomas Huxley (1899) called them "Levites in charge of the ark of culture and monopolists of liberal education." He decried the accepted reference to the Renaissance as the "Revival of Letters," saying "... as if the influences then brought to bear upon the mind of Western Europe had been wholly exhausted in the field of literature. I think it is commonly forgotten that the revival of science ... was not less momentous."

Perhaps a legitimate reason why a student should not devote too much time to science in his preparatory studies is that by limiting the time he devotes to the humanities he may never appreciate that the humanities have no more proprietary claim than does science upon the dramatic, the imaginative, the beautiful. No epic poem displays a majestic sweep excelling that of Darwin's evolutionary history. The balance and perfection of composition of a painting are equally apparent in what Walter Cannon called "The Wisdom of the Body."

The burden of my thought is that we regard science, and teach science to prospective physicians, without apology for its utilitarianism, and as an indispensable ingredient of human culture.

Conclusion

Let us venture the hope that this conference may contribute some measure of advance towards a better selection of those most qualified to become physicians, who possess not only intelligence but emotional stability, not only aptitude but motivation, not only industry but warmth and kindness. Let us further hope that we may make some progress toward an improved preliminary training of future physicians; an education which includes the humanities and the social sciences, and also gives prominence to the natural sciences, not merely as pragmatic tools, but as an indispensable ingredient of the cultural development of a physician, a lawyer, a clergyman, or any other productive citizen of the modern world.

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AIMS AND CONTENT OF THE MEDICAL CURRICULUM

UNDERGRADUATE MEDICAL EDUCATION

BY

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It is significant of the times that a symposium on undergraduate medical education should have been sponsored by the World Medical Association with the active co-operation of the World Health Organization and other international associations. Since the World Health Organization started work on an international scale in the field of prevention and cure of disease, it has become increasingly clear that the personnel of the medical profession must possess a minimum basic qualification if they are to participate effectively in the furtherance of programmes in the different countries concerned. In its preamble the World Health Organization's concept of health has been clearly defined as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." This implies a wider concept of undergraduate medical education than that which was accepted 30 or 40 years ago.

The objectives of medical education have undergone significant changes during this period and the duties and responsibilities of the basic doctor have widened and increased. His concern is no longer the cure of the individual patient entrusted to his care. The preventive aspects of disease have long been emphasized, and it has been suggested that during the whole period of his clinical studies the student's attention should be directed to the role of preventive medicine in the promotion of health. It must, however, be admitted that in many schools little or no real progress has been made, because to learn the fundamentals of preventive medicine one should go to the field, to the very source where the problems are being tackled. They cannot be learnt by didactic lectures or through references made during clinical demonstrations.

Medicine and Society

In recent years it has been realized that another aspect of medicine deserves increasing attention—the study of social pathology in relation to the causation and incidence of diseases and their prevention. Public health has been largely concerned with communicable diseases—their causes, distribution, and prevention; while social medicine is concerned with all prevalent diseases which have their epidemiologies and their correlations with social and occupational conditions, and should ultimately be regarded as to a greater or less degree preventable. Social medicine is thus concerned with the pathology of families, groups, societies, or larger populations. The medical student has therefore to be familiarized not only with the pathology of the diseased condition in the patient but with those more important conditions in the home, family, and community whose prejudicial effects may have been the causal factors of the disease and may unfavourably influence smooth convalescence and recovery, if they do not actually promote its recurrence.

Clinical and Preclinical Studies

In will therefore be seen that during the past half-century there has been a changing concept of the relation of medicine to society. It must necessarily follow that this change of concept should influence the trend of medical education and reorientate the methods pursued in undergraduate medi-

cal education. The course of undergraduate medical study is conventionally divided into two parts—the preclinical and the clinical. In the light of present-day requirements this would seem to be an artificial distinction, and the greater the degree of integration between preclinical and clinical subjects of study the greater will be the young undergraduate's appreciation of the fundamental medical sciences and their application at a later stage of the studies.

Anatomy and physiology as basic medical sciences are undoubtedly of great importance to a proper appreciation of the clinical studies at a later stage. But to the young undergraduate in medicine the study of these subjects is of importance and interest more in their applied aspects and in their relationship with a clearer understanding of their application in clinical medicine and surgery. It is obvious that reform in the present curriculum that would integrate the basic sciences with the clinical courses is necessary, and, with this end in view, the simultaneous use of the patient as a means of stimulating the student and aiding his memory would be of great value. Thus some of the time now devoted to the preclinical sciences might well be used to give the student an opportunity of gaining some clinical insight, his time being employed with more profit in the performance of blood counts, urine analysis, and the observation of such pathological factors as would enable him to gain a firmer knowledge of the underlying physiological principles.

Likewise, during the clinical period some time must be surrendered to the basic science faculties to permit the presentation of such anatomical, chemical, and physiological information as would be better appreciated at that stage by the clinical student. Most medical teachers will agree that, whenever possible, the content of courses in the premedical curriculum, particularly science courses, should include a generous amount of medical orientation. It would add to the student's interest and enthusiasm, tend to unify the educational process, and this could be done without any violence to the values of discipline in pure science.

It is hardly necessary to state that the study of pathology has developed into one of the most important basic medical sciences. Herein the undergraduate is introduced to disease: he sees the damage that is wrought by various factors and studies the changes in tissues in various stages of disease and the reaction of the tissues in their effort to conquer it. The gross and microscopical study of disease tissues thus helps him to a better appreciation of the laboratory sciences and clinical medicine. The same applies to bacteriology, which has grown at such a rapid rate that, along with chemistry, a new chapter has been added to the study of factors which control reproduction in bacteria. A good foundation, therefore, in this basic medical science and its techniques is essential for any well-trained physician.

One of the chief problems connected with the medical curriculum is the place that should be given to the specialties. With the ever-increasing number of specialties, there is always a demand that a study of these subjects should form an integral part of the medical curriculum. The result has been that the undergraduate syllabus is overloaded with a miscellaneous variety of factors. In the anxiety to get the undergraduate to know something of the ever-increasing number of specialties the necessary time is not available for him to get a thorough grasp of the fundamentals of medicine and surgery and to become really familiar with the methods of diagnosis and of rational deductions.

Supervised Work

It is true that the amount of time devoted to didactic lectures has been steadily decreased, to enable the undergraduate to spend more time in supervised work with patients in clinical clerkships. Whether these clerkships are in the wards or in the out-patient department is not so important as the character of the supervision and guidance he receives from interested and inspiring teachers. The object of the clerkship is to provide an opportunity for a student to follow his case long enough to gain a lasting understanding of the natural history of the disease and the methods by

which it can be treated. With the rapid extension of laboratory tests of great accuracy there is a tendency to rely more and more on laboratory reports and less and less on the examination of the patient; the history of the illness, the family history, the environmental conditions, and the exercise of a wise clinical judgment. In many cases, of course, laboratory findings are required to arrive at correct conclusions, but the student must never be allowed to forget that the most essential consideration in arriving at a correct diagnosis is to study the patient in all his aspects and not to come to conclusions on laboratory tests. The laboratory must serve as a good servant and not be permitted to become the overlord.

As the student advances in his use of observation and deduction great help can be gained through conferences, seminars, clinical lectures, ward rounds, and case presentation by students themselves; these should all be regarded as essential elements of a well-conducted clerkship. Equally essential is it for the student to realize that the knowledge and experience of other professional and technical persons associated in the service of the patient are of great value. Nurses, medical social workers, dietitians, dentists, and others have a contribution to make to the students' better understanding and appreciation of the patient. The clinicopathological conference is the foundation of all educational progress for clinical clerks as well as for interns, residents, and the whole staff: it is at these conferences that the test of good and bad medical practice and teaching can be judged. There is no substitute for it so far as intellectual discipline and stimulus to professional improvements are concerned.

The Aim of Teaching

The aim of undergraduate medical education is not to provide training in the highly specialized fields of medical and surgical treatment but to give a thorough grounding in the knowledge and synthesis of general medical and surgical diagnosis. Let it be realized that undergraduate medical teaching serves only to lay the foundation for the creation of interest in a subject of ever-increasing complexity and to arouse in the student a psychological curiosity to develop the basic methods and principles that have been ingrained in him.

The successful medical practitioner is a perpetual student, and, in the light of the many developments that are taking place, thanks to the impact of the discoveries of basic sciences on medicine, it can easily be realized that it is not the knowledge of many unrelated facts but the analytical and the progressively expanding mind which will help the student to keep continually in touch with all receptive ideas in the field of science, particularly in its relation to medicine. The chief emphasis, therefore, should be on developing the student's broad understanding, scientific aptitude and approach, powers of accurate reasoning, judgment, resource, initiative, and a determination to put to test the knowledge that has been gained through study and observation.

It is from this point of view that the whole programme of undergraduate medical education should be reviewed. If specialization at the undergraduate level hinders the organization of a unified curriculum, if the curriculum tends to create any rigid barriers between basic medical sciences and the clinical instruction which should follow later, if it does not help to relate the education to the broader culture and science of the times both in the field of preventive medicine and in that of its social implications, then undergraduate medical education will have failed of its purpose. Medical students should be stimulated and inspired by modern concepts of social medicine to realize that they are responsible citizens of the future who should apply their profession, and the knowledge that they have gained, to the benefit of humanity.

An Interesting Period

One of the most important periods of a medical student's career is the period of internship. He looks forward to this with great interest. The intern is not burdened with

a schedule of classes and prospects of formal examination. He is free from the inhibitions of his undergraduate stage of study, and he has the joy of working with experienced clinicians and seeing how they combine the science and art of medicine in the treatment of their patients. The internship should strengthen and not weaken the student's appreciation of high scientific and ethical standards of practice. In the past, and as it still is in some schools, while the internship was regarded as a part of undergraduate medical education, it was almost entirely concerned with curative medicine. It thus failed in its objective, because internship, properly regulated, should contribute to a better appreciation of the possibilities of preventive and social medicine, and put the intern into closer contact with the life of the patient in respect of environmental conditions, his occupational hazards, and the manner in which he can be rehabilitated. The internship should therefore be utilized as an opportunity of studying community medicine in all its many ramifications through public and private agencies, and should serve as an experience in the practice of preventive as well as curative medicine, in community medicine as well as in hospital and in the out-patient department.

Conclusion

Thus it will be seen that no part of medical education is so important as that of the undergraduate, and, if the foundations are not well and truly laid, and the broad basis of the objectives of undergraduate medical education not thoroughly appreciated, the role that the future practitioner will be called upon to play will not be fulfilled and the usefulness of the trained doctor will be limited. Medical schools, the teaching profession in the faculties, and all concerned have to realize, therefore, the need for reorientation of the policy of undergraduate medical education, as indeed of all education in the field of medicine.

TECHNIQUES AND METHODS OF MEDICAL EDUCATION

BY

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It is an honour and a privilege, which I greatly appreciate, to preside over one of the sections of the First World Conference on Medical Education. I interpret this high distinction as one of the many indications that the medical profession is really one large institution, without geographical or racial barriers, making a generous effort to achieve a better mental and physical health for mankind. I have not the time to refer specifically to some of the techniques and methods which are actually used in or must be introduced into medical education. The distinguished list of contributors to this section, the variety of subjects to be considered, and the subsequent discussion which they will elicit are indicative that this important phase of medical education will be adequately investigated. It is almost unnecessary to say that our considerations will be closely related to those made in other sections. Methods and techniques are dependent, in part or wholly, on the premedical preparation of the students, the orientation and contents of the medical curriculum, and the new trends in preventive and social medicine. For these reasons it appears to be more pertinent, as a sort of introduction to our work, to comment briefly on the general aspects of the problems we face when we attempt to discuss medical education.

As a means of emerging from the widespread social unrest and poverty brought about or aggravated by the two great wars which divided the world into bitter factions, and in an effort to prevent the repetition of such catastrophes, international organizations and local governments are giving constantly increasing attention to the improvement of health conditions. It has become an accepted fact that man has the fundamental right to demand adequate protection against the development of disease and the best possible care when he is ill. Hospitals are being built all over the world, and new tendencies, such as socialized medicine, are attempting to solve the problems of preventing and curing illness. But there is little doubt that these efforts, justified as they undoubtedly are, lack in most cases the necessary basic foundation, which is the recognition that a good medical education is an essential factor for the successful accomplishment of health and social programmes. Large sums of money could be saved and a greater benefit obtained if Governments and the public were educated in the belief that a sound training of the men who will be immediately responsible for the effectiveness of such programmes was an essential requisite.

Need for Readjustment

It is not illogical to affirm that medical education must be regarded as a major health problem of a nation and must have a high priority in its solution. This is especially true in countries where educational standards fall below those considered to be acceptable. It is important to insist on the benefits of employing, as much as possible, local men in carrying out medical work in a given country. However, this major problem is not easy of solution. It has been repeatedly pointed out that medical education is in a transitional or critical period, and there is universal agreement on the urgent need of readjustment. Unfortunately there is not the same agreement on the way to bring about this readjustment. In reviewing the vast literature on the subject one is impressed with the emphasis with which every writer tries to uphold his personal ideas, and the writers and the ideas may be counted in hundreds and even thousands.

Several factors are apparently responsible for the present situation of uncertainty and confusion. Knowledge and understanding of them are necessary for the adequate evaluation of the methods and techniques which it is convenient to use in teaching medicine. These factors may be separated, from a general point of view, into the quantitative and the qualitative. To the first group belongs the tremendous advance in the knowledge related to the so-called basic sciences or preclinical courses. Some of these, such as anatomy, chemistry, physiology, bacteriology, and pharmacology, have long been accepted as part of the medical curriculum, and others, such as mathematics and physics, especially the latter, have given enough proof of their right to be included, at least up to certain degree, in such a group. In the clinical courses are included the great body of information which must be given to the students concerning the new concepts in psychiatry and social and preventive medicine; care of man when exposed to warfare; use of new therapeutic agents, including antibiotics, vitamins, and hormones, and the new surgical and medical procedures developed for the restoration of health.

From a qualitative point of view we have the close approach of preclinical to clinical courses; the interpretation of symptoms, signs, treatment, and prognosis in physiological terms, which introduces a dynamic rather than a static estimation of illness and its effects; the rapid development of an integrated concept in the consideration of the healthy and sick human body and mind, a concept which threatens to abolish the barriers between the classical departments and the time-honoured sequence in the curri-

culum; and, finally, the acceptance of the importance of considering the patient not as an isolated individual but as part of the family and society, from the points of view of both the consequences and the clinical peculiarities of the disease.

A Complicated Task

Thus the teacher of medicine faces to-day an extremely complicated task. He has to give to the student a constantly increasing factual knowledge within a period of time which has not changed for decades. One method followed is the elimination of certain facts in favour of others, either new or considered more important, within the general orientation that medical education cannot pretend to impart anything but the most essential material, leaving for the postgraduate period the acquisition of further knowledge, especially in what concerns the practical application of general principles. It is evident that this method of solution cannot go on indefinitely. It is based, in part at least, on a false premise, because it implies that new facts mean necessarily the elimination of previous ones. This is not always the case. Knowledge does not advance only by replacement; often it does so by addition. At the rate of our present advance in medical sciences it will occur, rather sooner than later, that the medical student leaves the school with only an elementary vision of what is necessary for him to know. Most medical educators are reluctant to consider a lengthening of undergraduate education. On the other hand, pre-medical training and postgraduate instruction have in recent years received a more liberal extension. One cannot escape the thought that the same consideration will probably have to be applied to undergraduate medical education, especially in those countries in which it is carried out in only four years.

Habits of Thinking and Reasoning

But the problems to be solved do not relate only to factual knowledge. Frequently, and with ample justification, it is indicated that the medical student must be taught the habits of thinking and reasoning, and the ability to discriminate on the relative value of the numerous contributions which are constantly being made to our knowledge. Some writers have extensively discussed the relative importance of these two aspects of medical education: learning facts and learning to think. Each has been given priority over the other. We must accept, however, that both are important, intimately connected, and dependent on each other. One cannot think and reason well if an appropriate body of knowledge does not back these intellectual functions.

The complexity of medical education is increased by the fact that its objective is not only the training of practitioners, either general or specialized. The medical school is the proper place for the selection and preparation of future teachers and investigators. This role is vital for the continuation of progress, for the necessary renewal of teaching personnel, and for the fulfilment of one of the most basic functions of a university, which is the undertaking of research. Everybody agrees that research gives to the teacher a greater authority and a better framework of mind for his thinking and makes him a greater inspiration to his students. But there is no uniformity of opinion concerning several points. How soon should the selected student be attracted to research? Is a limited investigative activity desirable in the curriculum? Is it convenient for the future teacher or investigator to enter early in the field of his choice, or is it better for him to acquire previously a general experience? What methods should be used to evaluate the future qualities of students? These and many other questions demand a closer study.

Conclusion

Medical education presents problems such as those briefly mentioned, which may be considered to be universal in character, which can be formulated in general terms, and which are apt to be applied wherever medical training is

carried out. But local conditions may complicate in a varying degree the solution of these problems. In most countries of Latin America, and possibly in some other regions of the world, an excess of students and economical factors complicate the picture. An erroneous concept of democracy has frequently opened the medical schools to all those who merely wish to pursue a medical education. The result has been the admittance of a number of students entirely incompatible with a high efficiency in the training, and this situation has brought about all the evils of mass education, in which the personal and highly useful contact between the teacher and the student is practically suppressed. The limitation of funds available for teaching and research makes difficult the introduction of the necessary reforms and the proper use of men adequately trained. In addition, geographical and social conditions are still responsible for large areas of inadequate medical and sanitary attention, which results in an uneven distribution of the graduates, who seek the large populated centres in which they find a better scientific environment for their professional activities.

Fortunately, facing these handicaps there is, in the medical school authorities and members, and in the medical profession in general, a sincere desire and a determined intention to raise the educational standards to the level found in those countries which have marked out the pathways in this field. These sentiments explain the presence in this meeting of men who have come from our distant continent. Allow me to conclude by expressing my confidence in the ultimate result of these deliberations, and my best wishes, participated in, I am sure, by all of you, for the success of this conference, which represents a united effort to raise the educational standards of our profession.

PREVENTIVE AND SOCIAL MEDICINE*

BY

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In the hospital as well as in private practice the physician deals essentially with sick people, so that the codes of ethics drawn up by the medical profession in the various countries define the doctor's duties towards his patient, not in a more general sense towards the person who consults him in health or disease. So had Hippocrates in the *Oath*, although elsewhere in his work he maintains that the first duty of the physician is to protect and cultivate health.

When, about a century ago, sanitation was revived and put mainly in the hands of the engineer, and when medical health officers were appointed, the doctor still served the cause of health by giving advice as family physician. Unfortunately, the advent of specialization has nowadays reduced the part played by the general practitioner.

Preventive medicine in the strict sense of the term—that is, preventive medical procedures—appeared with Jenner and his first immunization, followed a century later by the preventive examinations of pregnant women, infants, and school-children. Occupational medicine was launched by Ramazzini in 1700, medico-social surveys and statistics by Villermé in 1828.

In the century and a quarter which has elapsed since these pioneer days, preventive and social medicine—the terms are often used as synonyms for reasons of con-

*This paper was received for publication just before Professor Sand underwent an operation which prevented him from coming to London as one of the Vice-Presidents of the First World Conference on Medical Education. The news of his death was received as this issue of the *Journal* went to press.

venience—have proved their case, and if weighed against curative medicine would no doubt be found more effective and less costly. However, they occupy only a small place in medical teaching; and they come late in the curriculum, at a time when the student's mind is already monopolized by the clinical and laboratory aspects of disease. Besides, having had no instruction in the social sciences, he feels lost in a strange country.

Signs of Improvement

Here, as in so many other fields, institutions have lagged behind needs. Hospital and medical practice are still turned mainly towards cure. The Faculty is still made up of a large group of clinicians, a large group of laboratory workers, and a solitary professor of public health. Yet signs of change are appearing. The importance given to preventive medicine by the Report of the B.M.A. (*The Training of a Doctor*), and by the Goodenough Report, as well as by similar documents elsewhere; the creation of departments, institutes, and chairs of preventive and social medicine in various countries; the part assigned to these disciplines by W.H.O. and other international organizations—all point in the same direction.

If the social elements in many medical schools are still comparatively neglected it is because the training takes place in the hospital, from which these elements are absent, and because few members of the Faculty have studied social sciences and acquired experience in social work. However, a growing number of hospitals have almoners, and use them to demonstrate the circumstances and needs of the patients. Besides, the idea is spreading that a much greater part of the training should be given in the out-patient department and in the home itself, either by associating the students with the daily work of general practitioners, as Professor Crew does in Edinburgh, or by sending the students to observe domiciliary cases.

Need for Change

The lack of training in the social sciences calls for a radical change: in his first university year the student is taught mathematics, physics, chemistry, and biology, which are required for the understanding of health and disease; he should study also psychology and sociology, not only because he will need this initiation to play his full part as a doctor but because everyone, and more especially a university graduate, should understand himself and the world in which he lives. Biology teaches us to understand our body; psychology to understand our mind and our behaviour; sociology to understand the structure and life of the groups, small and large, of which we are members. So long as psychology and sociology remained mainly speculative their practical use was limited. More realistic to-day, they have become indispensable to the statesman, the employer, and the parent, to the judge, the Army officer, and the doctor.

On the background of biology, psychology, and sociology, acquired in the first year, the principles of preventive and social medicine should be taught at the same time as the basic sciences, anatomy, and physiology. The aim of medicine should be defined as the maintenance and culture of physical, mental, and social health, with the repair of damaged health as the second consideration only. The nation-wide and permanent achievements of preventive medicine and public health should be put in parallel with the remarkable but individual and temporary successes of curative medicine.

Later, when the student enters the hospital, the part played by social, economic, and occupational factors should be explained by the internist, the surgeon, the obstetrician, the paediatrician, the psychiatrist, with the help of the almoner, and preferably also of the professor of preventive or social medicine; and this teaching should take place in the clinical lessons, in the daily rounds of the wards, in the out-patient department, in the dispensaries and clinics, and in the home itself.

various faculties.* In Figs. 1 and 2 the distribution of Oxford medical students may be compared with the general distribution at two men's colleges, and in Figs. 3 to 6 students of dentistry and mechanical engineering at Birmingham are contrasted with those reading chemistry and physics. It will be seen that Oxford medical students and Birmingham students reading dentistry and mechanical engineering have one thing in common, they are largely mesomorphic. This is in sharp contrast to the physicists and chemists, who are largely ectomorphic.

These differences in preponderance according to faculty are summarized in the accompanying Table, in which further data may be found concerning undergraduates in the faculties of English, history, chemistry, chemical engineering, physics, and mathematics. In the left-hand part of the table the

Percentage Distribution by Faculties of Somatotypes: A, According to Primary Dominance; and B, According to Mesomorphic Rating.

Faculty	No	A			B	
		Endo-morphs	Meso-morphs	Ecto-morphs	Meso-morphic*	Meso-penic
		No. %	No. %	No. %	No. %	No. %
Oxford						
University:						
Medicine ..	29	5 17.2	17 58.6	7 24.2	23 79.3	6 20.7
History ..	48	9 18.8	14 29.2	25 52.0	17 35.4	31 64.6
English ..	29	5 17.2	10 34.5	14 48.3	12 41.4	17 58.6
Chemistry ..	21	3 14.3	4 19.0	14 66.6	7 33.3	14 66.6
Physics ..	29	5 17.2	10 34.5	14 48.3	17 58.7	12 41.3
Birmingham						
University:						
Medicine ..	70	10 14.3	33 47.2	27 38.5	42 60.0	28 40.0
Dentistry ..	29	5 17.2	17 58.6	7 24.2	23 79.3	6 20.7
Mech. eng. ..	26	4 15.4	13 50.0	9 34.6	20 76.8	6 23.2
Chem. eng. ..	36	4 11.1	15 41.7	17 47.2	16 44.4	20 55.6
Chemistry ..	41	5 12.2	10 24.4	26 63.4	15 36.6	26 63.4
Physics ..	36	5 13.9	11 30.6	20 55.5	15 41.7	21 58.3
Both Universities:						
Medicine ..	99	15 15.2	50 50.5	34 34.3	65 65.6	34 34.4
Chemistry ..	62	8 12.9	14 22.6	40 64.5	22 35.5	40 64.5
Physics ..	65	10 15.4	21 32.3	34 52.3	32 49.2	33 50.8
Mathematics ..	39	5 12.8	13 33.3	21 53.9	17 43.6	22 56.4

* Mesomorphic where mesomorphy was rated four or more, mesopenic where rated less than four, on the seven-point scale.

physical categories are those of primary component dominance, in the right-hand part physiques are divided into those with mesomorphic ratings of four or more on the seven-point scale, and those which may be described as mesopenic with ratings of less than four. This form of classification may bring to mind Tanner's (1952) finding that Oxford students are somewhat more ectomorphic and considerably less mesomorphic than American students.

Taking both universities together, it may be seen that half the medical students were primary mesomorphs and roughly

*The somatotype is expressed as three numerals, each a rating on a seven-point scale (seven being maximal and one minimal) of three so-called primary components of physique—endomorphy, mesomorphy, and ectomorphy. Endomorphy, in brief, represents roundness of physique and the capacity to become fat; mesomorphy describes the development of bone, muscle, and other tissues of mesodermal origin; while the rating on the third component, ectomorphy, indicates the degree of linearity of physique. The third component correlates positively and closely with the ponderal index height divided by the cube root of weight; it attains primary dominance in young adults when the ponderal index exceeds 13.5 (height in inches, weight in pounds). With ponderal indices less than 13.5, weight may be present mainly in the form of fat when endomorphy is primarily dominant, or mainly in the form of bone and muscle in the case of mesomorphs. The component rated second highest is said to be secondarily dominant. Thus, apart from shared primary and shared secondary dominance, the six main groups of physique are endomorphs, both mesomorphic and ectomorphic; mesomorphs, both endomorphic and ectomorphic; and ectomorphs, both endomorphic and mesomorphic. Sometimes it is more convenient to group physiques according to the weakest component, and this is indicated most concisely by speaking of endopenes, mesopenes, or ectopenes respectively. Alternatively the degree of endopenia, mesopenia, or ectopenia may be indicated by a statement of ratings included. For full details reference should be made to *Varieties of Human Physique* (Sheldon et al., 1940).

two-thirds of them had a mesomorphic rating of four or more. This feature no doubt underlies hospital Rugby football tradition. More than three-quarters of Oxford medical students and Birmingham dental students and mechanical engineers were rated high in mesomorphy. In contrast to this over half the chemists, mathematicians, and physicists were ectomorphs, in each case more than half being rated mesopenic. In view of this striking contrast between chemists (35.5% mesomorphic) and engineers (76.8% mesomorphic) it is entertaining to find that the distribution of chemical engineers lies half-way between that of chemists and that of engineers. Oxford English students and historians belong to the only other faculties tabled but so far unmentioned. In each case about half were ectomorphic and a slight majority mesopenic.

Task of Education

That completes the physical data to be presented here. But perhaps it is worth touching for a moment on the possible bearing this has on education generally. Perennial arguments more often than not are founded on temperamental differences. Where choice of faculty is concerned these differences have now been shown reflected in physique, and it is in this way probable that battles between science and humanism are perennially provoked. It is, for example, exactly along these lines that the whole success of university education in meeting present-day needs has lately been questioned.

In the House of Lords Lord Pakenham (1952) said: "The Government should consider how to broaden the outlook of the scientists and humanists. We have met the challenge of the scientific age in the wrong way. We have produced two nations—one of scientists, the other of non-scientists." The difficulty should, he thought, be tackled in the schools, and he sought to prolong all-round education during the first year at the university. Earl Wavell (1952) offered instead a mixed honours degree course as a solution to the problem. He said he was not concerned about the scientists who got a first-class honours degree. The solution would be to persuade two-thirds of those who obtained a second-class degree to read science, and he thought the time had come for the universities to do some strenuous thinking, and perhaps adapt their constitution to meet the new needs. Both speakers recognized special aptitudes, but both wanted all-round ability and interest as well.

It is therefore in order to ask two questions, in answer to which the somatotype distributions are not entirely reassuring. First, "Is there an adequate supply of central somatotypes with all-round interests and sufficient ability to satisfy demand?" If the central somatotypes cannot be "produced," then others must be persuaded to emulate them, and the universities should separately expose scientists to the genial humanizing enzyms of society, while adding scientific experiment and perhaps unpalatable precision to the diet of liberal arts men. This brings up the second question: "How effective is education likely to be in giving powers of leadership and managerial ability to mesopenic ectomorphs in whom these qualities are least often found, except possibly in academic surroundings; can education succeed in humanizing sociophobic ectomorphs who most often find easy personal relationships difficult; last, can teaching inculcate a scientific outlook in mesomorphs who, though capable as managers, are temperamentally less inclined to academic science?"

This is the task, and in both cases the genetic straw from which these particular bricks are to be fashioned will, like other raw material, greatly affect the final product. Should everyone try to climb uphill towards the central peak of university or universal education, or should impetus be added to inclination, should technical specialists be trained in their own institutes, and managerial students in theirs, with less confusion of purpose? Whichever line is taken it should be advantageous to recognize the nature of individuals who pass through the mills of syllabuses. At the present time it seems probable that too high a proportion of mesopenes

are chosen by the current machinery of selection to meet the national need for leadership in industry; after obtaining a university degree they not unnaturally prefer a niche with academic freedom to the more strenuous daily demands of industrial life.

Somatotype estimates of Oxford undergraduates were made while I was physician in charge of a pilot student health service at the Institute of Social Medicine, Oxford. Measurements on Birmingham students were made by kind permission of the senior university medical officer, Dr. R. H. Bolton, and I am indebted to his staff and to the following students who assisted me during the week of routine examinations: E. Anthony, J. A. Binnie, G. T. Brown, R. H. Cawley, H. R. Dobson, M. A. Harper, J. L. Pearce, M. G. Saunders, D. W. Theakston, G. B. White, G. T. Whitfield, and J. W. Woolley. My thanks are due also to Mrs. C. C. Standley and Mrs. S. McIntosh for their help in analysing the measurements.

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Medical Memorandum

Ileo-ileal Intussusception Due to Meckel's Diverticulum and Complicated by Volvulus

Any increase in the bulk of a segment of intestine may cause it to become twisted on its mesentery. Among the causes of this increase in bulk which have been reported as causing a volvulus are the ingestion of large volumes of cereal food (Kerr and Kirkaldy-Willis, 1946), the presence in the bowel of a mass of worms or some other foreign body, and a tumour of the bowel or its covering (Allen and Welch, 1947).

In the case reported below the increase in bulk was due to an ileo-ileal intussusception, the head of which had entered the ascending colon. The intussusception itself was caused by the invagination of a Meckel's diverticulum containing a polyp of gastric mucosa. Clark (1944) reported a similar case.

CASE REPORT

A schoolboy aged 9 was admitted to hospital complaining of abdominal pain which had started 15 hours earlier. The pain was situated to the right of the umbilicus and was of a dull and persistent nature; it had been mild at first, but had steadily grown more severe. He had eaten a meal after it started but with no enjoyment, and had been sick twice, bringing up small quantities only. The vomit contained the pulp of an orange which he had eaten 24 hours previously. The bowels had been open normally in the morning, and there was no disturbance of micturition. This was the first attack of its kind that he had suffered. There was nothing relevant in the past history.

On examination the boy was strikingly pale; his temperature was 97.4° F. (36.3° C.), pulse 90, and respirations 20. The tongue was moist but covered with a white fur; there was no fetor oris. He appeared to be most comfortable lying on his left side. The abdomen was not unduly fat, and a lump was visible to the right of the umbilicus. There was no visible peristalsis, respiratory movement of the abdominal wall was free, and acute tenderness and guarding were present over the lump, but not elsewhere. The mass, which was about 2 in. (5 cm.) in diameter, had a smooth surface and appeared to be bilobed; it was freely

mobile and slightly more resonant to percussion than its surroundings. No signs of free fluid were present in the peritoneal cavity, and bowel sounds, though reduced in quantity, were normal in character. There were faeces in the rectum, and blood was not found on the examining finger. No abnormality was found in the respiratory or cardiovascular system. Plain x-ray films of the abdomen in the erect and supine positions showed no significant abnormality.

The provisional diagnosis was not certain. The presence of a position of relief (Evans and Bigger, 1947) suggested intestinal volvulus, but intussusception was thought to be a possibility.

Operation.—The abdomen was opened through a right paramedian incision, and two purple, distended loops of intestine—one the caecum, the other a coil of ileum—presented themselves in the wound. The caecum and ascending colon were attached to the posterior abdominal wall by a mesentery 2 in. (5 cm.) long and, with the terminal ileum, were rotated on this mesentery through 360 degrees in a clockwise direction. This volvulus was reduced without difficulty and the bowel immediately resumed its normal colour. It was then found that an ileo-ileal intussusception was also present, the junction of the intussusciens and intussusceptum being about 6 in. (15 cm.) from the ileo-caecal valve, while the head of the intussusceptum was palpable in the ascending colon 1½ in. (3.8 cm.) above the base of the appendix. This intussusception was reduced with some difficulty, and it was found that there was a Meckel's diverticulum at the head of the inner layer. The invaginated intestine was deep purple in colour, and it became apparent that the proximal 3 in. (7.6 cm.) was not going to recover viability. The whole affected length was therefore resected and a side-to-side anastomosis made about 6 in. (15 cm.) from the ileo-caecal junction. The abdomen was closed without drainage.

Intestinal suction with intravenous fluid and electrolyte replacement was kept up for three days, at the end of which time peristaltic sounds became audible in the abdomen and an enema produced a good result.

The patient went home on the eighth day after operation. When seen one month later he was in good health, with the wound soundly healed.

The operation specimen was a length of ileum 12 in. (30.5 cm.) long. Apart from ½ in. (1.25 cm.) at each end, it was deeply congested with blood. At ½ in. (1.25 cm.) from the proximal end, on the antimesenteric border, was a diverticulum about 1 in. (2.5 cm.) deep and ½ in. (1.25 cm.) in diameter at the base. Arising from the interior of the tapering apex was a soft pedunculated polyp ½ in. (1.25 cm.) long and ¼ in. (0.6 cm.) in diameter. The microscopical report by Dr. John Dean stated: "Sections of small intestine show extensive haemorrhage into all coats. The polyp of the Meckel's diverticulum is covered by mucosa of gastric type with conspicuous oxyntic cells."

COMMENT

According to Harkins (1933) the mortality from intussusception due to Meckel's diverticulum is half as high again as that from the idiopathic variety. He attributes this to slowness in diagnosing the condition. The effect of the superimposed volvulus in the present case was to make the symptoms severe and the signs obvious, so that the need for operation was at once apparent.

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Reviews

MODERN UROLOGY

Modern Trends in Urology. Edited by E. W. Riches, M.C., M.S., F.R.C.S. With foreword by Lord Webb-Johnson, K.C.V.O., C.B.E., D.S.O., T.D., M.B., LL.D., F.R.C.S. (Pp. 476; 215 figures. 75s.) London: Butterworth and Co. 1953.

This book, edited by a distinguished urologist, is a most important work on this branch of surgery. The editor has made no attempt to produce a complete textbook of the specialty, but such have been the advances in the last few years in so many of the diseases constantly met with in urology that a book giving a full account of all of them must be almost a complete work on the subject. The discussion is not confined to those diseases which give rise to most problems and differences of opinion on their aetiology, pathology, and treatment, but the writers also fully describe those methods of investigation and treatment, including operative, which have been accepted in recent years as of especial value. The inclusion of the most recent work and the speed with which this book has been produced and published have overcome the main disadvantage of so many publications on recent advances in treatment—that much is out of date before the book appears. And, by no means the least important of its qualities, the book gives an account of the lines along which research is being directed and the trend this specialty is taking in its development.

The editor has shown great wisdom in the choice of contributors, several of whom are from overseas; each is an acknowledged authority on the subject he has written about. The large number of excellent illustrations and photographs makes the descriptions of techniques and operative procedures easy to follow. This book will be found of the greatest interest to all urologists as well as to general surgeons who wish to keep abreast of advances in this specialty.

J. E. SEMPLE.

MUCOSIS

Fibrocystic Disease of the Pancreas: A Congenital Disorder of Mucus Production—Mucosis. Edited by Martin Bodian, M.D. (Pp. 244; 133 illustrations. £3 3s.) London: William Heinemann Medical Books, Ltd. 1952.

This monograph by a team at the Hospital for Sick Children, London, represents 10 years' study of a disease that has aroused much interest in recent years. It is based on a series of 116 cases, of which 68 were fatal and 62 came to necropsy. Few pathologists can have had so large an experience of fibrocystic disease of the pancreas, and the authors have performed a useful service in presenting the fruits of this experience and in bringing together in convenient form all the more important facts and theories that must otherwise be sought among a large literature in the journals.

On the vexed question of pathogenesis, they present evidence in support of their conception of "mucosis" as the fundamental disorder, to which all the other lesions and manifestations are secondary. This is an inborn abnormality of mucus-secretion, in which all mucous glands may participate. The greater prevalence of mucous glands in the alimentary and respiratory systems accounts for the predominance of clinical manifestations referable to those systems. The pancreas is only one of many organs affected; the fibrosis, atrophy, dilatation of ducts, and loss of exocrine secretion are results of obstruction of small ducts by abnormally viscid mucus. The greater severity of the pathological changes in the pancreas than in other organs may be explained by release of intracellular enzymes from damaged acinar cells. The authors have found evidence of mucosis already present at birth in many mucus-secreting organs, and they believe that respiratory infection, which is so constant a feature of this disease, is dependent on

this abnormality of mucus-secretion and not on malnutrition due to pancreatic insufficiency. The importance of respiratory infection as a cause of malnutrition and death is emphasized, and an improved prognosis is expected from the use of the newer antibiotics, though not cure of the fundamental disorder. The study of familial incidence has produced strong evidence that the disease is genetically determined and transmitted by a recessive gene.

The book is beautifully produced and profusely illustrated from the authors' own cases. It is a valuable contribution to the literature of the subject.

A. R. MACGREGOR.

CLINICAL PSYCHIATRY

Clinical Psychiatry for Practitioners and Students. By Ian Skottowe, M.D., M.R.C.P., D.P.M. "The Practitioner" Series. (Pp. 395. 36s.) London: Eyre and Spottiswoode. 1953.

The sea of psychiatric literature is a stormy one, blown by contrary winds and moved by unfamiliar currents. So at least it seems to the medical man who would embark on it, and the many charts available do not always inspire confidence. For, like the charts of Columbus's day, they are apt to make up in conjecture what they lack in observation. There is always need for an up-to-date guide to the subject, written in familiar language and interpreting current trends with clarity and without bias. Dr. Skottowe's objective is to provide just such a guide for the physician, and there is no doubt that his common sense and facility for putting first things first will have a strong appeal. This is no mere compilation but a well-integrated account of the commoner psychiatric disorders and their treatment. The author, sitting on the sidelines of psychiatric controversy, has been able to take a broad view of the game, and his descriptions at times are reminiscent of Osler.

The book will be of particular use to newcomers to psychiatry whose first appointment is in a mental hospital, where opportunities for seeing the earliest manifestations of psychiatric disorder and cases belonging to the more specialized branches are limited. The method of presentation, founded on the writer's personal cases, contains much that is original, but there is little that does not seem natural or logical. The attitude to physical methods of treatment and their limitations is realistic, and the aims of psychotherapy are seen as an extension of the attitude of the physician to his patient rather than as a mystery beyond his capacity to know. There is a pleasing absence of prolegomena, and Dr. Skottowe goes straight to the heart of his subject. None the less his discussion, for instance of the view that psychosis is in the main of the same stuff as psychoneurosis, gives an opportunity to convey his attitude far better than an abstract approach would have done. This is an excellent introduction to psychiatry as it is actually practised and will be of use to student and postgraduate alike.

ALEXANDER KENNEDY.

VIRUS MULTIPLICATION

The Nature of Virus Multiplication. Second Symposium of the Society for General Microbiology held at Oxford University, April 1952. Edited by Sir Paul Fildes and W. E. Van Heyningen. (Pp. 320; 33 electron micrographs. £1 15s.) Cambridge: The University Press. 1953.

The concept of viruses as micro-organisms led logically to the belief that they multiplied by binary fission, and this belief persisted until quite recently, when apparently contrary evidence has led to its being abandoned. It is true that the agents belonging to the psittacosis-lymphogranuloma group, which from their size and the readiness with which they stain lend themselves to study by means of the ordinary microscope, appear to multiply by the simple process of division. But by almost common consent they have been removed from the Virales and placed with the Rickettsiales, where their orthodox reproductive behaviour can no longer disturb the harmony in the virus group. For there are other views to-day on how viruses multiply, and

they are described and discussed in this book. These new concepts have been derived very largely from investigations made with the bacteriophages—or bacterial viruses as they are often called—which have been chosen for this purpose because of the ease with which they and their hosts, the bacteria, can be handled in the laboratory. It is hardly surprising, therefore, that a consideration of bacteriophage reproduction should have occupied such an important position in this symposium. S. E. Luria, André Lwoff, Raymond Latarget, J. K. S. Boyd, Sir Paul Fildes, and his colleagues D. Kay and W. J. Joklik, all eminent in this particular field of research, contributed papers which now appear in this volume.

There seems to be general agreement that in the early stages of bacteriophage multiplication there is a replication of non-infective sub-units which are subsequently reassembled to form the complete fully virulent phage. And investigations made with influenza virus have led to very similar conclusions. L. Hoyle, who has been responsible in this country for much of the work on the reproductive behaviour of this virus, describes and discusses the evidence. A finding which has been common to these investigations, whether made with the bacteriophages or the influenza viruses, has been the disappearance of infective virus during the early stage of the reproductive cycle. Shortly after entering the cell, and for a period of time which has varied with the virus under study, it has been impossible to recover infective virus from the cells. It is during this latent or eclipse phase that the virus is thought to be multiplying in the form of non-infective sub-units or provirus, and it is on the existence of this incomplete form of the virus that the belief in a complex growth cycle largely rests. In a most interesting article Forrest Fulton discusses critically the evidence for a complex growth cycle, and concludes that the hypothesis is far from being established. He is of the opinion that it may well be shown eventually that viruses and bacteria multiply by essentially the same procedure.

Many other aspects of this most interesting subject are considered in this volume. Among these are the fundamental ones of protein synthesis and of nucleic acids in virus multiplication, the metabolic aspects of this problem, and the multiplication of insect viruses. This book will be of interest and value not only to virus workers but to the greater circle of microbiologists as well.

S. P. BEDSON.

GUIDE TO PARASITOLOGY

A Guide to Human Parasitology for Medical Practitioners. By D. B. Blacklock, C.M.G., M.D.(Edin.), D.P.H.(London), D.T.M.(Lpool.), and T. Southwell, D.Sc., Ph.D., A.R.C.Sc., F.Z.S., F.R.S.Ed. 5th edition, revised by T. H. Davey, O.B.E., M.D.(Belf.), D.T.M.(Lpool.). (Pp. 228; 3 coloured plates and 120 illustrations in the text. £1 5s.) London: H. K. Lewis. 1953.

This well-known textbook has been revised by Professor T. H. Davey to bring it into line with modern knowledge. It remains, however, a guide to clinicians and those taking courses in tropical medicine or public health. Professor Davey has added a note on prevention to the account of each parasite, and has included or expanded notes on several parasites without altering in any sense the essential character of the original text.

With its many practical expositions and forthright advice it is of undoubted value to the general practitioner, who will require to be told what to do rather than find nice opinions on the best means of doing it. In this the initial chapters on parasitological technique excel. The instructions are precisely set forth in the manner most easily understood and accomplished by the tiro.

The omission of flagellate-culture methods seems a mistake, for the text mentions them as a diagnostic method for *Leishmania*. It is also hard to understand the preference for the more difficult of the Romanowski stains over the almost foolproof Giemsa stain. The morphology and life histories of the parasites are set out clearly and with a commendable economy, and their chief distinguishing fea-

tures are enumerated in that most useful of guides, the diagnostic table. Parasitology is taken to include the spirochaetes, the protozoa, and the helminths. One surprising omission is made. While a short note is accorded to *Sarcocystis*, no mention is made of *Toxoplasma*. If the latter has been relegated to the mycologists, surely the position of the former must be in grave doubt.

A parasitologist might rashly desire to expand certain descriptions, but when the purpose of the work is recalled it is left only to congratulate Professor Davey on retaining the essential morphological simplicity of the original text in the face of the multiplication of our knowledge of the biology and physiology of these parasites.

R. S. BRAY.

THE SPINAL CORD

The Spinal Cord. A Ciba Foundation Symposium. Consulting Editors: J. L. Malcolm, M.B., Ch.B., B.Med.Sc., and J. A. B. Gray, M.A., M.B., B.Chir. Editor for the Ciba Foundation, G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., assisted by Jessie S. Freeman, M.B., M.S., D.P.H. (Pp. 300. 112 illustrations. 30s.) London: J. and A. Churchill. 1953.

The Ciba Foundation during the past four years has arranged a number of symposia to which distinguished workers from Britain and abroad have been invited, and has published the papers and subsequent informal discussions with a minimum of editing. The occasion for such a meeting to discuss present-day problems in the physiology of the spinal cord was the presence in England of Professor J. C. Eccles, and this book contains the proceedings of the meeting, which was attended by about 50 research workers. The 20 papers are on various controversial topics in the neurophysiology of the spinal cord and nerve roots; they include two on the action of anticholinesterases, and one with a direct clinical bearing on nerve conduction in poliomyelitis. The discussions seem to have been lively and provocative. This volume should be of value to those doing experimental research in neurophysiology, but it is difficult reading for the clinician.

J. W. ALDREN TURNER.

REPORT ON STRESS

Second Annual Report on Stress. By Hans Selye, M.D., Ph.D.(Prague), D.Sc.(McGill), F.R.S.(Canada), and Alexander Horava, M.D.(Lausanne). (Pp. 526. \$10.) Montreal, Canada: Acta, Inc. 1953.

This volume is the second of a series of annual supplements to the book *Stress (The Physiology and Pathology of Exposure to Stress)* by Professor Selye. An additional author, Dr. Alexander Horava, is now responsible for this annual publication. The same general form as in the first *Annual Report* is preserved. The first section of the book is on the stress concept as seen at the moment; it includes the principal objections to the concept, definitions and terminology, and data on "stressor agents and adaptive hormones." The second part is on the special physiology and pathology of stress and is arranged according to the various systems and functions of the body.

This volume is notably different from its predecessor and has become to a large extent a classified index of literature pertinent to the subject of stress. Pp. 40-300 consist largely of such classified data, description having been reduced to a few introductory paragraphs and comments through the various sections. The book gives an up-to-date account of Selye's views on the general adaptation syndrome and the so-called diseases of adaptation. It also makes available the benefits of the extensive library in the Montreal Institute. Some 5,000 papers, published mainly in the course of the last two years, have been covered in this way. It may be recommended as a reference source to the extensive literature that has grown up around the subject of stress and pituitary-adrenal reactions. Though expensive it is very well produced, and should be available at least in the libraries of all medical institutes.

G. W. HARRIS.

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FIRST WORLD CONFERENCE ON
MEDICAL EDUCATION

By the time this issue of the *Journal* is published the First World Conference on Medical Education will have all but come to an end. Those responsible for planning and organizing it will be all too uncomfortably aware of the mistakes and the shortcomings, of the occasional creaking in the machinery, of the rough edges in the programme. A series of accidents in the early phases of the work of the Conference last year worked to the disadvantage of those upon whom the responsibility ultimately fell. But under the guidance of Sir Lionel Whitby, who took charge of the situation just a year ago, most of the difficulties were overcome, except that the time lost in preparation was something that could not be recaptured. A conference such as this had no precedent to guide it, no set of "recent advances" round which to crystallize discussion. Of course the pattern of medical education—a pattern worked on throughout the centuries—was bound to determine the shape of the Conference.

What was said during the past week will be recorded and summarized in the *Proceedings* to be published by the Oxford University Press, and reported more briefly in this *Journal* and in many others. The *Proceedings* will, we believe, be an important addition to the documentation on medical education. Many excellent reports on this question—such as those of the Goodenough Committee, of the Royal College of Physicians, of the British Medical Association—may turn out to be more of a piece, more definite in direction, less disturbed by divergencies of view. They represent the majority opinion of a group of experts and witnesses. They are neat and tidy. But the *Proceedings* of this week's Conference will lack this neatness and tidiness, will not erect what appear to be irremovable signposts, will refreshingly fail to seem to utter the last word on a subject perennially fresh and challenging. This week's Conference was a public debate on medical education at which individuals said what they thought about this or that. Ideas have been thick in the air, and some of them will settle in suitable soil. Ideas have a great force:

they effect a change in men's thinking, and at no time more than at the present was such a change needed in medical education.

Those who look for the short cut to higher education in the outcome of this week's work will be disappointed. But the stimulus to thought, and so ultimately to action, is there. What Sir Richard Livingstone, in his address on Monday, called "the philosophy of the first-rate" must permeate medical education and influence the choice of men and women who teach the young and fill the positions in medicine which fashion the future. In an age when a spurious egalitarianism is preached, when the collective mind is thought by some to have virtues superior to those of the individual mind, Sir Richard's philosophy comes as a necessary challenge. In an age of safety first—the welfare-state age—the mediocre is elevated, and the second-rate and the third-rate seep upwards to dilute what is first-rate, and debase the coinage of thought and intelligent intercourse. As Sir Richard Livingstone puts it: "People learn what is first-rate by contact with it." That is what is needed above all in medical education—and any kind of education. The character of a headmaster will affect generations of young men. As Emerson put it, "An institution is the lengthened shadow of one man." The student learns something incalculable when he comes into contact with the first-rate; and the first-rate is uncommon and appears in unexpected places. This is something that no one can provide deliberately, produce to order. But if the idea is there, if the ideal is kept bright, then more and more people—teachers and students—will be discontented with the second-rate.

What is a first-rate quality in the practising doctor is not necessarily a similar quality in a research worker, in a lawyer, or in an archbishop. But archbishops are rare and doctors are common. Yet the qualities Sir Lionel Whitby spoke of in his presidential address as desirable in the student and so in the doctor are not common; but they are qualities, he observes, that must be looked for in the selection of students—a subject thoroughly discussed this week. Sir Lionel opposes any narrow view of the objective of undergraduate medical education; and surely he is right if we as a profession adhere—as we try to adhere—to Sir Richard Livingstone's "philosophy of the first-rate," and are guided by this in the choice of students. The aim of the teacher is admirably summed up thus by Sir Lionel:

"The undergraduate teacher should aim at producing an educated person grounded in principle and method, able to see what the whole of medicine stands for and

means, trained to observe with his hands and his senses, encouraged to think logically and critically, instructed in the use of the instruments of measurement, and equipped with a basic knowledge upon which he will continue to build for the rest of his professional life."

To do all this the teacher of undergraduates must himself be an educated person, and it would be unwise to assume that this is always the case. Teacher and taught will find a basic language of communication only if they have drunk deep of the Pierian spring, if their ears are attuned to the overtones of the civilized mind. And it was significant that many speakers in the plenary session on Monday and in the discussion on "General Education in an Age of Science" on Tuesday underlined Sir Richard Livingstone's dictum that "an education which ignores the humanities is disastrously incomplete." Once qualified the practising doctor cannot hope—and does not want—to live a life of lettered ease; but what ease he may find can be enriched if as a boy at school he has been given a glimpse of the treasures of human thought and emotion. Only if his mind is so rounded off will he be to his patient something more than an applied scientist. One sees in all this a check and balance to the laboratory, a reaction against intense specialization, a swing back to the more simple observational art of the clinician. To strike a balance between the old and the new, between the art and the science, to achieve the Greek mean of "nothing too much," to use wisely the probing weapons of modern science and technology in seeking out the causes of disorders of the body and mind calls for a combination of scientific scepticism and human compassion occasionally brought to perfection in a character such as William Osler's. And the guide to this is Sir Richard Livingstone's "philosophy of the first-rate."

It may be that the study of the classics is on the wane, and the schoolboy and schoolgirl are no longer so drilled in the grammar of Latin and Greek as their parents, or at least as their grandparents were. And if the stripling no longer learns to decline the Latin for "table" and the Greek for "youth," he is being taught that history is something more than dates and the deaths of kings and queens. The historian a thousand years hence may see civilization to-day as a phase of the Socratic era, and the specialist then in medical history may, in exploring the archives of our minute of historical time, note that in the First World Conference on Medical Education Professor John Fulton and Colonel S. M. K. Mallick expressly devoted their attention to the impact of the past upon the present, to the continuity of our uneven medical story.

A SIGHT OF GENERAL PRACTICE

In most teaching centres in Britain it is only very recently that the undergraduate curriculum has been designed to include some preparation specifically for general practice. Some still offer the student nothing, though one pioneer—namely, Edinburgh—has for many years given practical instruction in the conditions likely to be met with beyond the hospital gates. Most teaching hospitals provide at least lectures and sometimes even the opportunity to live in a general practitioner's family for a week or so, and an inquiry carried out recently by Mr. R. W. Heslop for the British Medical Students Association shows that those medical schools not yet giving instruction in general practice have a slightly hang-dog air and promise schemes soon or when they have studied the problem further. There is little doubt that some such instruction is to the student's benefit; at any rate the B.M.S.A. finds that students themselves welcome it.

When the G.M.C. forbade the employment of unqualified assistants in 1891 it brought to an end the apprenticeship as one method of gaining the requisite knowledge for qualification. Perhaps that was no great loss, for Dr. Alfred Cox, who himself entered general practice that way, has recorded¹ that many of those dispenser-assistants were grossly exploited and few of them ever qualified. With the passing of apprenticeship and the coming of recondite specialization in so many branches of medicine, however, many young doctors have felt much anxiety on first entering general practice—not only because they know little of the organization of general practice, for that is to be expected, but because they know so little even of the maladies their patients bring to them daily. Too often the disorders receive scant mention in the textbooks, examination papers, or hospital wards, and they should be among the principal subjects of such teaching as is given. Introducing the results of its survey, the B.M.S.A. states its belief "that it is desirable for a medical student to see how a general practitioner lives and works." No doubt it is, but the emphasis needs slightly changing lest students waste valuable teaching time in treating their visit to the general practitioner much as they might a visit to the Zoo. In the avoidance of this danger the important work of Edinburgh² is an example that other medical schools could study with profit. Arrange-

¹ *British Medical Journal*, 1950, 1, 77.

² Scott, R., *Lancet*, 1950, 2, 695.

³ *British Medical Journal*, 1953, 1, 36.

⁴ *Ibid.*, 1952, 2, 490.

⁵ *The Training of a Doctor*. Report of the Medical Curriculum Committee of the B.M.A. London. 1948.

ments that had existed for over 100 years for teaching in dispensaries were replaced in 1948, as a consequence of the Health Service starting, by a teaching general practice. The emphasis here is on teaching. The student learns much about the ailments often to be met with in general practice, what patients first complain of, and what they have to contend with if they remain at home instead of going into hospital, and they also learn about the special agencies, such as those run by the local authority, for helping the sick, the pregnant, the destitute, and so on. The Americans seem to have gone beyond even such a considerable scheme as this with their home care programme at Richmond, Virginia, and their home medical service at Boston, described respectively by Professor Kinloch Nelson and Dr. James M. Faulkner at the First World Conference on Medical Education this week. Both schemes operate in large indigent populations without family doctors, and the main feature of both is that the medical students go out to the homes in response to calls received at a centre. They remain in touch with their hospital readily enough in case of emergency—in one scheme by wireless—and are well supervised at a distance. These arrangements are thus very similar to those by which students in Britain often learn their midwifery, though the lack of large doctorless populations here precludes our developing anything quite like them.

The College of General Practitioners has rightly said³ that "an insight into the nature of general practice, and some first-hand experience of it, form an essential part of the basic training of all doctors, whatever their future may be." And of interest here is the Edinburgh insistence that the students least likely to end up in general practice are those who above all receive special instruction in it. Some acquaintance with the best type of general practice—and Barber⁴ has emphasized that this first vivid impression must be of the highest quality—will moreover do something to offset the dependence on intricate mechanical equipment that the student almost inevitably acquires in his long peregrination through wards, theatres, and laboratories—from which perhaps he will ultimately emerge only to practise in a small private house on the outskirts of a market town. His medicine need not be the less scientific there, but it probably will be if his medical school did not teach him something about applying scientific principles in the kind of practice he will experience.

General practice nowadays demands "appropriate postgraduate study"⁵ such as in an assistantship, and no amount of undergraduate instruction can of itself fit a man for it any more than it can for other kinds of practice. Indeed, it would be undesirable to design a curriculum aimed at producing a certain kind of

doctor. The introduction of the intern year and of the trainee assistant scheme in the National Health Service is a recognition of the need for practical experience after qualification but before the assumption of full clinical responsibility. Consequently advocates for teaching undergraduates about general practice may, without tempering their enthusiasm, at least moderate their demands on the curriculum. A helpful view is the B.M.A. Committee's⁵ that "the undergraduate medical course should be primarily concerned with the training in those basic principles of medicine which are a necessary foundation for all forms of medical practice." Certain basic principles are exemplified particularly in general practice. Being on the alert for the early diagnosis of many diseases—pneumonia, for instance—is one. And to continue trying to teach these principles entirely from hospitals is to put an unnecessary strain both on the curriculum and on the student's imagination.

INDUSTRIAL HEALTH AND THE UNIVERSITIES

The first university department of industrial medicine in Great Britain was set up in Birmingham in 1935 and closed down after four years. Undeterred by this experience the Nuffield Foundation later established chairs of industrial health in Manchester and Newcastle, and a subdepartment under the professor of public health in Glasgow. The grants, which were to be spread over ten years, are beginning to run out, and the universities will soon have to decide what the future of these departments is to be.

The generous contributions of the Nuffield Foundation and the formation of a Social Medicine Research Unit by the Medical Research Council and of chairs of social medicine in the universities of Oxford, Edinburgh, Birmingham, and Sheffield were all signs of a progressive policy, inspired by the war, to promote research and teaching in social and industrial medicine. But the outlook to-day is not so bright as it was. The public health services are now in the doldrums and the expected development of industrial health services has not taken place. Consequently fewer doctors are taking the D.P.H. with the prospect of practising in this country, and the D.I.H. courses have ceased at Glasgow, Edinburgh, and Manchester. In fact very few university departments of social and industrial medicine can at present be justified by their postgraduate teaching, and with the need for economies in university expenditure on medical teaching and research these new departments may be the first to feel the knife. The Institute of Social Medicine at Oxford has already had its scope considerably reduced.

If cuts in expenditure are inevitable, then there is a case for spreading them out as fairly as possible. The place that departments of social medicine and industrial health should occupy in undergraduate training is far from unimportant: by teaching a discipline demanding a broad approach to the aetiology, prevention, and treatment of disease they can do much to counteract the effects of overspecialization. In this connexion it is surely significant that one of the four principal sections in this week's Conference on Medical Education was devoted to a consideration of the teaching of social and preventive medicine. In his contribution on the teaching of occupational health Professor A. J. Lanza, of New York University, described how the universities and medical schools in the U.S.A. are attempting to fit this relatively new subject into the curriculum.

The light burden of formal teaching, particularly in industrial health, gives departments of social and industrial medicine special opportunities for research: and it is only on the results of research that industrial health services, together with such teaching as there is, can be well founded. Professor R. C. Browne's report¹ of the first five years' work of the Newcastle department of industrial health shows the great opportunities which these departments could have for helping local industry, as well as advancing knowledge. The industrial area of Newcastle, with its large mining community and shipyards, has many serious industrial health hazards—such as miners' nystagmus, pneumoconiosis, and accidents—which Professor Browne and his colleagues have studied. They have also in the smaller industries investigated less serious problems such as dental erosion from tartaric acid dust and the toxicity of cadmium stearate used as a plastic stabilizer. These latter studies, which offer more hope of immediate results than those of miners' nystagmus and pneumoconiosis, can provide an excellent training in research methods for the less experienced; and they might well encourage local industries to support these departments financially. Although the Medical Research Council has at least ten units engaged principally in industrial health research, these have to serve national interests and cannot be expected to deal with the local needs of industry. But the universities, with a tradition for giving intellectual leadership to their communities, should be in a position to meet these needs, and they should not without careful thought cease their support for work which cannot or will not be done readily by anyone else.

The university departments, through their close contact with the medical schools, must attract those

who can be trained to do research. Failure and unsatisfactory results must be expected while the quest continues for new research methods, especially needed in the social and psychological studies of groups of industrial workers. Professor Aubrey Lewis² has mentioned the methodological difficulties of this type of work and emphasized that these researches still necessarily fall far short of the neatness and precision of a laboratory experiment in the physical sciences. The universities have a great chance, not apparently being taken by the Medical Research Council or the Factory Department of the Ministry of Labour, of initiating "operational" research, such as experimental industrial health services for groups of small factories. It is not yet known to what extent it is necessary, and practicable, to provide these services for the smaller workshops. If there is to be a comprehensive industrial health service it should be based on evidence and experience rather than on opinion and fantasy, and the sooner there are more of these experiments the sooner will industrial health services continue the development which started during the war and which has since largely lost its impetus. It would be most unfortunate if for economic reasons other departments of social and industrial medicine suffered the fate of the Oxford Institute of Social Medicine at a time when they can guide and encourage public and industrial health services in one of the most difficult periods of their history.

TRAINING IN METHODS OF RESEARCH

"The spirit of science is self-critical and self-corrective," said Dr. Chauncey D. Leake at the World Conference on Medical Education this week, and he might have said that the same spirit should imbue the practice of medicine. But how this spirit should best be set before undergraduate students is debatable. Nowhere are these qualities better exemplified than in experimentation. Yet everyone would agree with Dr. Gustav Nylin that "the introduction of an additional subject, 'Scientific Methods,' would be inexpedient," for such methods are better learnt by precept and practice than as a subject with its inevitable accompaniment of textbooks and mnemonics. But students might well be given some instruction in statistics, as Professor Bradford Hill suggested. This term, so forbidding at first sight to many people, shows a friendlier countenance when Professor Hill outlines what he has in mind as "a short elementary course . . . requiring no mathematical ability and designed to familiarize the students with statistical ideas and the most commonly used elementary methods." He would rightly add some instruction in the use of that great repository of national statistics collected by the Registrar-General. Dr. P. Bonnevie, supporting Professor Hill's ideas, added that in his opinion undergraduate medical education ought to

¹ First Quinquennial Report, Nuffield Department of Industrial Health, University of Durham.

² *Edinb. med. J.*, 1951, 48, 214.

be "statistically-minded throughout the whole curriculum." Perhaps the phrase hinted rather at special pleading, but many would agree with him if he meant that students should be taught, first, the importance of exact measurement and enumeration, and secondly how all measurements are, to a greater or less extent, at the mercy of chance. For the once immutable normal values and natural laws seem to have dissolved into unpretentious averages.

The benefits of some kind of research as a part of medical training were also to the fore in the lively conference¹ on the technique of medical teaching held earlier this year at the Postgraduate Medical School, London. Professor Rosenheim expressed the opinion that every registrar should be given a research problem, however simple, and he made the important point that a registrar seconded for research should not, if ultimately found unsuited to it as a career, feel that his time had been wasted; on the contrary, he should be enlightened and stimulated. The old argument about whether a teacher should hold his post by virtue of his impressiveness as a teacher or his brilliance as a research worker is relevant here, for it is not only registrars who will be refreshed by contact with research. Professor W. Melville Arnott was able to tell the World Conference this week that "one of the most vitalizing influences on medical education . . . has been the increasing emphasis on practical research experience" as a qualification for teaching. Imaginative lecturing is a delight and a benefit to students, but, if given in a medical school where research is apathetic or secluded, it is unlikely to implant in the students' minds that inquiring, sceptical, judicious enthusiasm for the science of medicine without which its art is pastiche.

As the techniques of scientific investigation have multiplied there has grown up a tendency to look on research as something rather remote from practical medicine, even esoteric. Yet, as Sir Cecil Wakeley² said last year: "The essence of clinical research is that it is carried out by a clinician," and the general practitioner "has far better opportunities for studying and recording the natural history of disease than any other man." He outlined various reasons, well known to family doctors, why any kind of scientific inquiry is often beyond them, and suggested remedies. And perhaps the newly founded College of General Practitioners will be able to provide them with just the help that many of them need to observe and record systematically the innumerable facts and problems of medicine at present escaping attention. In addition they—and indeed all clinicians—may soon look hopefully to the Clinical Research Board to be set up jointly by the Medical Research Council and the Government Health Departments.³ It is to provide funds and guidance for the investigation of clinical problems, and of these there are very many both common and pressing which, as Professor Robert Platt has pointed out,⁴ are entirely neglected—and incidentally he threw out many fertile ideas for research into them. Again, to the improvement of clinical science that such inquiry would bring must be added the pleasure of

carrying it out. If doctors are to remain something more than those signposts to hospital departments that some have complained of in recent years, a certain amount of training in the methods of research when students or housemen will help them to keep their vision fresh.

HUMOUR IN MEDICAL EDUCATION

The treasury of medical humour is richer and more often raided than that of any other profession. It is cynical, boisterous, only occasionally smug; it lies beyond the finger of prudery; its true standard of drollery is high, judged by the impact of jokes understandable to the general public; and it has the praiseworthy quality of rarely laughing at a patient but usually at the befogged doctor or student.

The trudge of the student towards qualification is lightened by this warm humanitarian humour as much as the path of Chaucer's pilgrims to Canterbury. The medical students in literature are rightly a pack of gay dogs—Roderick Random, Silly Barney, Jack Hopkins (with his remarkable case of the rattling child). Raskolnikov could never have been studying medicine. Humour flourishes in medical schools, most easily in the hot and arid climate of the lecture-room, where the mildest witticism is seized gratefully by students struggling against fierce gusts of information. The gay lecturer is remembered more easily and probably longer than his solemn colleague; a simple test for the former anatomy student is to recall the convolutions of the lingual nerve round Wharton's duct, and then try to remember structures lying in more proper relationship.

It is unnecessary to labour the value of humour in teaching, for the humourless man can never bring himself to crack a joke and the humorist finds his large, impressionable, and captive audience always irresistible. A few entertaining teachers possibly dilute their instruction with reminiscence instead of spicing it, and would be better if disciplined into a middle course—like Mr. Eric Linklater when he taught English literature. His classroom lay above that of his fierce senior, who swept angrily to the door, "a galleon under sable canvas," to complain either when Mr. Linklater's brilliance sprang a roar of laughter or when his flatness brought the students drumming on the floor with their feet.¹

Humour from the lectern depends largely on the character of the lecturer, some of whom build up a public personality as painstakingly as a politician. Former physicians beguiled their students into learning medicine with displays of cleverly controlled eccentricity, and surgery has been taught most effectively by the apparently bluff and ruthless operator. A uro-genital surgeon, now dead, characteristically began discussing a case of haematuria with the memorable cry, "A glass of bloody water, gentlemen!" And, when the surprising diagnosis was later made by his assistant exclaiming from the cystoscope that there was a clinical thermometer in the bladder, the dressers were impressed

for ever with the necessity of surgical calm by his snapping from the scrubbing-up basins, "Then what's the temperature?"

Modern medicine is becoming precise and prosy, and the "characters" that strode so largely down the stony Edwardian corridors have disappeared like E. F. Benson's pleasantly cranky Cambridge dons. Students now rarely force themselves to learn medicine by skilfully imitating their chief—down to his last gesture and aphorism—amid a delighted circle in the saloon bar. Some subjects still lend themselves irresistibly to lecture-room humour—obstetrics, for example, where the single-handed problems of birth may be stamped on the student's mind by presenting them in outlandish surroundings, so that he sees himself sharing a rowing-boat with a woman in labour, or galloping by camel to attend a tented delivery in the alarmingly under-doctored stretches of the Sahara.

The value of "audience participation" has long been sensed by good lecturers, for every class, like every squad of recruits, contains one "funny man" eager for distinction by becoming the lecturer's butt. "Tomkins will tell us," repeated whenever the whole class is shamefully baffled brings a laugh as surely as a B.B.C. comic's catch-phrase; but it is just and agreeable that Tomkins should sometimes score off his flagellator. A nervous lecturer may disregard his audience, as an edgy golfer is said to ignore his opponents in a championship. Another has only one joke, which is yearly relished by his students and is often all they remember of him for the rest of their lives.

Medical humour fortunately appears rarely in textbooks: writing humorously is a serious pursuit, and the amateur's jokes freeze and perish in the coldness of print. But the anecdotal footnote is an admirable tag for identifying a drab bundle of facts. It is no disrespect to Professor Samson Wright to remark on the number of readers of his textbook who can recall the scholar of the twenty-four privies, and the amorous management of the odour from the axillary sweat-glands.² An extended witty dissertation is a *tour de force*, and few medical writers are capable of it. A remarkable example is James Bridie's essay on the umbilicus, which Fellowship candidates or idler readers should seek out in a former issue of the *Journal*³ as an ideal of polished information and smooth medical humour.

INSURANCE HELPS

With income tax at its present level few doctors can afford to pay boarding-school fees for more than one child at a time out of their ordinary yearly earnings. In round figures it will be necessary to find about £1,500 per child during the public school period and a further substantial sum for the university or medical school years. If there are two or more children to educate at the same time then the family man must make an early decision on the style of education he desires for his children and on the measures he proposes to adopt in order to provide fees at the appropriate time. Many schools will take a lump sum in commutation of fees, and, broadly, if £100 per annum can be set aside from

the birth of the child to the age of entry into a public school the total so provided will be sufficient to meet the school fees.

Insurance companies have designed special educational policies to help parents, and these policies have the advantage of offering some relief from income tax. The policy is usually arranged on the life of the father, and thus school fees are secured even in the event of his death. A typical contract would provide £100 (or multiples thereof) per annum for five years, beginning when the child is 14, for an annual premium of £31, assuming the policy was effected at the birth of the child and the age of the father was 32. Tax relief on this premium at current levels would be £5 12s., making the net annual cost £25 8s. If the parents hope to send the child to a university, then the term of the policy can be lengthened as desired with a corresponding upward adjustment in cost. Another benefit which can be incorporated in an educational policy is a maintenance payment, if the father dies at an early age, until the school fees become payable.

Policies of this character go some way to meet the difficulties of paying for children's education, and there are other types which provide for the needs of the child in the more distant future. All such policies can be arranged to suit individual wishes, but it is always as well to seek expert advice—for instance, from the Medical Insurance Agency—when such a policy is under consideration.

COMMISSION IN THE ISLE OF MAN

The Isle of Man is well known as a holiday resort. One of its charms in this respect may be a local habit of mind which, when translated from the native Gaelic, means "time enough" or "to-morrow will do." That this outlook can also infect serious affairs less happily is evidenced by the story told in this week's *Supplement* on p. 83. A body, called a Commission, appointed by the Manx Government to consider an economic principle of some intricacy and with many attendant implications, seems to have set about its business with little appreciation of how to treat an important national association which asked to give evidence. The Secretary of the Association is to be congratulated on producing at such short notice the memorandum printed in the *Supplement*. It shows no signs of the hasty preparation that was forced upon him. It is to be hoped that it will assist the Commission in its responsibilities and will indicate to it that its deliberations are of more than just parochial importance.

We record with deep regret the death on August 23 of Professor René Sand, emeritus professor of social medicine in the University of Brussels. He was taken ill about ten days before the First World Conference on Medical Education began. The introductory remarks to the Section of Preventive and Social Medicine which Professor Sand was to have given on August 25 as one of the Vice-Presidents of the Conference are published elsewhere in this issue. Professor Sand's place as Vice-President was taken by Professor A. Stampar, of Zagreb.

¹ *British Medical Journal*, 1953, 1, 213.

² *Ibid.*, 1952, 1, 917.

³ *Ibid.*, 1953, 2, 140.

⁴ *Ibid.*, 1953, 1, 577.

¹ Linklater, E., *The Man On My Back*. London: 1941. P. 175.

² Wright, S., *Applied Physiology*, 9th ed. Oxford: 1952. P. 818, 467.

³ Mavor, O. H., *British Medical Journal Supplement*, 1939, 1, 245.

FIRST WORLD CONFERENCE ON MEDICAL EDUCATION

OPENING CEREMONIES AND INAUGURAL SESSION

The First World Conference on Medical Education was opened at Friends House, London, on Monday, August 24, and continued for the ensuing five days. It was held under the auspices of the World Medical Association, in collaboration with the World Health Organization, the Council for International Organizations of the Medical Sciences, and the International Association of Universities. The international character of the event was illustrated by the programme of papers, whose authors came from 32 countries. The British Medical Association was the host organization. The general theme of the Conference was undergraduate medical education, and the subjects of the sectional discussions were: requirements for entry into medical schools; aims and content of the curriculum; techniques and methods of medical education; preventive and social medicine. The keynote addresses by the Vice-Presidents at each of the Section meetings are published elsewhere in this issue.

The President of the Conference was Sir Lionel Whitby, the Deputy President Professor W. Melville Arnott, and the Chairman of the Organizing Committee Dr. T. C. Routley, of Canada.

Sir LIONEL WHITBY, in opening the Conference, said that he was deeply conscious of the honour of presiding over so important an assembly. He expressed his great appreciation of the support given to the Conference by H.M. Government and by certain international organizations whose representatives would presently address them. More than 400 delegates from many countries were in attendance, and it was a great pleasure to the British Medical Association to be the host.

"We are out to try to discover how best to teach the young men and women who are going to be the doctors of the future. During this week teachers of medicine and educationists from all parts of the world will put forward their views not only on medical but on general education; they will discuss techniques of teaching as well as the extremely important social implications of medicine at the present day.

"Each session will have its rapporteur as well as its reporter, so that not only will the Conference be accurately reported but the value of each series of contributions made will be assessed."

Welcome by Ministry of Health

Miss P. HORNSBY-SMITH, M.P., Parliamentary Secretary to the Ministry of Health, conveyed a welcome on behalf of the Minister.

"The interest of the Ministry of Health in this Conference is paramount, since we are responsible in this country for the National Health Service, the quality and efficiency of which in its major sphere must depend in the last resort on the humanity, integrity, knowledge, and skill of the doctors working in it.

"I am glad to record that the National Health Service does to some extent repay the debt it owes to the universities and medical educationists by providing those clinical facilities which are an essential part of our training in this country and which are so necessary if students are to be taught in the British tradition. To this end the Ministry, through the Health Service, maintains the great teaching hospitals in London and the provinces. Many educational opportunities are also provided in non-teaching hospitals, which in great measure accept responsibility for newly qualified doctors in their pre-registration year. . . .

"Great and far-reaching changes have taken place in the art and science of medicine in our lifetime, many indeed within the last two decades. Many of the old methods by which students have been taught in the past are now out-of-date. In this country we have always specialized in practical bedside teaching, while others have laid greater stress on the academic approach. Yet both are now in difficulties with the accumulating mass of scientific fact and the multiplication of specialist technique. Many vital problems face you to-day, problems which cannot be shirked and which will in the ensuing days provide worthy exercise for the great minds here assembled."

Sir ANDREW DAVIDSON, Chief Medical Officer of the Department of Health for Scotland, after apologizing for the absence of the Secretary of State and conveying his good

wishes, said that a glance at the names on the conference programme, with the eminent medical teachers from so many countries, suggested that the success of the conference was already assured. They in Scotland were justly proud of their four university medical schools and their position in medical teaching and the high standard of their products. It had often been said that medical education was a Scottish national industry with a large and prosperous export trade. Between the two wars about one-third of all doctors who graduated in the United Kingdom received their education in Scotland, even though that country had only one-ninth of the total population.

"The World Medical Association and the World Health Organization, together with the B.M.A., are to be congratulated on their efforts to focus attention on what, after all, is the fundamental problem of health services everywhere. Their combined operation is timely; with the advance of medical science, the scope of medical education continues to widen. New subjects take shape and are added to an ever-expanding curriculum. The time has surely come to define more clearly the objectives of medical education and to adjust the curriculum to the attaining of those objectives. It may appear simple to add new subjects to the medical course, but may it not create recruitment difficulties if the already lengthy and arduous course becomes longer and more strenuous?"

At the present time the universities were changing over from a five-year to a six-year course, and after allowing for the pre-registration period and the two years of military service the young doctor had a very long time of training before he settled down to his career. Already there were signs of reduction in the number of applicants for admission to medical schools, though several years would be necessary to show whether the reduction was a temporary phenomenon or a significant trend.

Miss FLORENCE HORSBRUGH, M.P., Minister of Education, who could not be present, sent a message of good wishes.

Professor CHARLES HARRIS, as representing the University of London, joined in the welcome. He said that in London, in addition to the postgraduate institutes, there were 12 undergraduate schools, which gave them the opportunity of trying out a variety of methods in medical education. In London, for example, the study of pathology was carried out in the clinical years, whereas in Cambridge, from which university they drew many of their clinical students, the students had already spent a considerable period learning pathology and bacteriology. He said how grateful they were in London to those who had organized the conference and how anxious they were to profit by the results of their deliberations.

Welcome by British Medical Association

Dr. E. A. GREGG, Chairman of Council of the B.M.A., said how glad he was to associate his organization with these welcoming addresses. They of the B.M.A. had a very lively interest in the conference, not only because of the nature of the subjects discussed, but also because the germ of the conference was planted by Dr. Clegg, the Editor of the *British Medical Journal*, who first suggested to the World Medical Association that the subject was one which might well receive their attention. The result was that they found themselves that day embarking on this important and most useful conference. It was also a matter of gratification to find their Past-President, Sir Lionel Whitby, in the chair. The B.M.A. were not strangers to the subject of this conference. They had already done a great deal of work in this field, particularly through the committees presided over by Sir Henry Cohen.

Dr. DAG KNUTSON, Chairman of the Council of the World Medical Association, in joining in the welcome, said that this was a conference and not a congress. A conference was a meeting where those assembled tried to clarify their views

rather than to arrive at definite solutions. They were well aware that definite solutions of the problems of medical education could not be reached, but he hoped that at the end of the conference they would go away with a better understanding of each other's problems. The World Medical Association had not been alone in preparing for this conference, and he expressed gratitude to the two other international bodies already named which had collaborated, and also to the British Medical Association for its preparatory work.

Dr. M. G. CANDAU, Director-General of the World Health Organization, said that it was with special pleasure that his Organization came to this conference. There was no need to emphasize the importance of the problems to be discussed during the next few days. The physician must be aware of all the sciences which had their impact on medicine, but he must also be steeped in the cultures of his country and his time. In education more than in any other human endeavour it was vital to be responsive to new ideas. One of the most important ways was by making the experience gained in one country known to educationists in other lands.

Professor J. MAISIN, President of the Council for International Organizations of the Medical Sciences, also joined briefly in the welcome and said that he hoped the conference would form the corner-stone of a new edifice of medical education.

Professor S. C. ROBERTS, Vice-President of the International Association of Universities, said that his association was still in its first youth, but, as its name implied, it had a vital and genuine interest in all branches of education at university level, and among those branches one of the most important was, of course, that of medical education. He joined in offering his congratulations to those who had organized the conference.

Presidential Address

Sir LIONEL WHITBY then delivered his Presidential Address, which was entitled "The Challenge to Medical Education in the Second Half of the Twentieth Century." The address is published in full in the opening pages of this issue.

Dr. L. GARCIA TORNEL (Barcelona), in responding, said that the name of the President of the conference, Sir Lionel Whitby, was well known far beyond his own country. The university with which he was associated was also held in high honour. The name of Cambridge was a symbol of the triumph of the true university spirit. He could not enter in detail into the President's Address, but he wished to underline what Sir Lionel had said about the need for vocation in medicine and also in teaching. The task of the teacher was one of the most difficult in the world. It entailed sacrifice and responsibility. It was for the teacher to inspire and influence youth. If a career in medicine were undertaken without any true vocation it would be disastrous. In conclusion he paid a warm tribute to the British medical profession.

What is Education?

The first of three addresses given during the Monday afternoon session, all of them published elsewhere in this issue, was by Sir RICHARD LIVINGSTONE, formerly President of Corpus Christi College, Oxford, who took as his title "What is Education?" (p. 454).

The response was made by Dr. M. POUMAILLOUX, counsellor of the Federation of French Medical Syndicates. He said that Sir Richard Livingstone had expressed certain ideas which were dear to himself. Much had been said about the reform of medical studies with which they were concerned to-day. There was one point on which they had been able to achieve virtual unanimity—namely, the necessity of pursuing classical studies. Perhaps these studies were more necessary to-day than formerly, when the "superstition" of technical studies distorted the situation more than was often realized.

The problems they had to meet were more and more difficult. Such was the growing complexity of the profes-

sion that it was virtually impossible to give a young man a sufficient education in all the branches of medicine. Speaking as a teacher, he felt that students were not interested in the details of the curriculum but in the major aims which governed the study.

What were the aims of young people? Why had they chosen the medical profession? Were they disappointed on their first contact with medicine or their patients? The choice of career was made very often as a result of the trust and confidence a student had in his teacher. Young people to-day had hearts as warm and enthusiasms as fervent as in earlier generations, but materially and economically they or their parents were encountering greater difficulty.

The aim of medical studies must be to enable the doctor to treat his patients. To this end the fundamental studies must be pathology and therapy. Medicine must be learnt at the bedside of the patient. It could not be wholly learnt at hospital. What did they learn at hospital of the living conditions of their patients? All those upon whom fell the call and the responsibility of caring for patients should be people whose heart and soul were as highly developed as their intelligence. Therefore those young people whose heart and soul would never be equal to their task should be eliminated from the medical schools.

Finally, while an effort should be made to harmonize curricula, any overall uniform method must be avoided. Each country had its different characteristics and needs. "We should not try in any way to create physicians who will be the same everywhere, for such would be considered excellent in some countries and deplored in others."

The History of Medical Education

The second address was by Professor JOHN F. FULTON, Sterling Professor of the History of Medicine at Yale, whose subject was "The History of Medical Education" (p. 457). The response was by Professor A. SPINELLI, senior surgeon, United Hospitals, University of Rome, who spoke appreciatively of Professor Fulton's account of Salerno—a school which inspired scholars for centuries after its foundation—and the schools of Paris and Montpellier, of Bologna, Ferrara, and Pisa, the various schools in Germany, Switzerland, and Denmark, and Oxford and Cambridge in England. Oxford and Cambridge had brought English culture to a very high level, and he spoke of the pleasure with which members of the Conference had visited Cambridge on the previous day.

Medicine—Technology or Profession

Colonel S. M. K. MALLICK, Principal of the Dow Medical College and Civil Hospital, Karachi, gave the final address, on "Medicine—a Technology or a Profession" (p. 461).

Dr. T. C. ROUTLEY, general secretary of the Canadian Medical Association, made the response. He stated that he had recently sent a questionnaire to 200 Canadian doctors on whether medicine was a technology or a profession, and of the 153 who had replied 151 had insisted that it was a profession, while two stated that as practised to-day it was more and more degrading itself into a technology. He quoted some of the comments received in reply to the questionnaire: "Technology completely lacks the comprehension of the doctor-patient relationship." "Medicine is not an exact science, therefore it can never be described as a technology." "If we do not insist on science being a secondary and ancillary service to the art of medicine we shall let a great profession down." "A patient requires more than technology—kindness, sympathy, understanding, human interest."

A great responsibility, said Dr. Routley in conclusion, rested upon the profession of medicine to maintain the professional position which the practitioners of medicine must for ever occupy.

On the second day, August 25, the Conference met in four Sections. The proceedings of the first day of the sectional meetings are reported in the following pages.

PROCEEDINGS OF THE SECTIONS

SECTION A: REQUIREMENTS FOR ENTRY INTO MEDICAL SCHOOLS

After the keynote address from the chair by the Vice-President, Dr. VICTOR JOHNSON (United States), this section discussed the requirements for entry into medical schools.

General Education in an Age of Science

Mr. T. E. B. HOWARTH (Winchester College), opening the discussion, said that we in this country were committed to a system involving a high degree of early specialization and the educational segregation of the more intelligent children. It came as a shock to some other countries that an English schoolboy started on intensive preparation for the medical profession as early as 15 or 16. Not more than a quarter of his school studies would be devoted to subjects other than biology, physics, chemistry, and mathematics.

The general education of the scientist should include as much guidance on the human situation as was possible and a realization of the fact that man was a religious being. Right in the forefront of the young scientist's general education should be placed a study of man's striving towards God. The young scientist might not believe in the religious or philosophical system he was studying, but he would at any rate learn why many other people did so.

Dr. CHAUNCEY D. LEAKE (University of Texas) discussed the general education of the medical student. The future doctor should know some mathematics and physics. As for chemistry, he should understand the principles of quantitative and organic analysis and synthesis, and physical chemistry. To this hard core it would be wise to add some training in psychology. The future doctor should know something of the history of science and have an appreciation of the principles of economics. Finally, some exercise in the various fine arts greatly assisted in maturing taste and judgment.

Dr. T. B. DAVIE (University of Capetown) said that students would not attend courses of lectures designed to improve their cultural background.

Dr. HOWARD BERK (U.S.A.), Dr. ST. GEORGE B. DELISLE GRAY (United Kingdom), Dr. P. GLORIEUX (Belgium), Professor J. G. ORCOYEN (University of Madrid), and Professor FELIX HURTADO (Cuba) also spoke.

The Doctor a Humanist

Professor A. SANDOZ (France) urged that it should be remembered that the work of the future doctor would not be limited to the study of physiological functions and biological reactions, but would bear on the whole man, mental and spiritual as well as physical. A doctor was necessarily a humanist; if this were not so he would be no more than a veterinarian.

Dr. ALAN VALENTINE (U.S.A.) declared that unless scientists, and especially medical scientists, proclaimed the value of human culture and human self-realization, there might come to be no real general education in this age of science.

Dr. MOGENS PIHL (Denmark) spoke of the teaching in secondary schools. In his country they believed that too much specialization before the university was a bad thing. The secondary schools in Denmark had a modern, a classical, and a science side, all of them qualifying for the study of medicine. It was an advantage if the medical student had attended the science side, but such pre-training was not necessary.

Mr. J. L. STRUTHERS, a medical student from St. Bartholomew's Hospital, hoped that students would be given instruction in writing and speaking their own language.

Mr. S. A. BARNETT (University of Glasgow), Dr. THOMAS STAPLETON (St. Mary's Hospital Medical School), Professor D. E. CAMERON (McGill University), and Dr. G. MOUTHON (France) also took part in the discussion.

Methods of Selection in United States

Dr. DONALD G. ANDERSON (American Medical Association) described the system for selecting students for admission to medical schools in the United States. The basic structure of education consisted of eight years of elementary school, four years of high school, and four years of college. At the end of this period the successful student was awarded the B.A. or B.Sc. degree. In medicine, three years of college work was the minimum preparation on which a student might enter the medical school. The length of the medical school course was four years. The total number of students in the United States applying for admission to medical schools in any one year was now slightly more than twice the total number of places available.

Dr. M. PRYVES (Hebrew University, Jerusalem) said that a new arrangement at the Hebrew University was the establishment of a special class of one to two years' duration in the framework of the university to which candidates in medicine, dentistry, pharmacy, and biology would be freely admitted. The curriculum would be composed of subjects in the sciences and the humanities in a balanced form.

Mr. D. H. PATEY (Middlesex Hospital) said that the highest form of selection for any medical student was to be a woman and to get into Oxford or Cambridge. These women were intellectually the cream of the country from the point of view of selection. His impression was, however, that they were a good average, not, as he would have expected, outstanding. Here was an opportunity to test a fine sieve of selection against the end-result.

Dr. J. C. VILLAGRANA (Mexico), Dr. P. GLORIEUX (Belgium), Dr. FELIX HURTADO (Cuba), and Dr. S. C. SEN (India) also took part in the discussion.

Competition for Entry

Professor A. P. THOMSON (Birmingham University) maintained strongly that medicine was in itself a humane study. He said that a selection committee should vary in personnel—if one had a fixed committee one got a fixed type of student. He felt that a knowledge of mathematics, and at an advanced level, was necessary for the medical student. To-day any student who succeeded in obtaining a place in a university on the ground of his talents might usually rely on a grant from public funds to meet a substantial part of the cost of his fees and maintenance. As a result, in his own faculty during the last seven years they had never received fewer than 2,000 applications a year for about 100 places.

Professor Thomson said that in present conditions it was difficult to find a place in university medical schools for candidates who had acquired distinction in other directions before they were attracted to medicine. It was perilously near heresy for him as a member of the General Medical Council to suggest that first-class honours graduates in mathematics or philosophy might be admitted as medical students on special terms. Nevertheless, in his own judgment, the regulations were too rigid.

Professor A. SPINELLI (Italy) said that in Italy they considered children studied too much Latin and Greek and too little chemistry and physics. They believed that selection should take place in the secondary schools on the results of teachers' and school doctors' reports and tests.

Dr. MYRON E. WEGMAN (Director, Division of Education and Training, Pan-American Sanitary Bureau) said that the requirements had to be judged in terms of the primary education in a country.

Professor ORCOYEN (Madrid) reported that a selective course for those seeking to study medicine, pharmacy, etc., had reduced the number of candidates for medicine by 50%, and increased the numbers of those who entered the Faculty of Law.

The discussion was continued by Dr. M. POUMAILLOUX (France), Dr. T. B. DAVIE (South Africa), Professor HANS NEUFFER (Germany), and Dr. L. G. TORNEL (Spain).

SECTION B: AIMS AND CONTENT OF THE MEDICAL CURRICULUM

After the keynote address from the chair by the Vice-President, Sir A. L. MUDALIAR, this section discussed the aims and content of the curriculum.

The Teaching of Anatomy

Sir CECIL WAKELEY (President of the Royal College of Surgeons) said that the only way of learning human anatomy was by careful dissection of the whole body, but this could rarely be attained because of the shortage of subjects for dissection and the large number of students in the schools. The ordinary practising doctor did not require to have a detailed knowledge of the human body, but it was absolutely essential that the surgeon to-day, more than ever before, should have an intimate knowledge of anatomy. It was for the Government to see that an adequate number of cadavers were forthcoming. Those who specialized in surgery must take a course in basic medical sciences before they sat for the Primary Fellowship of any of the Royal Colleges. During this science course the student should dissect or take part in dissecting the whole of the body.

Professor NILO PESONEN (Finland) thought that even the best demonstration preparations could not replace the benefit derived from the dissection of specimens by the student himself.

Dr. J. V. BASMAJIAN (Canada), Professor M. TALAAT (Egypt), Professor W. GREULICH (U.S.A.), and Dr. J. W. PATTERSON (U.S.A.) took part in the discussion.

The Teaching of Physiology

Professor W. J. E. JESSOP (Royal College of Surgeons in Ireland) said that the problem of designing a general course in physiology could only be solved by close co-operation between the professor of physiology and those responsible for shaping the courses in the related special subjects. A good general course in physiology must stress principles rather than details, encourage reasoning and criticism rather than memorizing facts, and arouse the student's interest.

Professor HAROLD SCARBOROUGH (University of Wales) said that medicine was a scientific discipline and medical education should be an exercise in the application of the scientific method. That had to be emphasized at a time when it was beginning to be suggested that more of students' time should be devoted to training in the social sciences and even occupied at an early stage with visits to patients' homes.

Professor M. TALAAT (Egypt) and Professor J. N. P. DAVIES (Uganda) also spoke.

Integration of Physiology and Anatomy

Professor S. ZUCKERMAN and Professor H. P. GILDING (University of Birmingham) gave a paper on the integration of physiology and anatomy as a single subject in the medical curriculum. In arranging this integration at Birmingham, they had, wherever possible, eliminated courses of lectures which were either purely anatomical or purely physiological. The time devoted to the dissection of the body had been reduced to three terms instead of the original five. Under the Birmingham system the second M.B. examination was divided into two parts, the first of which was taken at the end of the first three terms and comprised macroscopic and microscopic anatomy. The second part of the examination was taken at the end of the fifth term and was mainly concerned with physiological and biochemical matters.

Dr. P. HAGEN (Australia) said that he did not think there were any preclinical teachers not prepared to agree that some measure of integration of the two subjects was desirable.

Professor LUANG B. BIDYABHED (Thailand) and Professor W. J. E. JESSOP (Ireland) spoke in agreement.

Pathology: The Basic Clinical Science

Professor J. H. BIGGART (Queen's University of Belfast) said that many schools were convinced of the value of an introductory course in clinical medicine and surgery when

the student first entered hospital. During this period, which, he thought, should be of six months' duration, the student should have courses in bacteriology and general pathology. Then should come a course in special pathology. The student should witness the examination of the patient and the study of his disease by a number of specialists, each of whom brought to the problem his own particular methods and knowledge. Three terms of such a combined integrated course should suffice to cover special pathology, medicine, surgery, and therapeutics, a great deal of paediatrics, and social medicine.

Professor H. SIEGMUND (W. Germany) said that pathology should be taught in such a way that it gave a scientific background to the practice of medicine. Dr. H. G. WEISKOTTEN (U.S.A.) and Dr. ROBERT A. MOORE (U.S.A.) both stressed the importance of students carrying out experimental work, and Dr. D. N. BARON (Middlesex Hospital) also spoke during the discussion.

Pharmacology and the new Therapeutics

Professor E. J. WAYNE (Sheffield University) described the course in pharmacology and therapeutics as it had gradually evolved at Sheffield. Immediately after the second M.B. examination in physiology and anatomy, a short introductory course of 10 lectures in pharmacology was given so that the student might understand the relationship of the subject to his previous studies and know something about the drugs which he is beginning to see in use in the wards. This was followed by lectures in pharmacology during five terms. After a year's interlude, he attended a course in therapeutics in which the subject was considered from a practical point of view. A special feature was the criticism of advertisements in the current medical journals, which students undertook themselves in front of their colleagues. The prescriptions in the *National Formulary* were also rigorously criticized and students were asked to suggest improvements.

Dr. SUPHI ARTUNKAL (Turkey) told how pharmacology and therapeutics were taught in Istanbul. The two departments were in the hands of the same professor and the subjects were taught for approximately 70 hours each, during the same period. The courses took place in the theatre of the therapeutic clinic, which had a capacity of 75 beds and an out-patient department.

Professor CHAUNCEY D. LEAKE (U.S.A.) said that the subject of pharmacology had become one of vast confusion because of the enormous flood of new drugs. It might help if drugs were classified on the basis of their four primary uses—for diagnosis, prevention of disease, cure, and the alleviation of disease.

Medical Statistics

Professor A. BRADFORD HILL (London School of Hygiene and Tropical Medicine) said that the only teaching of statistical methods necessary in the medical curriculum for the embryo doctor was a short elementary course requiring no mathematical ability and designed to familiarize students with statistical ideas and the most commonly used elementary methods. He desired to see the undergraduate taught to weigh figures critically, and not to accept them without thought at their face value, how to look carefully for possible bias in a given set of data, and how far in any instance it was reasonable to pass from the particular to the general. This syllabus could be put into not more than 10 lectures accompanied by some practical work.

SECTION C: TECHNIQUES AND METHODS OF MEDICAL EDUCATION

After the keynote address from the chair by the Vice-President, Professor A. HURTADO (Peru), this section discussed the techniques and methods of medical education.

Hospital Bedside Teaching

Professor L. A. HULST (University of Amsterdam) said that the very fact that there were diseases and patients

whom it was better to treat elsewhere than in hospital showed that the medical pattern in a hospital differed from that which the student would find in general practice. The intending general practitioner was trained mainly in diseases which he would not treat and might rarely see. Hospital teaching was not only one-sided in this respect but also it confronted the student with entirely different patients. Professor Hulst further insisted that the hospital bedside teaching of medicine should be concerned with only those patients who were properly in a hospital bed and not with patients who required rest in bed in order to recover.

Dr. STANLEY DORST (University of Cincinnati) believed that the teaching hospital must have a cross-section of clinical medicine. The chief of the department of medicine should be in charge, with clinical teachers available in the proportion of one to seven or eight patients. These requirements were fulfilled in most American schools. He insisted on the importance of ward rounds, followed by a seminar led by the physician but with the whole group participating.

Dr. M. POUMAILLOUX (France) thought that the undergraduate should not wait unduly long before examining the patient at the bedside. If he kept to the technical side of medicine for too long he would see his patient only as an interesting case. Dr. VICTOR SORIANO (Uruguay), Dr. HANS NEUFFER (President, West German Medical Association), Professor A. J. CRAIG (Malta), Dr. E. HUSFELDT (Denmark), Dr. DAG KNUTSON (Sweden), and Professor M. MULLER (Lille) also spoke.

Teaching in the Operating Theatre

Professor Sir GEOFFREY JEFFERSON (Manchester University), in an address on the importance of bedside learning, discussed teaching in the operating theatre. Attendance of the student dressers *en masse* at operating sessions was stupid, but the student whose case it was should be present. He must learn at close quarters. The surgeon could refresh the student's anatomy and demonstrate the pathology of the condition. Few teachers did this very well.

Sir Geoffrey Jefferson added: "It was only when I began to operate myself that I knew what it was that I wanted to know."

Mr. H. D. MOORE (Leeds) said that he had noticed that as a specialty became divided from general surgery the scope of cases became more and more limited and the student lost a great deal. This applied particularly to thoracic surgery. Dr. HANS NEUFFER (West Germany) said that every student should undertake three months' nursing. Dr. P. VALDONI (Italy) sent a written communication.

The Out-patient Department

Dr. DAG KNUTSON (Karolinska Hospital, Sweden) spoke of the use of the out-patient department or polyclinic for educational purposes. The cases at a polyclinic were different from those in the wards—generally of a less serious nature. Patients came demanding a quick answer, and decisions had to be made swiftly. Polyclinics, therefore, gave the student new and useful experiences.

Professor HERMANN CHIARI (University of Vienna) said that in the polyclinic the diagnosis should be made in as uncomplicated a manner as possible. Mr. M. R. EWING (London) said that many of the inadequacies of surgical treatment were made manifest when patients were followed up in the out-patient clinic. Dr. VICTOR SORIANO (Uruguay) and Professor G. A. RANSOME (Malaya) also contributed to the discussion.

Teaching in the Home

Professor KINLOCH NELSON (Richmond, Virginia, U.S.A.) described how the Medical College of Virginia joined up with the city health department to provide medical care for the indigent through a continuity of service between home, clinic, and hospital.

Dr. JOHN HUNT (honorary secretary, College of General Practitioners) said that an important addition to medical

education during the next twenty years would be an introduction of all medical students to family doctoring by general practitioners. It was the exception for the undergraduate to see a general practitioner at work.

Dr. F. M. ROSE (Preston) said that teaching of medical students in the home would help not only the future general practitioner but also the budding specialists.

Dr. G. O. BARBER (United Kingdom) said that he hoped some young students on contact with general practice would feel discontented and would aspire to a higher standard.

Dr. J. A. PRIDHAM (chairman of the Medical Education Committee of the W.M.A.) considered that, just as students were trained in dermatology, internal medicine, and the like, so they should be taught that general practice could fully engage their mind and heart.

Dr. ST. GEORGE B. DELISLE GRAY (United Kingdom) said that many young specialists to-day knew nothing about general practice. Dr. E. M. DIMOCK (University College Hospital) said that many people found general practice difficult because it introduced tasks of which they had little experience, and they were dispirited. Dr. A. TALBOT ROGERS (United Kingdom) described the working of the trainee-assistant scheme in this country. The scheme was working well. Professor IAN AIRD (Postgraduate Medical School) said that many specialists he knew were great men and yet had had no experience of general practice. If they had been tempted into that field the world might have been deprived of their special gifts.

The Clinico-pathological Conference

Dr. BENJAMIN CASTLEMAN (Massachusetts General Hospital) described the clinico-pathological conference—a teaching exercise utilizing the specific case history of a patient, the nature of whose disease has been established either by surgery or necropsy. A selected person or the whole group analyses the case and a diagnosis is made on the basis of the analysis. The weekly conferences at the Massachusetts General Hospital for the staff and senior students are conducted by the pathologists, with occasional suggestions from the clinical staff. The pathology resident officer who examined the specimen or did the necropsy prepares the clinical abstract, and the "discusser," who analyses the case and explains and interprets the meaning of the signs, symptoms, and findings, is one who has no knowledge of the patient. The conferences bring out clinical details and clinico-pathological correlations not found in textbooks.

The discussion was continued by Professor G. A. ELLIOTT (University of Witwatersrand), Professor A. GARRETTON-SILVA (Chile), Professor VICTOR SORIANO (Uruguay), and Professor A. HURTADO (Peru).

The Laboratory in Teaching

Dr. J. W. PATTERSON (Western Reserve University, Cleveland) described a new teaching programme at his medical school. The first year of the programme dealt with normal structure, function, growth, and behaviour, and the patient-physician relationship. The next two years was concerned with deviations from the normal and with the introduction of the student to disease. The third phase was a review of the basic material at the bedside and the care of patients. During the second six months of the first year on one day each week the students, working individually or in small groups, were expected to complete a simple problem, survey the literature related to it, organize an experimental test, evaluate the findings, and present the results to their colleagues.

Professor L. P. GARROD (St. Bartholomew's Hospital) said it should not be forgotten that no amount of planning or integration could take the place of the acquisition of factual knowledge. In pathology and bacteriology students should be given every opportunity to do as much practical work as possible.

Dr. F. JEAN VINTER, secretary of the Universities Federation for Animal Welfare, and Dr. HARRY LILLIE, of Dundee, also spoke.

SECTION D: PREVENTIVE AND SOCIAL MEDICINE

Before the section began discussing the teaching of preventive and social medicine, Professor A. STAMPAR (Zagreb), a Vice-President of the Conference, spoke from the chair. After describing developments which had led to international collaboration in the field of medical education, he said that preventive and social medicine still did not find a proper place in the curriculum of many medical schools, but they had an opportunity to discuss it at the Conference, and to try to find a solution to the problems involved.

The news of the death of Professor René Sand was received with much sorrow during the morning session. The chairman paid a tribute to Professor Sand, and the company stood for a minute in silence.

Present Status

Professor-emeritus H. PÉQUIGNOT (Paris) gave an account of the instruction given in French faculties of medicine in hygiene and in preventive and social medicine. He said that traces of such instruction in the faculties of medicine were to be found even in the period before the Revolution, and during the nineteenth century chairs of hygiene were established. In a number of the faculties there existed side by side with the chair of hygiene special chairs in industrial health, sometimes associated with forensic medicine. Preventive and social medicine did not now constitute a separate specialty; it was rather a new dimension of all medicine and of all medical work.

Professor WILSON G. SMILLIE (Cornell University) said that all great physicians had fully recognized that medicine was a social science and an essential community service. Preventive medicine must be taught, as curative medicine was taught, at the bedside, in the clinic, and in the home. At Cornell University each student was assigned to one family which he followed throughout a year, and it was his duty to study their way of life; he had an adviser with whom he discussed all special matters.

Professor A. LESLIE BANKS (University of Cambridge) said that as long ago as 1868 the Board of Medical Studies at Cambridge recommended to the Vice-Chancellor that one of the four topics to be submitted to the candidate for his M.D. thesis should be State medicine. Since that period, and indeed within our own lifetime, the outlook had changed completely. The State had swung from an attitude of *laissez-faire* to an intense interest in the personal health and welfare of the individual. The research worker, clinician, and specialist in preventive medicine had so extended their spheres that they now overlapped. In spite of differences between the various schools, the teaching of public health in Great Britain had now been replaced by the wider concept of social and preventive medicine.

Professor J. H. TUNTLE (University of Groningen) thought that it was inevitable that a great deal of curative practice would go permanently to specialists, but ample compensation for this loss might be found in the field of social medicine and in that of scientific investigation. The integration of social medicine with the undergraduate teaching of clinical and laboratory medicine was a *sine qua non* if the family doctor was to be preserved from extinction.

Professor EDWARD GRZEGORZEWSKI (W.H.O.) thought that, looking at medical education from an international observation point, it was obvious that the trend towards preventive and social aspects of medicine was almost universal. In face of inherent conservatism, medical schools were slowly accepting the idea, and this must be followed by practical measures.

The Teaching of Preventive Medicine

Professor G. A. CANAPERIA (High Commission for Hygiene and Public Health, Rome) gave a brief description of the teaching of preventive and social medicine in Italy. Hygiene was taught to Italian medical students during the fifth of their six years of study, but by this stage the mentality of the student had already turned to therapeutic medicine, and

when finally faced with the discipline of social medicine he was already too much accustomed to the consideration of individuals only from the clinical point of view.

Professor G. E. HOBBS (University of Western Ontario) said that the level of health development in Canada was so high that the content of teaching in prevention must be different from what it was in areas which had not reached this level. The schools in the Dominion presented the wide variety of conceptions which were to be found in any area where traditionally health control had passed to a stage of maintenance, and where the classical preventable diseases were no longer major health problems.

Dr. G. O. BARBER (United Kingdom), Dr. J. L. TROUPIN (W.H.O.), Professor ALAN M. CRITCHLEY (Iraq), Professor FELIX HURTADO (Cuba), Dr. E. M. DIMOCK (United Kingdom), and Professor THOMAS FRANCIS (Michigan) took part in the discussion.

Social Medicine as an Academic Discipline

Professor T. MCKEOWN (University of Birmingham) first discussed the advantages which the use of experimental animals offered to the research worker. These included the use of pure stock—which made it possible to establish certain laws of inheritance—the control of environment, and the use of large numbers. The only serious disadvantage was uncertainty about the applicability of results obtained in the laboratory to man. He went on to say that there was a large class of problems appropriate to biological inquiry in which it seemed inconceivable that advance could be made by mere statistical methods unless the people using them were primarily biologists who turned to the collection of human data as an alternative to laboratory investigation. The task of assembling good data on man was one to which the department of preventive and social medicine should direct its attention.

Professor A. STAMPAR (Yugoslavia) gave his definition of social medicine as a "science dealing on the one hand with mutual relations between social and economic conditions in the health of individuals and groups and on the other hand with measures of medical and social care for preventing disease and promoting health." The teacher of social medicine should be on equal footing with the holders of other chairs in the medical faculties.

Social Medicine in the Curriculum

Professor F. A. E. CREW (University of Edinburgh) said that the role of social medicine in the curriculum was to enable the student to acquaint himself with: (1) the human family, its biological significance and social function; (2) the social function of medicine; (3) the existing machinery of medicine in a selected country; (4) the diseases of major social importance in the selected country; and (5) the inter-relationship of medicine and statecraft in the field of human ecology.

Dr. G. W. GALE (South Africa) drew a comparison between social aspects of medicine in the so-called underdeveloped countries and in the more highly organized communities. He then went on to describe the recently established medical school at Durban, where primarily Africans and other non-Europeans received training. It was proposed to make use of several health centres in the teaching of social medicine.

Dr. W. P. DEARING (U.S.A.) said that no system of medical science and thought in the world to-day could claim the capacity to solve all health problems; some diseases of world-wide prevalence, such as malaria and enteric infections, could not be dealt with effectively without the application of engineering and sanitary science. Others, such as the nutritional deficiency diseases, could not be dealt with effectively without attention to economic and social conditions.

Dr. ROBERT SUTHERLAND (Leeds University) said that before a medical student went on to study clinical medicine he should study preventive medicine. Throughout his study detail should be subordinate to an understanding of the whole man.

THE ENROLMENT IN MEDICINE

Increase in Registrations

The total number of names in the current *Medical Register* is 83,914, an increase of 1,658 over the corresponding figure on January 1, 1952. The number is higher by 6,343 than the average for the last 10 years, and higher by 15,248 than the average for the last 20 years. In 1933 the total number on the *Register* was 56,741. The number added by registration in 1952 (4,493) was the highest on record, having been greatly increased by Commonwealth registrations, which numbered 1,452, three times as many as the year before. As against this there were in 1952 an unusually large number of removals under section 14 of the Act of 1858—the section which prescribes that names shall be removed after a stipulated period in the absence of any answer to the inquiry whether there has been cessation of practice or change of address. The number removed under the penal sections of the Act is no greater than it was 20 years ago, though in the meantime the total on the *Register* has increased by 40%.

Of the persons whose names were added to the *Register* in 1952 1,848 of their registrations were in England, 673 in Scotland, and 506 in Ireland. The following Table gives the position of the *Register* at the end of each of the last 10 years:

Year	Registration	Added by Restoration	Death or Removal	Total
1943	3,532	13	1,091	71,882
1944	2,971	11	1,218	73,646
1945	2,666	11	1,190	75,133
1946	2,237	14	1,092	76,292
1947	2,787	10	1,160	77,929
1948	3,968	16	5,621	76,292
1949	3,109	19	1,280	78,140
1950	3,160	45	1,123	80,222
1951	3,075	29	1,070	82,256
1952	4,493	46	2,881	83,914

The unusual removal figures for 1948 were due to removals from the temporary list following the passage of the Medical Practitioners and Pharmacists Act of the previous year and the transference of many of the names to the permanent list.

The Student Entry

The total number of students beginning the medical curriculum proper during the year 1952-3 is estimated—the returns from some of the schools are not complete—at 2,512, which is about 50 fewer than the previous year. The annual entry during the last seven years has been between 2,500 and 2,700. During the early years of this century, up to the time of the first world war, the annual entry of students was about 1,400.

The training of medical students is shared between the teaching hospitals and the universities. In London the 12 undergraduate teaching hospitals, and in England and Wales, apart from London, the 10 teaching-hospital centres in association with the universities, have been designated as teaching centres. In Scotland hospitals are not designated as teaching hospitals; all of them come under the jurisdiction of the five regional hospital boards, but provision is made for inclusion on the boards of management of nominees of the university on which the region is centred. In Northern Ireland the duty is laid upon the hospitals authority—a body corporate—to provide the Queen's University, Belfast, with adequate facilities for medical teaching.

Provisional Registration

Under the Medical Act, 1950, full registration is not granted without proof of experience—namely, a certificate that the applicant has been engaged in employment in a resident medical capacity in one or more approved hospitals or institutions (including an approved health centre) for the period prescribed by the regulations of the General Medical Council. January 1, 1953, was appointed as the day after which a newly qualified person would not be eligible for full registration unless and until he had, after passing his qualifying examination, served as house-officer in one or more such approved hospitals or institutions for 12 months.

The proposed form of certificate to be given by hospital authorities for submission to the licensing bodies when a provisionally registered practitioner has satisfactorily completed a period of employment as house-officer has been circulated to licensing bodies, examining boards, and medical schools for their observations, and is as follows:

It is hereby certified that.....of.....has been employed as shown below in a resident medical capacity (as defined in section 2 of the Medical Act, 1950) in the under-mentioned approved hospital or institution for the period specified, and that his service while so employed has been certified by a member of the consultant or specialist staff as satisfactory.

Note: the signature below should be that of an officer of the board of governors, hospital management committee, or other employing body authorized to act in this behalf.

Title of hospital or institution.....
Description of post(s).....
Periods of employment: from.....to.....
Signed.....Official position.....Date.....

The suggested form of certificate of experience to be given by licensing bodies in support of an application for full registration is as follows:

Under subsection (2) of section 2 of the Medical Act, 1950, it is hereby certified that the.....(University or other Corporation) are satisfied:

(1) That.....has, after passing a qualifying examination, been engaged in employment in a resident medical capacity in one or more approved hospitals or approved institutions as defined in the Act for a period of not less than 12 months—namely, months;

(2) That during the said period the applicant has been engaged in medicine for a period of not less than six months—namely, months;

(3) That during the said period the applicant has been engaged in surgery for a period of not less than six months—namely, months.

(4) That any time spent in midwifery which has been counted for the purpose of the foregoing paragraphs (2) and (3) as time spent in medicine or as time spent in surgery is a period not exceeding six months—namely, months.

(5) That any period of employment in a health centre which has been reckoned towards the completion of the periods in medicine and in surgery is a period not exceeding six months—namely, months.

(6) That the service of the applicant while so employed has been satisfactory.

Signed.....Official position.....Date.....

The certificate has to be signed by an authorized officer of the university or corporation granting the qualifying diploma by virtue of which the applicant claims registration.

The General Medical Council has expressed itself satisfied that the compulsory internship schemes adopted in New Zealand and in the Union of South Africa may be regarded as substantially equivalent to the United Kingdom scheme for the purpose of ensuring that newly qualified practitioners shall acquire, as a condition of full registration, such experience as is specified in the Medical Act, 1950. Accordingly full registration is given to practitioners who have been registered in New Zealand or in South Africa after rendering appropriate service under the compulsory internship scheme in operation in the country concerned.

The Council has set up a committee, consisting of the president (Sir David Campbell), Sir Henry Cohen, Dr. H. G. Dain, and Sir Cecil Wakeley, to consider and determine applications for the registration of Commonwealth and foreign practitioners which are not determinable under its general resolution.

Fees for Registration

The fees payable to the General Medical Council for registration under the Medical Acts are £5 5s. on provisional registration, and on full registration in the case of a person already provisionally registered, £6 6s., or in the case of any other person, £11 11s. Any person registered by virtue of section 7 of the Medical Practitioners Act, 1951, of the Republic of Ireland pays no fee on provisional registration, and pays a fee of £6 6s. on full registration.

On temporary registration by virtue of section 8 of the Medical Practitioners and Pharmacists Act, 1947, for a period of six months or less the registration fee is £2 2s.; for any period between 6 and 18 months, £5 5s.; and over 18 months, £11 11s.

On the insertion in the *Register* of any higher degree or additional qualification or of an additional recognized Commonwealth or foreign diploma, a fee of £1 is paid, and a fee of £2 on the entry of a recognized diploma in public health, sanitary science, or State medicine. The fee for restoration to the *Register* after erasure under section 14 of the Medical Act is £1.

The address of the General Medical Council is 44, Hallam Street, London, W.1.

UNDERGRADUATE EDUCATION

The Provisional Year

The year 1953 has seen the introduction of the pre-registration year as required by the Medical Act, 1950. The general testimony of the schools is that the introduction has been effected with the minimum of trouble. Thus from Leeds the Senior Administrative Officer in the Faculty of Medicine tells us that, "thanks to the co-operation of the regional hospital board and the hospital management committees in the region, the scheme got off to a very satisfactory start." From the Welsh National School of Medicine the Provost says that the filling of approved posts in approved hospitals in terms of the Act has been carried out with little difficulty, leaving a certain number of vacancies for young practitioners from other schools. From Bristol the Dean writes that the medical students first to be affected by the Act have had no difficulty in finding posts, as the number of approved posts in the region considerably exceeds the number of students qualifying annually. Most of them have obtained posts in Bristol itself, and only three, for personal reasons, have gone outside the south-western region. So with other provincial schools.

In London the Dean of Guy's states that pre-registration appointments are available for those newly qualified, and every encouragement is given to men of promise to obtain the higher degrees and diplomas. The Secretary of St. Thomas's says that, of the first big batch of students qualifying, those who failed to get pre-registration appointments at St. Thomas's have had little or no trouble in obtaining suitable posts outside. He adds that the new regulations appear to create only one difficulty, and that is of maintenance before the first appointment is obtained, and between that and the subsequent one.

The Sub-dean of London Hospital Medical College also states that the introduction of pre-registration house appointments has not so far produced any major difficulties, but he considers it unfortunate that the General Medical Council should have been unable to put newly qualified men on the *Provisional Register* until the university or college concerned had conferred its degree or had officially met to issue the diploma. This has resulted in an unfortunate delay between qualification and starting work, and all the financial and other difficulties which are bound to result from such a time lag. He goes on:

"In general, the most obvious weakness in postgraduate training at the present time is that men are called up into the Forces 12 months after qualification. The number of London Hospital graduates who have not in the recent past done two six-months house appointments is very small, and, therefore, pre-registration does not make much difference to them, but the majority would welcome the opportunity of 18 months of house appointments whether they later go into practice or into a specialty. In the former case most men wish to hold a house-physician's and a house-surgeon's post, and then spend six months in a midwifery appointment with a view to taking the diploma of the Royal College of Obstetricians and Gynaecologists. The men who have decided to specialize also require an uninterrupted 18 months' work after qualification, and it should be noted in this respect that the Royal College of Physicians, for example, will not allow a candidate to enter for the membership until he has

been qualified 18 months. We feel that very great advantages in postgraduate training would result from an extension of the deferment from National Service after qualification from the present 12 to 18 months, and, although no doubt this would produce administrative difficulties in the transitional stages of such an extension, eventually the Forces themselves would benefit from having better-trained junior medical personnel."

LONDON UNDERGRADUATE SCHOOLS

The University of London comprises twelve undergraduate medical schools, each of which is connected with a principal teaching hospital and with one or more—in two cases with as many as five—associated or constituent hospitals.

It was intended, as stated in the Educational Number of the *British Medical Journal* last year, that from October, 1953, revised regulations for the preclinical courses for the M.B., B.S. degrees would be introduced in the medical schools of Guy's, Middlesex, Royal Free, St. Bartholomew's, St. Mary's, St. Thomas's, and University College Hospitals. It has not, however, been possible to implement these new regulations of the University, and the new preclinical curriculum has had to be indefinitely postponed. Therefore the procedure for entry at these schools remains unchanged for the coming year. The University has also decided that the new regulations shall not come into force in October, 1954.

There follows some account, for which we are indebted to the respective deans or secretaries, of the individual schools.

At *Guy's Hospital Medical School* the first three years of preclinical studies are designed to prepare the student for the clinical work which will follow, and particularly for the eventual practice of medicine. There is a close link between the medical school departments and the wards. Oxford and Cambridge students are admitted for the three clinical years. The aim at *Guy's* has always been to encourage responsibility from the moment the student enters on ward work. A three-monthly series of clerkships is arranged in the general wards and in special departments, so that students accept supervised responsibility for patients, and the emphasis is on bedside and out-patient teaching rather than organized lectures. There are, however, lectures and demonstrations organized by the directors of the departments of surgery, medicine, obstetrics, paediatrics, and anaesthetics, to cover the whole curriculum. Pre-registration appointments are available for the newly qualified.

Middlesex Hospital Medical School, owing to the University's decision that the new regulations for the preclinical curriculum shall not at present come into force, is continuing to admit students on the same lines as in the past, that is to say, either for first M.B. work, or, if they have obtained this examination externally, direct to the second M.B., and, in the case of students from Oxford and Cambridge, direct to the clinical course. These latter students are admitted in October or April each year, the preclinical students starting only in October. At the beginning of the clinical course all students attend the introductory course for three months before starting their ward appointments. On qualification there are numerous provisional registration posts available within the hospital. By the beginning of the next session a small extension to the department of anatomy will have been completed; this will afford increased facilities for the teaching of histology. The new Institute of Clinical Research and Experimental Medicine will also open in October and will provide the medical and surgical staff of the hospital with excellent facilities for research. The number of applications received for admission to *Middlesex* remains far in excess of the number of places available. Students wishing to apply for admission to either the preclinical or the clinical course are advised to do so eighteen months or two years before the date at which entry is required.

Final-year Students and General Practice

A scheme has been introduced this session at the *Royal Free Hospital School of Medicine* by which clinical students in their final year^a may spend a fortnight with a general

practitioner, attending surgeries and rounds, and learning something of the organization of a practice. It has now been possible at the Royal Free to make a start on converting the rooms in the old buildings left empty on the transfer of two departments to the new wing. This work should be completed in the summer vacation. At the hospital a new clinical lecture theatre has been erected, with a seating capacity of 150, and the extension of the Obstetrical and Gynaecological Department at Liverpool Road is now almost ready for occupation. The number of applicants for admission remains much greater than the places available, but it is now possible to admit a larger number of students in the first year. From October the school will be admitting a group of students from the Royal Dental Hospital School for the preclinical course only. The school received during the year a legacy of some £50,000 through the generosity of the late Dr. Annie McCall. The fund is being used to found the Annie McCall Postgraduate Fellowship in Midwifery, open to any woman graduate, and having a value of not less than £1,000 a year, which may be held by one recipient for a period not exceeding three years. Fifty-five students have gained qualifying degrees during the past twelve months, including one with honours in medicine and one with honours in obstetrics and gynaecology. The preclinical teaching staff numbers 47, and the clinical 82, these being members of the clinical staffs of the Royal Free Hospital teaching group. The students last session numbered 472 (including 12 postgraduate). The annual intake is approximately 120.

The current academic year opened at *St. Thomas's Hospital Medical School* with an entry of 87—44 first-year, 10 second-year, and 33 clinical students. During the past year 88 students qualified with a university degree, while in 1951-2 45 old members of the school achieved higher degrees or diplomas (13 the Membership and 15 the Fellowship of the Royal College of Surgeons, 13 the degree of Doctor of Medicine, and 4 that of Master of Surgery). Statistics are definitely showing that from the academic point of view the second-year entries are much higher than those who start as premedical students. The qualification rate of Oxford and Cambridge graduates remains very high. There have been no major changes in the school during the past academic year. Two new temporary lecture theatres which should be ready by October will help to relieve the congestion during full term and make examinations much easier to administer, as they will now cause no upset of teaching. In the hospital itself at long last some new building has started. The school and hospital are now stabilized after the upheavals of the war, and both are looking forward to a period of reconstruction. Planning is going on for the school, and it is hoped that future generations will see buildings worthy of the beautiful site that the hospital is fortunate enough to occupy.

No special developments have to be recorded at *University College Hospital Medical School* during the past year. There has been no falling off in the number of applicants for places, and it has in fact been difficult to keep down the entry to the ideal number to be taught on the available hospital beds. It is perhaps worth recording that for the first time in the history of this school Part I of the London final examinations was held here as an internal examination. The school has acquired a new playing field at Hendon.

At *St. Mary's Hospital Medical School* the number of applicants still greatly exceeds the number of places available, and during the last session nearly 700 applications were received, out of which 105 students were admitted. Work has begun on the alteration of nine houses in Sussex Gardens which will provide residential accommodation for 80 students. The alterations should be completed by the middle of the session, and, as almost half the students at the medical school live in lodgings, a hostel so near at hand will be greatly appreciated. It is hoped that work on a further nine houses, to provide accommodation for 88 students, will start as soon as the first part of the hostel is open, and this will mean that eventually the majority of

students who at present live in lodgings will be accommodated in the hostel. Dr. K. W. Cross, senior lecturer in physiology, has been appointed reader in human physiology in succession to Dr. J. L. Malcolm, who will be taking up a post at the National Institute for Medical Research in October. Dr. A. d'A. Bellairs, lecturer in anatomy in the University of Cambridge, has also been appointed reader in anatomy in place of Dr. J. J. Pritchard, who is now professor of anatomy at the Queen's University, Belfast. The course of lectures on preventive medicine has been revised and expanded, and a number of visiting lecturers have been invited. Preparatory arrangements are being made to celebrate the centenary of the school next year.

Revised Clinical Curriculum

The year has seen the introduction at the *London Hospital Medical College* of a revised clinical curriculum. This now consists of the introductory course, a year of in-patient clerking and dressing, a three-months pathology course, and then a year in special departments, following which there is a period of up to five months during which the student attends general out-patient departments and also has a chance to reflect on his studies before going up to his finals. This is clearly resulting in a great improvement in the facilities for study in the major special departments of the hospital. The number of applicants for places at the London has remained very much the same as in recent years, though some signs of reduction had been expected by now. As usual, about half the students joining the school have obtained first M.B. exemption from school, and the remainder come to the school after one year at Queen Mary College, one of the schools of the University. There is a slightly increasing tendency for students to leave school with exemption from two parts of the first M.B., and thus they have to spend one year studying biology. The demand from postgraduate students for general teaching at the London Hospital continues to be high, and the course in advanced medicine from January to March is very well supported.

St. George's Hospital Medical School has for some time submitted to the handicap of cramped and inconvenient premises on the assumption that rebuilding was imminent. When it became obvious that no such project would be completed for at least a decade, the school, with the help of the University of London, embarked on a plan of reconstruction at Hyde Park Corner, of which the greater part has now been completed. The administrative offices and students' refectory and club were moved over a year ago to larger premises adjoining the school in Knightsbridge, while the old buildings were converted for the use of the department of pathology. The school now has an excellent building of three stories with adequate space to house pathological teaching and research. Increased facilities for clinical teaching are still needed, but, in view of the recent designation of another hospital, the situation should improve before long. In the meantime by rigidly restricting the entry to 45 students a year it is possible to maintain the *St. George's* tradition of personal instruction to small classes at the bedside.

Progress in Cramped Quarters

Charing Cross Hospital Medical School has had yet another year of progress in many different directions. Particularly in the clinical years additional facilities have become available so that those who graduate are given every opportunity to have first-hand knowledge of medicine in its widest aspects. The teaching staff of the school fully realize the importance of the application of theoretical knowledge to the practice of medicine, and this is borne in mind throughout the whole of the years of instruction. It is realized that the examination results furnish only one method of assessing the results of such a policy, but they have the merit of giving a statistical basis of assessment.

When it was found that the University of London was unable to furnish the money necessary for opening the

departments of chemistry, physics, and biology, or to start the new integrated course for premedical subjects, immediate arrangements were made with the Northern Polytechnic for first M.B. students to undertake their studies in a special class devoted to Charing Cross students; 85% of those who took this course completed their first M.B. The second M.B. subjects of anatomy and physiology were given an equally satisfactory pass-list.

During the clinical period the curriculum has been made more practical and realistic in several directions. The facilities for instruction in midwifery have been increased by an arrangement whereby students attend domiciliary confinements in London, and, now that the Kingsbury Maternity Hospital is part of the Charing Cross group, rebuilding is taking place at Kingsbury, which will in the near future furnish an up-to-date unit sufficient for teaching institutional midwifery to all the students. The time for which students are attached to selected general practitioners in their final six months has been reduced to three weeks. Increasing experience shows the extreme value of this tuition, and it is regarded enthusiastically by most of the students and practitioners concerned. The students themselves have responded to these increased teaching facilities by working hard. Of the 27 candidates who presented themselves for the first time at the M.B., B.S. (Lond.) examination on the last occasion, 22 qualified at the first attempt (incidentally including all the women). Two further successes in the M.S. (Lond.) examination now place this medical school almost at the head of all the medical schools in London for the number who have obtained the M.S. degree in the last three years.

The one great difficulty is still the cramped quarters in which the school is situated, but every effort is being made to find new accommodation and to alleviate the conditions under which everyone is working. Although the purchase of the 47 acres at Northwick Park for the site of the new hospital and medical school has now been completed, financial stringency makes it improbable that a start on the actual buildings can be made for some little time. Meanwhile during the summer vacation the school is being made more habitable by redecoration of the whole of the inside and outside of the present buildings in the heart of London.

The preclinical departments of *St. Bartholomew's Hospital Medical College* are now situated in Charterhouse Square. Here and at the hospital adequate facilities are available for instruction in all subjects, including pathology and midwifery. Over 100 hospital appointments are available each year to students who have passed their qualifying examination. Clinical appointments are available for undergraduates each quarter. Scholarships and prizes to the value of £2,000 are awarded annually.

Facilities for Research

King's College Hospital Medical School provides the clinical training for students reading for the degrees of London, Oxford, and Cambridge. The hospital serves a large residential area and has one of the busiest out-patient departments in London. The preclinical subjects are taught in the Faculty of Medical Science, King's College, London, where students are admitted for either the first or second M.B. course. At the college the students have the advantage of full college life and of associating with students of all the faculties.

The clinical curriculum is kept under constant review, and in January of this year some modifications were made in the clinical introductory course, to which great importance is attached. Upon the successful results of a pilot scheme every student now has the opportunity of seeing at first hand something of the work of a general practitioner. It is hoped that more time may be allotted to this valuable experience when the scheme is fully established.

Progress has been made in facilities for research at King's College Hospital Medical School. The Cowburn Research Fellowship has been established with a fund of about £35,000. Regulations have been approved and the first

Cowburn Fellowship is now being advertised. A suite of rooms in the hospital is being adapted to provide additional research accommodation, and research projects are assisted on the recommendation of the recently established King's College Hospital and Medical School Joint Research Committee. The larger part of the funds for research are provided by the hospital from its endowment funds; the Medical School Council has also made available for research certain of its trust funds.

The medical school has made arrangements with the Faculty of Medicine of the University of Toronto for an exchange of medical staff. The first exchange will take place this summer, when one of the King's registrars will leave for Toronto and King's will receive a doctor from that city, the holder of a Markle scholarship. A new demonstratorship in morbid anatomy has been established with the object of providing experience in laboratory methods and research for intending clinicians.

King's College Hospital is fortunate in having 23 approved intern posts available every six months for its newly qualified students. No difficulty has been experienced in securing posts elsewhere for the few students who have not been appointed to pre-registration posts within the teaching hospital group. During the 12 months up to May of this year 45 students gained qualifying degrees in medicine and dentistry in the Universities of London, Oxford, and Cambridge, including two with honours. Forty-seven students obtained the diplomas of the Conjoint Board.

At *Westminster Hospital Medical School* the number of clinical students in attendance is 203, of whom 16 are women. Sixty-six students are carrying out their preclinical studies at King's College, Strand, with a view to entering Westminster for the clinical period. Some 600 applications were received last year for an annual entry of 65; half are working for London University degrees and the remainder for Oxford and Cambridge degrees. There are 430 beds at Westminster Hospital for clinical practice allocated to general medicine, surgery, and obstetrics. The orthopaedic, the ophthalmic, and the ear, nose, and throat departments are also in the main hospital. Special instruction in paediatrics is provided at the Westminster Children's Hospital, where there are over 100 beds. The University has conferred the title of Reader in Bacteriology on Dr. B. W. Lacey, and of Reader in Morbid Anatomy on Dr. A. D. Morgan, and has added Mr. P. D. Trevor-Roper to its list of teachers recognized in ophthalmology. Mr. H. E. Lockhart-Mummery has been appointed to the newly instituted post of tutor in surgery.

The scheme of occasional lectures to the firms in general medicine and general surgery by distinguished visitors from other institutions has been continued at Westminster with success.

Forty vacancies a year in the Westminster Hospital teaching group have been recommended for pre-registration purposes and competition for these is keen. Visits to the surgeries of general practitioners and the use of the Nelson Hospital, Wimbledon, for midwifery instruction, by permission of the St. Helier Group Hospital Management Committee—both reported last year—have continued with success, and, in addition, members of the general medicine firm attached to St. Stephen's Hospital, Fulham, reside there in turn for part of the three-months period. This innovation has proved popular and is undoubtedly in the interests of the students. The various students' clubs are vigorously alive.

ENTRY AT OXFORD AND CAMBRIDGE

Oxford University Medical School.—The number of preclinical students is restricted by decree. Selection of candidates is made by a central university committee; their names are put forward by the colleges, and preliminary acceptance by a college is essential for any prospective medical student. Students reading medicine at Oxford must in addition qualify for a B.A. degree. Most medical students do this by taking

the final honours school of animal physiology, which normally occupies them for one year after they have taken the first B.M. examination in organic chemistry, anatomy, and physiology. After taking the B.A. degree most students do a course of general pathology, bacteriology, and pharmacology, lasting two terms, before going on to their clinical studies. The clinical section of the school has a very limited entry, so that a high degree of personal supervision and opportunities for practical experience may be ensured. Usually about two-thirds of the clinical students are drawn from the Oxford preclinical entry; the remainder come from other universities. The University hopes by assembling such a mixture of students to minimize any risk of parochialism among students who receive their entire medical training at Oxford. The Radcliffe Infirmary (505 beds) is the main teaching hospital, and is an active centre of clinical research, but practical instruction is given also in the other members of the United Oxford Hospitals Group (1,250 beds) and in the Wingfield Morris Orthopaedic Hospital and the Littlemore Hospital for mental cases. In both medicine and surgery students spend half their time in a "firm" of four students and half in a "firm" of eight.

Cambridge University Medical School.—Admission to the University of Cambridge may be secured only by members of the colleges and of Fitzwilliam House. Most of the colleges will not admit candidates for the degree of M.B. and B.Chir. unless they have passed or secured exemption from three parts of the first M.B. examination. All college entries are subject to a university quota, and the number wishing to enter still exceeds the number of places available (about 220 per annum). Before a candidate can be admitted to the final M.B. examination he must obtain honours in a tripos (or if over standing for honours standard, in Part I of the natural sciences tripos), must reach a qualifying standard in anatomy and physiology (or pass a qualifying examination in those two subjects), and must pass an examination in pharmacology. Part I of the final examination—the basic subjects of pathology, pharmacology, and therapeutics—may be taken after two years and three months of clinical study. Part II, comprising medicine, surgery, and midwifery and gynaecology, may be taken two years and nine months or more after beginning clinical studies. Excellent facilities for bridging the gap between the preclinical and clinical periods are provided by the Long Vacation courses in elementary clinical methods and introductory psychology (including practical demonstrations) held each year in July and August. The course in elementary clinical methods is concentrated on instruction in the simple technique of making a proper examination of patients attending the general and special departments of a hospital; it includes lectures on the career of medicine, the social background of disease, epidemiology, and the practice of medicine in the home.

MEDICAL SCHOOLS IN ENGLAND AND WALES

An Intelligence Test on Entry

An innovation has been introduced in the *University of Birmingham Medical School* in that students on admission into the second year (the first preclinical year) are required to undergo an intelligence test conducted by the professor of education. As a result of this, each student at the outset of his career is given an intelligence quotient, and in the light of his subsequent performance it is hoped to gain information whether tests of this kind are likely to give any worth-while forecast of the student's aptitude for medicine. The tutorial system, which was instituted last year at Birmingham, whereby members of the clinical staffs of the hospital offer to undertake the role of tutors for groups of four or five undergraduates during their years of hospital work, has made a good beginning.

There have been two other interesting innovations at Birmingham. One of these, which was started a year ago, is a scheme on a voluntary basis whereby students in their final year may be attached to a general practitioner for two weeks in order to familiarize themselves with the work of general practice. The scheme was inaugurated by an informal discussion over a buffet supper to the participating practitioners and students, and many helpful suggestions for the future were made. The scheme is regarded as an improvement on the formal teaching of the intricacies of general practice by a university department. The other innovation was an exchange of students for two weeks with the University of Lyons. It is stated that the visit of the British students to the French university was not only enjoyable but instructive and helpful, giving them an insight into clinical work on the Continent.

The number of applications received for admission into the Birmingham Medical School shows little sign of falling, but the remark is made that, generally speaking, the quality of the applicants is not as high as formerly. The necessary arrangements to satisfy the requirements of the Medical Act, 1950, have worked smoothly, and all newly qualified graduates are in pre-registration posts. To endeavour to obtain the fullest possible working co-operation between the Faculties of Medicine and Science, the clinical research unit, which is expected to be opened before the end of the year on the Queen Elizabeth Hospital site, will not only have accommodation for research work in the clinical departments but later a department of microbiology in the same building, to house members of the Faculty of Science who are interested in that subject. This is a notable year in Birmingham Medical School history, for both the Vice-Chancellor and the Vice-Principal of the University are not only medical men but Birmingham graduates.

Student Exchange Scheme

At the *Medical School of the University of Durham* the number of applications for admission during the academic year beginning in October next has been approximately the same as last year, and competition for entry has therefore been quite keen. Most candidates apply for direct entry to the second-year course by qualifying for exemption from the first M.B., B.S. examination by virtue of passes in the subjects of chemistry, physics, and biology at the advanced level in the general certificate of education examination. Plans for the first stage of necessary extensions to the medical school have now been approved and building operations authorized. The extension of the present building will provide much needed additional accommodation for the department of physiology and for the teaching of pharmacology. Student activity has been as keen as ever. The annual meeting of the British Medical Students' Association was held at Newcastle-upon-Tyne last year, and was very successful. The Durham Medical Students' Union has again arranged a student exchange scheme with the Medical School at Oslo, and several Norwegian students have been welcomed at Newcastle during the summer vacation.

The session 1952-3 in the *Medical Faculty of the University of Bristol* has seen an increase in the number of students in the Faculty in that the maximum number of students who could be accommodated were admitted to the dental school and an additional year has been added to the veterinary school. The first students to take veterinary medicine at Bristol University are about to enter their final year. Work is about to begin on additional laboratories and a lecture theatre in the department of medicine. The main operating theatres in the Royal Infirmary have been equipped with new sterilizers, and air-conditioning has been installed. Research has carried some members of the staff far afield. A team from the pharmacology department, under the auspices of the Medical Research Council, visited Uganda to make some metabolic studies, and another from the department of anatomy is at present studying in Switzerland the effects of altitude on bone marrow. Some changes

have been made in the regulations for dental qualifications. In future the candidates for the diploma as well as the degree will be required to matriculate, and will take the same examinations up to the final. The B.D.S. course will be six months longer than that for the L.D.S., and the final B.D.S. examination will have an extra section to be taken at the end of five and a half years' study.

The intake of medical students at the *University of Liverpool* in 1952 was 71 men and 23 women. Of this number 46 were admitted to the first year of study and 48 to the second. It is stated that the number of applicants seems to be increasing, but the main factor in this apparent increase is the growing practice of candidates to apply to several medical schools. A new clinical curriculum has come into force the main features of which are: (1) that the present Part III of the final M.B. examination will be discontinued, forensic medicine becoming a subject (with pathology and bacteriology) of Part II, and public health a subject of the final qualifying examination; and (2) that systematic lectures during the first five clinical terms will be given only at 9 a.m., the students spending the rest of the day in the hospitals to which they are assigned, whereas previously they returned to the medical school for an afternoon lecture.

A new medical school building is in course of construction. The first part, which will be ready for occupation towards the end of 1954, will house the departments of pharmacology and bacteriology. The framework of the new block consists of reinforced concrete columns and prestressed concrete floor beams—a technical development in construction used for the first time in this country. This year the University of Liverpool celebrates the fiftieth anniversary of the granting of its charter. Sir Ronald Ross and Sir Charles Sherrington were members of the first senate.

Changes in M.B. Courses

The *School of Medicine at Leeds* admits 75 students each year, and the number of persons seeking admission still greatly exceeds the number of places, though it is remarked here, as it was at Birmingham, that there seems to be a shortage of really good candidates. During the last year the first M.B. course reverted to three terms, and consisted of four subjects—physics, chemistry, zoology, and botany. The content of the chemistry course is greater than that of many other degree (first M.B.) courses, and it is considered an advantage that candidates should have studied this subject at advanced level in the general certificate of education, although the minimum requirement is that they should have passed at ordinary level. Complete exemption from first M.B. is not often given at Leeds. As from next October the second M.B. course will be a five-term instead of a six-term course. The revision of the clinical curriculum is under consideration, and it is hoped to start detailed plans in the coming session.

Developments in the school are hampered to a large extent by lack of accommodation. In order to overcome this the University is continuing its policy of adapting houses in the neighbourhood into research laboratories. In particular the departments of biochemistry and medicine will, it is hoped, soon be given additional accommodation in this way; and as soon as possible more accommodation will be given to the departments of medical physics, radiology, and anaesthetics.

Of the changes made in ordinances and regulations of the *Faculty of Medicine at Sheffield* only two appear to call for notice here. Pathology and bacteriology will each now form a separate part of the third M.B. examination; and when the degrees of M.B., Ch.B. are awarded with "honours" there will in future be no division into first class and second class. The University has accepted an offer from Boots Pure Drug Company, Limited, to establish an annual prize in pharmacology in memory of the late Sir Jack Drummond. While no extensive new building can yet be reported at Sheffield, the adaptation of existing pre-

mises has permitted considerable enlargement of the department of biochemistry. On the hospital side the expected opening in the autumn of the Charles Clifford Dental Hospital will greatly increase the clinical facilities open to the dental school. During the year the school suffered a loss through the death of Mr. J. E. Stacey, a noted clinical teacher of obstetrics and gynaecology, and the resignations, on their appointment to chairs in other universities, of Professors E. J. Wayne and H. N. Green.

In the *Manchester Faculty of Medicine* 97 new students were admitted in October, 1952, 17 of them direct to second-year courses. The formal entrance requirement in mathematics has been discontinued, but it is strongly felt that applicants for admission to medical study should not underestimate the importance of appropriate preparation in mathematics. The discontinuance of the formal faculty requirement enables intending applicants to get appropriate preparation in this subject in the most convenient way on advice from their schools. The regulations governing Parts II and III of the final M.B., Ch.B. examination have been modified in the light of experience. Candidates who present themselves in all four subjects of the final examination may in certain circumstances be allowed to pass in any two or three of these.

The Clinical Sciences Building in York Place, Manchester, is now complete and occupied by the departments of pathology, medicine, social and preventive medicine, occupational health, oto-laryngology, rheumatism research, and obstetrics and gynaecology. The space vacated in the medical school will ease the problems of accommodation, and extensive alterations are being carried out in the old building.

Welsh National School of Medicine

The new regulations for the degrees of M.B., B.Ch.(Wales) are now affecting students entering the clinical years of study in the *Welsh National School of Medicine*. The change of date for ending the preclinical period and beginning the introductory clinical course in the transitional summer term has brought with it inevitable difficulties in connexion with not only those students of the school who fail in anatomy and physiology at the first attempt in March but also with students from some other schools who wish to pursue their clinical studies at Cardiff. Satisfactory solutions are, however, being devised. Further, the complete revision of the curriculum and time-table which has been undertaken has involved much work for the clinical dean and the office staff. It looks as if the gradual change from the old to the new system will take place smoothly enough.

The amendment of the M.D. regulations is under active consideration with the object both of raising the standard of the examinations and of throwing the degree open to a wide group of graduates by placing more emphasis on a thesis or published work and less on clinical proficiency.

The very large undertaking of preparing a scheme for an entirely new medical and dental teaching centre has reached the end of its first stage, and a long and detailed report has been submitted to the Welsh Board of Health and the University Grants Committee. As it is intended to hold an architectural competition, no preliminary plans have been prepared, but the report is mainly in a form appropriate to the preparation of schedules for such a competition.

The annual intake of medical students at present is 65. The number admitted each year to studies for the B.Pharm. is 35, to the course for health visitors 23, and to systematic instruction in midwifery 54 pupil midwives. Co-operative arrangements with the teaching and regional hospitals for short-term visits of consultants to the school have been successfully conducted throughout most of the year.

For the first time in the history of the school the chair of obstetrics and gynaecology has been made whole-time. It has been filled by Mr. Archibald Sutherland Duncan.

SCOTTISH AND IRISH SCHOOLS

In *Glasgow University* the last full year of students who followed the former five-year curriculum have qualified this summer and there will be only a small number of medical graduates from this school until July, 1955, when the first year of students pursuing the six-year curriculum will have completed their course and be due to graduate. Within the teaching establishment no new senior posts have been created, but retirement under the age limit is this year producing more than the usual number of changes in senior teaching personnel. The junior teaching staff has been augmented by a number of additions in the lecturer grade to the establishments of several individual departments.

There have been no changes of major importance during the year in the arrangement of the curriculum, but some minor reorganization of classes in the specialties has been undertaken with a view to spreading this instruction over a longer span of the whole clinical period. The main development in the Faculty of Medicine during the year has concerned the veterinary school. The first year of veterinary students to complete their university curriculum will appear for graduation in July, 1954.

The number of applications for admission in 1953 at *Edinburgh University* to the course leading to the M.B., Ch.B. degrees has continued to be high in relation to the number of places available. The degree course occupies six years, and the stage has been reached where students begin in October next the final year of this curriculum. First-year students for degrees in medicine, dentistry, and veterinary medicine attend the same first-year course, which has now been revised to permit students to take the first professional examinations in two parts, one in March and one in June, instead of all four subjects in June as formerly. With effect from June 2, 1953, there will be a new requirement that two copies of theses for the degree of M.D. must be lodged.

More places are now available in the School of Dental Surgery at Edinburgh for the five-year course leading to the degree of B.D.S. The five-year course for the degree in veterinary medicine and surgery (B.V.M.S.) began in October last.

In the *School of Medicine of the University of St. Andrews* instruction in the subjects of the clinical years of study is given in Dundee, while the premedical and pre-clinical subjects can be studied in either Dundee or St. Andrews. The annual intake of students to the Faculty of Medicine is limited to between 70 and 80 entrants to ensure that the hospital facilities available are sufficient to allow of adequate clinical instruction being given to each undergraduate as advised by the Goodenough Committee.

In October, 1948, the six-year curriculum, recommended by the General Medical Council, was introduced, and the necessary rearrangement of work in the later years of study has now been completed. The Dean of the Medical School at Dundee expresses the view that so far the introduction of the National Health Service has had but little influence upon the undergraduate; it has, however, called for a complete reorganization of postgraduate instruction with a view to the training of specialists.

At both St. Andrews and Dundee there are excellent student residences which accommodate graduates from any of the faculties. Medical students in their early years are encouraged to reside in these so that there is a width of contact among the undergraduates at this university which is of great educational value. In addition, the William Low residence for medical students, situated near the principal teaching hospital, is devoted exclusively to undergraduates in their clinical years of study. The University of St. Andrews has instituted chairs in social medicine and in child health, so that in this respect also the

recommendations of the Goodenough Committee have been fulfilled.

In the session 1952-3 at the *School of Medicine, Aberdeen*, there were 541 students. By resolution of the *Senatus Academicus* and approved by the University Court a candidate for examination in the subjects of the first M.B., Ch.B. degree examination must enter for all the subjects together. A candidate who fails to pass in all three subjects at one Diet of Examination may obtain exemption from further examination in one or in two of the subjects provided that he attains a higher standard than the ordinary pass mark in such subject or subjects. Final-year medical students are attached to general practitioners in the district for one month in order that they may gain experience of general practice. The new building in Old Aberdeen in which the department of chemistry and related departments are to be housed has been opened since last September.

At the *Queen's University of Belfast* the maximum number of students (including dental students) who can be admitted to the medical school in any one year is 108. The six-year curriculum in the medical school now includes a special course in clinical tuberculosis for final-year students. Arrangements have also been made for a series of undergraduate lectures by a general practitioner. Next year a scheme for domiciliary midwifery will be introduced. Instruction will be undertaken by a panel of six general practitioners. The new Institute of Clinical Science at Belfast is approaching completion and will be occupied during the coming academic session. It will add greatly to the facilities for teaching and research.

The entrance requirements at Queen's are: (a) the passing of the matriculation examination in five subjects, three of which are compulsory—namely, English, mathematics, and a modern language; (b) if the five subjects do not include Latin, the passing of this subject at a qualifying examination; and (c) the passing of the premedical examination in physics and chemistry or other examinations recognized by the University as equivalent thereto.

The *School of Physic, Trinity College, Dublin*, provides a complete training in the medical sciences in preparation for the degrees of M.B., B.Ch., and B.A.O. of the University of Dublin. Medical students are required to take a modified Arts course leading to the degree of B.A. All courses and degrees are open to men and women alike. External students are not accepted. Outstanding recent developments at Trinity College have been the establishment of the Moyne Institute of Preventive Medicine and of the new school of social medicine.

The constituent colleges of the *National University of Ireland* are those of Dublin, Cork, and Galway. Between 200 and 300 students graduate in medicine from these colleges each year.

The Royal College of Surgeons in Ireland admits to the pre-registration classes approximately 100 students each year. The normal method of entrance is by competition in the preliminary examination, but a limited number of places are given to those with exceptional qualifications and to certain students selected by the Colonial Office, to which all colonial students should apply, since, owing to limitation of numbers, they cannot be admitted to the entrance examination. Nearly all students take the Irish Conjoint Board's examination, but some take in addition the London examinations. Medical examinations are carried out on students at the beginning of the pre-registration year, and again before the clinical years begin. Two doctors give free medical care to students.

During the past year the laboratory space for chemistry and physics has been doubled, two rooms for advanced work have been added to the anatomy department, and much additional apparatus has been obtained for the pathology department. This is the first experience of the intern year, and no difficulties have been encountered. The address of the Royal College of Surgeons in Ireland is St. Stephen's Green, Dublin.

APPOINTMENTS OVERSEAS

The Colonial Medical Service

Openings in the Colonial Medical Service occur in all parts of the world, the largest number being in Africa, Malaya, and the Caribbean area. Candidates must be British subjects holding medical qualifications registrable in the United Kingdom and should have had at least 12 months' postgraduate experience in hospital before appointment. For the permanent service candidates must be under 40 or 45 years of age, varying according to the age of retirement in the territory (in most territories 55). Short-term contract appointments are available for candidates above the age limits or those who do not wish to commit themselves to a Colonial career from the outset. In many Colonial territories there is a scheme whereby doctors in the National Health Service may take up temporary posts up to six years without loss of N.H.S. pension rights. A gratuity is payable at the end of the overseas service, but those eligible for and desirous of transfer to the permanent and pensionable establishment of the Colonial Medical Service may so transfer. Officers appointed to the permanent service are normally required to take a course in tropical medicine and hygiene either before going overseas or during their first furlough.

A large number of specialist appointments exist in the Colonial Medical Service. These are normally filled from the service, and senior administrative appointments are almost entirely filled by the promotion of serving officers. The total number in the various Government medical departments amounts to some 800 European medical officers and an even larger number of officers appointed locally. Vacancies for women doctors arise from time to time, particularly for those with special experience in obstetrics, school health, child welfare, and nutrition.

Full particulars of terms and conditions of service may be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith Street, London, S.W.1.

Other Appointments Abroad

Medical schools overseas employ doctors from the United Kingdom as teachers. The recruiting agency for certain of the Colonial medical schools is the Inter-Varsity Fellowship for Higher Education in the Colonies. Some overseas hospitals, such as King George V Merchant Seamen's Hospital, Malta, and the British Hospital, Lisbon, also employ British doctors, and short-term resident appointments are frequently advertised by Dominion and American hospitals. Medical staffs are also employed by certain commercial undertakings working abroad, including local engineering firms, development corporations, and mining companies. The larger shipping companies offer employment on a more or less permanent basis for about 100 ship surgeons. Application should be made to the various companies at their head office.

A small number of British doctors are attached to certain of the British embassies and legations in capitals in Eastern Europe and the Near East, where they undertake medical care of the staffs and their families and sometimes of other British subjects.

Missionary Medicine

Medical missionary work offers opportunities to medical men and women who wish to give their services where the need is greatest. A doctor who has this service in view is advised to spend 18 months or two years in resident appointments after qualification. Special missionary training is required by some of the societies. Although offers for life service are preferred, the service should be for terms of 18 months to five years, according to the country and the climate. Opportunities for postgraduate study are offered during furlough. Applications from students or qualified men and women should be made either to the secretaries of one of the denominational or interdenominational societies, through the local branch of the Student Christian Movement, or to the chairman, Medical Missionary Board of the Conference of British Missionary Societies, Edinburgh House, Eaton Gate, London, S.W.1.

MEDICAL SERVICE OF THE L.C.C.

The largest local authority in the country, the London County Council, employs about 100 whole-time medical officers in its Public Health Department, and also nearly 500 part-time medical officers. The duties of those holding whole-time appointments in the higher grades are mainly administrative. Generally speaking, the senior officers have graduated through the clinical field, and have special knowledge in at least one branch of the service. The assistant medical officers are mainly engaged in the school health and maternity and child welfare services. Suitable qualifications are the D.C.H. and the C.P.H. or D.P.H. Arrangements are made for some of the officers to have clinical responsibilities at hospitals and to gain experience of environmental health services in the metropolitan boroughs.

The part-time officers are employed in a variety of work—for example, in residential nurseries, welfare institutions, staff examinations, sessional work at clinics, and in school medical inspection. By arrangement with the London School of Hygiene, the Institute of Child Health, and several undergraduate schools, students have the opportunity of gaining experience in the Council's various services.

The salary of the medical officer of health to the Council is £4,000 a year, and that of the deputy medical officer is at present on the scale of £2,050-£250 (biennially)-£2,550.

For divisional medical officers the salary scale varies according to the population of the division (London is divided into nine such areas). In divisions which have a population of up to 400,000 the scale is £1,500-£50-£1,900, and for those with a population of over 400,000 it is £1,600-£50-£1,950. There is one exception to this general pattern—namely, a divisional medical officer who is also medical officer of health of the two metropolitan boroughs comprising his division. His scale is £2,400-£100-£2,600, then plus £50 to £2,650. This officer has two assistant divisional medical officers (£1,470-£1,770 and £1,170-£1,420), each of whom is also deputy medical officer of health of one of the boroughs. The scales of other assistant divisional medical officers are £1,350-£50-£1,650, up to 400,000 population, and £1,400-£50-£1,700, over 400,000. The scales for other grades are: Senior principal medical officer, £1,950-£112 10s.-£2,175; principal medical officers and psychiatrist (whole-time), £1,650-£50-£1,950; senior assistant medical officers, £1,250-£50-£1,500; and assistant medical officers, £850-£50-£1,150 (at present under review following an award of the Industrial Court).

DEGREES AND QUALIFICATIONS

All the universities confer degrees and diplomas admitting primarily to the *Register*. The abbreviations for registration following a pass in the final examination in the universities are M.B., Ch.B. in the universities of Birmingham, Bristol, Leeds, Liverpool, Sheffield, the Victoria University of Manchester, and the four Scottish Universities; M.B., B.Chir. in the University of Cambridge; M.B., B.S. in the universities of Durham and London; B.M., B.Ch. in the University of Oxford; M.B., B.Ch. in the universities of Wales, Belfast, the National University of Ireland, and the University of Dublin; and L.Med., L.Ch., also in the University of Dublin.

About 30% of those who pass the final or qualifying examinations do so under the auspices of one of the three Conjoint Boards—English, Scottish, and Irish. Candidates for the English Conjoint are examined by the Examining Board in England of the Royal Colleges of Physicians and of Surgeons (Examination Hall, Queen Square, London, W.C.1). The diploma is M.R.C.S.Eng., L.R.C.P.Lond. The Board's examinations are held four times a year. The Scottish Conjoint Board furnishes the triple qualification of the Royal Colleges of Physicians and of Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glas-

gow (L.R.C.P.&S.Edin., L.R.F.P.S.Glas.). These three bodies have an arrangement by which, with one series of examinations, students may obtain the diploma. Details may be obtained from the Registrar, 18, Nicolson Street, Edinburgh, 8. The joint licence in medicine, surgery, and midwifery is issued by the Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland (L.R.C.P.I.&L.M., L.R.C.S.I.&L.M.). Regulations can be obtained from the secretary of the Conjoint Board, Royal College of Surgeons, St. Stephen's Green, Dublin.

The Irish Conjoint Board differs fundamentally from the English and Scottish Conjoint Boards in that it has a large teaching school under its control. After passing an approved examination in general education, candidates for the qualifying diplomas are required to do a one-year course in chemistry, physics, and biology, these subjects being treated with special reference to their applications in medicine. After passing the pre-registration examination in these subjects a five-term course in anatomy and physiology is followed. There is then a preclinical term in which an introductory course is carried out at the hospital, and this is followed by three years' clinical work. There are three professional examinations. Candidates are accepted from most of the recognized schools at home and abroad, but in practice 99% of the candidates are from the schools of surgery which are controlled by the Royal College of Surgeons in Ireland with the co-operation of the Royal College of Physicians of Ireland in matters which are within the province of medicine proper.

The Society of Apothecaries of London (Apothecaries Hall, Black Friars Lane, E.C.4) confers a diploma registrable under the Medical Act, 1886 (L.M.S.S.A.Lond.). Examinations for the final subjects are held monthly, except in September, and examinations in anatomy, physiology, and materia medica are held quarterly.

The licentiatehip of the Apothecaries Hall of Dublin (95, Merrion Square, Dublin) entitles to registration under the Medical Act, 1886. It enables the holder to practise pharmacy as well as medicine, surgery, and midwifery, which means that he may, if he so desires, open a medical hall. The Hall is an examining body only. The students who take its examinations are students of a medical school. The reference to pharmacy may be misleading; it concerns only people who are qualifying to become apothecaries—that is to say, doctors, not pharmaceutical chemists.

Diplomas in medicine and surgery registrable in the Commonwealth List are granted by the Universities of Sydney, Queensland, Adelaide, and Melbourne; Ceylon Medical College; the University of Ceylon; the University of Hong Kong; the Royal University of Malta; the University of New Zealand; the universities of South Africa, Capetown, and Witwatersrand, and (in the case of degrees granted on or after October 24, 1947) the University of Pretoria; the King Edward VII College of Medicine, Singapore, the University of Malaya; and the Punjab University, Pakistan. Diplomas of the Universities of Alberta, Manitoba, the Dalhousie University, Nova Scotia, the College of Physicians and Surgeons, Manitoba, the Newfoundland Medical Board, the Provincial Medical Board, Nova Scotia, and the Medical Council, Prince Edward Island, are registrable, provided registration is sought either after examination in the Province concerned or after examination held by the Medical Council of Canada and acceptance by the provincial authorities. Membership of the Colleges of Physicians and Surgeons of Alberta and Saskatchewan is also registrable. The M.D., C.M. of Halifax Medical College is registrable if obtained before August 31, 1911. With some exceptions and subject to dating, the registrable qualifications of the universities of India are recognized. The M.B., B.S. of the University of Rangoon, Union of Burma, if granted on or after December 10, 1936, is registrable. The registration, if previous to January 3, 1948, before the Union of Burma became a foreign country to which Part II of the Medical Act, 1886, applies, is in the Commonwealth List; if after that date, in the Foreign List.

Higher Qualifications

A full list of degrees, diplomas, and courses of instruction for higher qualifications, with details of regulations, and fees and courses, appears in the *Medical Practitioners' Handbook*, published by the British Medical Association.

The Royal College of Physicians of London (Pall Mall East, S.W.1) confers its Membership (M.R.C.P.Lond.) by examination. The pass for Membership is a written examination in the form of a paper on questions of medical anatomy, pathology, and principles of medicine; a paper on questions on the practice of medicine, including the principles of public health, and on psychological medicine; a clinical examination in the clinical wards of a hospital; and an oral examination. Fellowship of the College is gained by election by the Fellows.

The Royal College of Surgeons of England (Lincoln's Inn Fields, London, W.C.2) grants its Fellowship (F.R.C.S. Eng.) to those who pass its primary and final Fellowship examinations. The primary examination, partly written and partly oral, is held in January and July, and the final examination, written, practical, and oral, and including examination of patients, in May and November.

Medical graduates who desire to specialize in obstetrics and gynaecology may apply for entry to the Membership Examination of the Royal College of Obstetricians and Gynaecologists (58, Queen Anne Street, London, W.1). A minimum of three years' residence in hospital posts recognized for the examination is required before application is made. The Fellowship is granted to Members who are judged by the Council to have advanced the science and art of obstetrics and gynaecology. The College also grants a diploma in obstetrics (D.Obst.R.C.O.G.) to practitioners who pass an examination after having special experience in obstetrics in resident appointments recognized by the College.

The Royal College of Physicians of Edinburgh (9, Queen Street) requires of its candidates for Membership that they shall have been qualified for at least two years. The examination is in the principles and practice of medicine and also in a selected department of medicine. Fellows must have been members of the College for at least three years.

The Royal College of Surgeons of Edinburgh (18, Nicolson Street) has a two-part examination for its Fellowship: the first a written paper and oral examination, and the second, a written paper, a clinical and practical examination, and an oral examination in the principles and practice of surgery and in an optional subject.

The Royal Faculty of Physicians and Surgeons of Glasgow grants, after examination, a Fellowship *qua* physician and a Fellowship *qua* surgeon (F.R.F.P.S.G.). Candidates for a Fellowship in medicine must have been qualified for not less than three years and have been engaged during one of those years in full-time clinical work in a recognized hospital and have spent two other postgraduate years in approved medical work. The examinations are clinical, written, and oral. For admission to examination for the Fellowship in surgery the requirements are similar to those for the Fellowship in medicine examination, and the examination is clinical, written, and oral.

The Royal College of Physicians of Ireland grants its Membership on examination. The Fellowship, for which the members of the College are eligible, is granted by election.

The Royal College of Surgeons in Ireland requires two examinations—primary and final—for its Fellowship. The first is in anatomy, physiology, and pathology, and the second in surgery.

All the universities confer the higher qualifications of Doctor of Medicine and Master of Surgery. Liverpool has the degree of Master of Orthopaedic Surgery. At Durham the regulations for the degree of Doctor of Surgery ceased to operate from 1952. The new regulations provide that in order to qualify for the degree of Doctor of Surgery a candidate must be of at least six years' standing from

admission to the degrees of M.B. and B.S. of the University, and the degree will be awarded primarily in consideration of individual contributions to surgical knowledge either published or in the form of a thesis on a subject or subjects concerned with surgery approved by the Board of the Faculty of Medicine. At Leeds the degree of Master of Surgery may be conferred upon Bachelors of Medicine and of Surgery of the University of not less than five years' standing. Candidates for the degree are required to pursue a course of advanced study and research for two years, one year of which may be part-time. University requirements for the higher qualifications vary and particulars should be obtained from the one selected.

The Faculty of Radiologists offers a Fellowship (F.F.R.) to medical graduates of five years' standing who have spent at least one year in general clinical work at approved hospitals, hold a radiological diploma, and, since obtaining it, have practised radiology exclusively for at least two years. Candidates are required to pass an examination. Those who hold higher medical or surgical qualifications may be exempted from the examinations in general medicine, general surgery, and pathology.

POSTGRADUATE EDUCATION

Facilities in London

To provide postgraduate education in London, supplementing the provisions at the undergraduate medical schools and teaching hospitals, a joint board has been set up through which the three Royal Colleges and the British Postgraduate Medical Federation co-operate. Each of the three Royal Colleges arranges courses of lectures in the clinical aspects of its specialties and provides expert advice and guidance on suitable hospital appointments and programmes of study for candidates for its higher qualifications. At the Royal College of Surgeons there is residential accommodation for postgraduate students. The services of the staff at the central office of the Federation (2, Gordon Square, London, W.C.1) are available to all postgraduates, including those from the Commonwealth and Empire, and foreign countries. The Federation is arranging a fourth series of advanced lectures, to be delivered two afternoons a week at the London School of Hygiene and Tropical Medicine during the autumn and winter terms of the 1953-4 session. The lectures are designed specially for research workers and specialists in training and are open to all registered medical practitioners without fee. Further details appear in the advertisement pages of this issue.

British Postgraduate Medical Federation

The British Postgraduate Medical Federation, which is a school of the University of London, comprises the Postgraduate Medical School at Hammersmith (with its university departments of general medicine, general surgery, and pathology) and 14 specialist institutes, each concerned with some clinical branch of medicine or surgery and associated with the special postgraduate teaching hospitals. These institutes are in various stages of development, and the numbers of students who can be admitted to the clinical practice of some of the hospitals are limited. Resident clinical appointments are available in the teaching hospitals to suitable students of the institutes, and these provide the most valuable form of postgraduate education. There are opportunities for research by selected graduates. At all the institutes courses of instruction are given throughout the academic year. These are suitable for graduates in the early stages of their specialist education and also for those who have completed their practical training. Two or more years of hospital work in general medicine and general surgery after graduation are normally advisable before beginning work in the special branches.

The work at the institutes is of an advanced type and comprehensive enough to enable graduates with suitable practical experience to prepare for higher degrees and

diplomas. Emphasis is placed on clinical and laboratory teaching, supplemented by lectures and demonstrations. The Federation awards annually a number of travelling fellowships to graduates working in medical schools or hospitals of the University of London, for the purpose of studying abroad. In addition refresher courses and other forms of continuing education for general practitioners are arranged at hospitals throughout the four metropolitan regions. This is done with the assistance of regional advisers in postgraduate medical education.

It is essential for prospective postgraduate students from abroad to make their arrangements well in advance. Those sponsored by their governments, universities, or other official bodies receive first consideration in the allotment of vacancies. Established specialists from overseas who are here for a short time, and who wish to see something of the practice of this country, are always welcome; they are regarded as visiting colleagues, and the experts in their respective specialties are always ready to receive them and demonstrate their work and teaching. An information bureau of postgraduate activities in London and other university centres is maintained. The director of the Federation is Professor Sir Francis Fraser.

The Postgraduate Medical School of London (Hammersmith Hospital, Duane Road, W.12) has university departments in medicine, surgery, and pathology. The teaching in the clinical departments, based on ward work, is continuous and is supplemented by lectures during three 10-week terms starting in January, April, and October. A course for the University diploma in clinical pathology, lasting one year, is available for a limited number of selected students. The department of radiology of the hospital provides courses for the diplomas in medical radiology of the Conjoint Board. All these courses begin in October. Long-term and short-term tuition in anaesthetics is provided for a small number of students.

The Specialist Institutes

Below are very brief particulars of each of the specialist institutes, with the name of the hospitals with which they are associated.

Institute of Psychiatry (Bethlem Royal and Maudsley Hospitals, Denmark Hill, London, S.E.5).—Training normally covers two or three years after experience elsewhere in general medicine and is based on responsible hospital duties under supervision. Regular series of lectures and demonstrations given throughout university terms. Clinical training continues throughout year and includes seminars and case discussions. Students who, having had previous experience, do not wish to take comprehensive two-year course are able to attend limited series of lectures and clinical instruction. A course in technique and clinical application of electroencephalography is held jointly with Institute of Neurology two or three times a year. There are facilities for original investigations under supervision in the clinical departments and in the psychological, neuro-anatomical, electro-physiological, and biochemical departments.

Institute of Laryngology and Otology (Royal National Throat, Nose, and Ear Hospital, Gray's Inn Road, London, W.C.1, and Golden Square, London, W.1).—Comprehensive full-time course lasting eight months held twice a year, beginning February and September: first three months devoted to a study of the basic sciences of the specialty and the following five months to the clinical aspects. Part-time advanced revision course, lasting 10 or 12 weeks, suitable for students preparing for higher qualifications, held twice yearly, beginning February and August.

Institute of Ophthalmology (Judd Street, London, W.C.1; associated with the Moorfields, Westminster, and Central Eye Hospitals).—In addition to teaching by attendance on hospital practice, a routine lecture and tutorial course, normally covering two terms of approximately 18 weeks each, is held twice a year, beginning in March and October. The first part is devoted to anatomy, embryology, histology, physiology, optics, and elementary clinical instruction, and the second part to bacteriology, pathology, operative surgery, medical ophthalmology, and all aspects of ophthalmic disease. Clinical teaching and lectures are given at a higher level for advanced students. There are facilities for research for suitably qualified candidates.

Institute of Child Health (Hospital for Sick Children, Great Ormond Street, London, W.C.1; Queen Elizabeth Hospital for

Children, Hackney; and Postgraduate Medical School, Hammer-smith).—Provides tuition throughout the year in three terms of three months each, beginning in January, April, and October. In addition a series of lectures by specialists and experts in various spheres is given each term.

Institute of Obstetrics and Gynaecology (Queen Charlotte's Maternity Hospital, London, W.6; Chelsea Hospital for Women, London, S.W.3; and Department of Obstetrics and Gynaecology, Postgraduate Medical School).—Teaching based on ward work, supplemented by lectures and demonstrations during two terms of three months' duration beginning in March and September. Short intensive courses of a fortnight's duration, held in June and December each year, suitable for students preparing for higher qualifications.

Institute of Neurology (National Hospital, Queen Square, London, W.C.1, and Maida Vale Hospital for Nervous Diseases, London, W.9).—Teaching mainly by attendance on the hospital practice, supplemented by lectures and demonstrations. Two whole-time courses in clinical neurology held annually, beginning in January and October. Clinical instruction in neurosurgery given throughout the year. Courses of clinical demonstrations (two weekly) held several times a year. Advanced students appointed as clinical clerks in the wards or attached to special departments and research laboratories.

Institute of Orthopaedics (Royal National Orthopaedic Hospital, Great Portland Street, London, W.1).—Complete training in orthopaedics to selected graduates already trained in general surgery and basic sciences is offered by means of clinical appointments covering a period of two or three years, with opportunities for research. For graduates requiring a less extensive period of education in the specialty, and especially for those who have acquired practical experience overseas or elsewhere, a series of advanced courses is held each year, beginning in October, and each lasting 7 to 10 days. Twice a year, in April and September, a short revision course of a week's duration is held in advanced clinical orthopaedics. The country hospital at Stanmore, as well as the central hospital in Great Portland Street, is attended by postgraduate students.

Institute of Dental Surgery (Eastman Dental Hospital, Gray's Inn Road, London, W.C.1).—To train dental practitioners in the special branches of preventive and therapeutic dentistry. A six-months course for candidates preparing for the F.D.S. of the Royal College of Surgeons begins in January and July.

Institute of Cancer Research (Royal Cancer Hospital, London, S.W.3).—Postgraduate lectures and courses of instruction are held for students studying for the M.Sc. degree in biophysics and for the D.M.R. Facilities are afforded to those wishing to pursue research in the clinical and pathological aspects of cancer. Facilities are also available for research into the physical and biological foundations of medical radiology. There are laboratories for chemical, biochemical, and histological investigations into cancer and allied diseases.

Institute of Diseases of the Chest (Brompton Hospital, London, S.W.3, and London Chest Hospital, E.2).—Students may enrol for one term or more on an approximately half-time course, and arrangements are made for students who intend to specialize in diseases of the chest to attend a whole-time comprehensive course during the two terms, beginning in October and January. Courses consist of clinical work in wards and out-patient departments, lectures, and demonstrations. A small number of students with adequate experience can be accepted for training in thoracic surgery. Part-time instruction in radiology of the chest for trainee radiologists only is given each term.

Institute of Cardiology (National Heart Hospital, Westmoreland Street, London, W.1).—Six appointments of registrar type offered each year to physicians in training as cardiologists who already have a sound grounding in general medicine. General physicians may enrol for full-time or part-time instruction for one term of approximately three months. Three intensive courses of lectures and demonstrations, each lasting a fortnight, are held in February, June, and November.

Institute of Dermatology (St. John's Hospital for Diseases of the Skin, Lisle Street, London, W.C.2).—Throughout the year clinical teaching takes place in the out-patient department twice daily, and ward instruction is given in the in-patient unit at the Eastern Hospital. There are also facilities for study and tuition in pathology, including mycology, radiotherapy, physiotherapy, and clinical photography. A short course of lectures is given in the summer months, and a longer and more systematic course in the winter. In addition, courses of clinical demonstrations are given for candidates for higher degrees and diplomas. Discussion on cases of special interest, to which students attending the courses are invited, takes place once a week.

Institute of Urology (St. Peter's, St. Paul's, and St. Philip's Hospitals, London, W.C.2).—Comprehensive instruction is given in the wards, out-patient departments, operating theatres, laboratories, etc., throughout the year. Advanced intensive course of one to two weeks' duration held in June. Week-end courses of demonstrations and lectures held in January, April, and October for higher examination candidates. Courses of lectures and demonstrations of clinical and laboratory material are held from time to time in co-operation with members of the Medical Society for the Study of Venereal Diseases, each course of two months' duration. During these courses the practice of the venereal department is open to students. In the winter a series of lecture-discussions on urological subjects of interest to the whole profession are held. Limited numbers of clinical assistants are appointed from time to time to individual surgeons for personal tuition.

Institute of Basic Medical Sciences (Royal College of Surgeons of England).—Comprises the departments of anatomy, physiology, pathology, and pharmacology of the Royal College. The Institute co-operates with other specialist institutes of the Federation in providing facilities for practical work and instruction in the basic medical sciences. There are opportunities for research for selected graduates. Full-time or part-time courses of three months' duration, suitable for candidates for higher degrees and diplomas, begin in April and October.

At this last institute and at several of the others there are revision courses periodically.

Fellowship of Postgraduate Medicine

The Fellowship of Postgraduate Medicine (60, Portland Place, London, W.1) provides general information on postgraduate work, and arranges courses for, though not restricted to, candidates for the higher degrees. These include general medicine, general surgery, proctology, obstetrics, and children's diseases. Some are full-time courses lasting from one to two weeks; others are spread over longer periods and are intended particularly for postgraduates who are not free for full-time study. The Fellowship also arranges week-end courses, occupying the whole of a Saturday and Sunday. These are given in various hospitals and include such subjects as general surgery, general medicine, orthopaedics, rheumatic diseases, and infectious diseases.

Facilities at Oxford

Postgraduate medical education for general practitioners takes very much the same course at the United Oxford Hospitals and in the region as it has done for the past two years. Sir Robert McCarrison, the director of studies of the Postgraduate Medical Education Committee of the University, has decided to cut down the number of set courses and is anxious that such courses as are likely to take place should have the form of a "seminar" in which general practitioners attending will be asked to examine patients and thereafter discuss their findings and suggestions for treatment with the specialists and other practitioners present.

The programme of the United Oxford Hospitals for 1953-4 includes ward-rounds in medicine, surgery, gynaecology, and tuberculosis; clinical demonstrations in chest diseases, paediatrics, infectious diseases, psychiatry, geriatrics, neurology, and orthopaedic surgery; conferences in clinical pathology; antenatal and post-natal clinics; and out-patient clinics in child welfare, venereal and skin diseases, and plastic surgery. All these demonstrations are open to general practitioners, who may attend on occasions convenient to themselves, whether these be spread over the academic year or concentrated into periods of a week or more. Short courses or conferences on special subjects are arranged for general practitioners if there is sufficient demand for them. The address of the Postgraduate Medical Education Committee is 11, Keble Road, Oxford.

Postgraduate Facilities at Cambridge

The School of Postgraduate Teaching and Research at Cambridge comprises the departments of medicine, experimental medicine, radiotherapeutics, and human ecology. In

the John Bennett Clinical Laboratories pathological and biochemical services of the United Cambridge Hospitals are provided by university teaching officers under the direction of the professors of pathology and biochemistry. New accommodation for the medical school administrative headquarters and the department of medicine has been provided during the year on a site in the grounds of Addenbrooke's Hospital. The new premises include a haematological laboratory, a chemical laboratory, consulting- and examination-rooms, accommodation for the regius professor of physics, the lecturer in medicine, the research chemist and research students, and administrative offices for the medical school. The transfer to new premises brings together under one roof for the first time the medical, administrative, research, and technical staffs of the Department of Medicine and the Medical School.

Between October and July in each academic year special sessions are devoted to teaching by all members of the consultant staff of the United Cambridge Hospitals. A small number of undergraduate students are admitted to these teaching sessions. Other teaching activities include a clinico-pathological conference held on the third Wednesday of each month which affords an opportunity for general practitioners and others to meet the staffs of the teaching hospital and of the various departments of the medical school. One-day symposia on subjects of particular interest to general practitioners are held monthly on Saturdays throughout the academic year. These symposia usually take the form of lecture-discussions followed by case demonstrations. Residential courses in midwifery are available for undergraduate and postgraduate students at the maternity hospital.

All postgraduate courses and symposia are open, without fee, under a scheme of the Ministry of Health, to practitioners who are under contract with an executive council of the National Health Service, and who have not less than 500 (or in the case of a rural practice 250) persons on their N.H.S. lists. It is no longer necessary for a practitioner to submit an application for approval to the Ministry of Health before attending these symposia unless he wishes to claim for the employment of a locum tenens. A practitioner who does not qualify for a grant under the Ministry of Health postgraduate scheme is charged a fee at a rate corresponding to that which would otherwise have been payable by the Ministry. The director of postgraduate education for the Cambridge region is the regius professor of physics, Sir Lionel Whitby. Practitioners desiring further details of postgraduate facilities should apply to the secretary of the Medical School, Tennis Court Road, Cambridge.

Postgraduate Facilities in Edinburgh

The Edinburgh Postgraduate Board for Medicine (Surgeons' Hall, Edinburgh, 8) organizes courses in internal medicine and medical sciences as well as short refresher courses for general practitioners. The Royal College of Surgeons of Edinburgh is holding under the aegis of the Board two 10-weeks courses in the medical sciences, one starting on October 5, 1953, and the other on January 4, 1954. The fee is 25 guineas. The next 12-weeks course in the medical sciences organized by the Board will begin in July, 1954, and the fee will be 30 guineas. The next fortnight refresher course for general practitioners will probably be held during the first part of May, 1954, but so far no definite arrangements have been made regarding this.

The University of Edinburgh does not offer courses in preparation for the higher degrees in medicine and surgery, but courses for the diplomas in public health, tropical medicine and hygiene, radiodiagnosis, radiotherapy, and psychiatry are given. An intensive course for the diploma in psychiatry, lasting five weeks, will begin in October, 1953, for the examinations in December, 1953, and April, 1954. While this course is primarily intended for those registered as candidates for the diploma of the University, it is open to others who may be interested to apply for permission to

attend. The courses for the diplomas in medical radio diagnosis and radiotherapy now occupy a full-time period of two years' study. The University offers a three-year course leading to a certificate in medical illustration.

Postgraduate Courses in Other Universities

At Sheffield the University's own postgraduate committee continues to give attention to appropriate matters domestic to the locality, and a Regional Postgraduate Medical Committee, centring upon the University, has been set up to deal with the region as a whole. The question of interchange of senior registrars between teaching and non-teaching hospitals is one of those under active consideration. Weekly ward-rounds for general practitioners are held at the United Sheffield Hospitals and the City General Hospital. No diplomas in radiology are awarded by this university but courses are available in preparation for the D.M.R.C. and D.M.R.T. of the Conjoint Board. Numbers have recently been insufficient to justify the organization of definite courses in preparation for the M.R.C.P. or F.R.C.S., but suitable instruction may be provided, by arrangement, for approved candidates.

At Leeds postgraduate education for general practitioners takes the form of week-end courses, some four of which are given each year. This year it is hoped to organize a series of extended refresher courses not only in Leeds but in other large medical centres in the region. These will comprise one half-day session a week for six weeks in both the teaching and major regional hospitals.

At Liverpool similar arrangements are proposed for next session with regard to postgraduate courses. Last session the number of students attending the courses was as follows: general surgery (14), orthopaedic surgery (13), anaesthesia (15), public health (9), radio-diagnosis (12), radiotherapy (3), and tropical medicine and hygiene (33). Three short refresher courses for general practitioners were also held, each consisting of four weekly sessions. The first, on obstetrics and gynaecology in general practice, was attended by 58 practitioners; the second, on recent advances in general medicine, by 55; and the third, which was on two subjects, children's diseases and therapeutics, was attended by 42 practitioners.

A postgraduate course for general practitioners was held in the Medical School of the University of Durham and the associated hospitals during April and May. It consisted of eight consecutive weekly half-day sessions in various subjects, and was so arranged as to bring forward the latest developments in each. The demand for admission to the course was great, and many applicants had to be refused; the number attending was limited to 25.

Highly successful courses for general practitioners have been arranged for Sunday mornings by the Medical Faculty of the University of Bristol. At Manchester refresher courses for general practitioners have been held in obstetrics and medicine, also an intensive course in industrial health. Postgraduate study facilities have been provided at Manchester for a number of students from overseas. In the Welsh National School of Medicine at Cardiff postgraduate instruction for practitioners is given regularly in certain departments, and postgraduate courses in tuberculosis attract large numbers.

In Glasgow the Postgraduate Medical Education Committee, representing the University and the Royal Faculty of Physicians and Surgeons, proposes to offer during the coming session an eight-weeks part-time course of instruction in anatomy, physiology, biochemistry, pathology, and bacteriology. The course—a total of about 160 hours of instruction—is suitable for candidates preparing for the primary examinations for the surgical fellowships. It is organized chiefly for the junior staff of hospitals in the Western Region, but it is also open to other applicants. If desired, an honorary part-time clinical attachment will be arranged for members of the course who have no hospital appointment. Short courses in other specialties are arranged from time to time, including in the coming session a short

course in chemotherapy and a course in mental deficiency. Refresher courses for general practitioners are held, consisting largely of clinical demonstrations, but including a few lectures on modern methods of therapy. The director of postgraduate medical education is Professor G. M. Wishart, whose address is the University, Glasgow, W.2.

The Queen's University of Belfast holds a two-weeks refresher course in September of each year for general practitioners. Postgraduate instruction is also given at the recognized teaching hospitals for graduates who are proceeding to higher degrees.

Beginning in October, 1953, the Royal College of Surgeons in Ireland will give a four-months course in anatomy, physiology, and pathology in preparation for the Primary Fellowship examinations. There will be two courses in each year, one starting in October for the February examination and the other in March for the July examination. These courses will be full-time, and it is hoped to make them fully comprehensive. Details of the courses are printed with the regulations, and copies may be had from the Registrar of the College, St. Stephen's Green, Dublin.

MEDICAL PSYCHOLOGY

The Tavistock Clinic (2-4, Beaumont Street, London, W.1) is an out-patient clinic comprising two departments—the adult department for the treatment of patients with neurotic and personality disorders, and the department for children and parents in which difficulties in parent-child relationships and in the personality development of children are treated. A number of senior registrar and registrar appointments in both departments provide systematic training in adult psychotherapy and child psychiatry. The Clinic also offers a two-year extramural course for psychiatric registrars and consultants in the principles of psychotherapy and psychopathology, with special reference to group treatment (adults). There are courses also for general practitioners: an introductory weekly discussion group on principles of psychological medicine and the doctor-patient relationship applied to their own work, and a more advanced course, including case supervision, for those wishing to gain more experience in the treatment of neurotic and psychosomatic disorders in their own practice. In addition there is elementary and advanced training in the Rorschach method of personality diagnosis (open to psychiatrists), as well as general courses of training for clinical and educational psychologists, child psychotherapists, social workers, and speech therapists. The Clinic welcomes visitors, and has facilities for offering Associate status to interested overseas psychiatrists, psychologists, and social workers who are in Great Britain for further training. Full particulars may be obtained from the Training Secretary at the address given above.

The National Association for Mental Health (39, Queen Anne Street, London, W.1) arranges training courses in child psychiatry. Fellowships are given to enable qualified psychiatrists to obtain special training in child guidance at a recognized training clinic, and these are tenable at a number of clinics in Great Britain. The association also runs a number of other courses, especially for those whose work is among the subnormal and the mentally defective.

The Institute of Psycho-Analysis (63, New Cavendish Street, London, W.1) furnishes a part-time course, lasting about four years, in psycho-analytic theory and technique. It includes a personal analysis, attendance at lectures and seminars, and clinical work under supervision. The Institute does not set out to teach all aspects of psychiatry, and general psychiatric experience must be obtained at other clinics and hospitals.

The training given at the Institute of Psychiatry, associated with Bethlem Royal and Maudsley Hospitals, is referred to in the account of postgraduate facilities in London, given on page 499.

Courses in psychiatry are given at various universities.

RESEARCH CAREERS

Some practitioners forsake the prospect of clinical medicine for a career in the scientific aspects of practice or in medical research work. The first step in such a career is usually a junior post in the laboratory service of a teaching hospital or in one of the centres of the Public Health Laboratory Service (see below). The salaries offered are often at the registrar level, providing for promotion from junior registrar to senior registrar; or appointment and remuneration may be in the hands of a university with salaries in the demonstrator and lecturer classes. A career may also be entered upon at an earlier phase by the relatively few students who in their pre-qualification period have shown an aptitude for research and who may enter the service of the Medical Research Council or obtain a scholarship or grant. The biggest outlets are clinical pathology and university appointments associated with teaching and research. For all of these there is no finer training than that arising from the handling of the immense volume of routine pathological work that passes through the laboratories of any large hospital. Aptitude for research is often manifested or confirmed during this period of training and may determine the future career by differentiating between an academic life in the employment of the Medical Research Council and a practical career devoted perhaps to clinical pathology in a local hospital. Aptitude for teaching is also revealed during this period and may determine a future career in the university sphere, culminating in a readership or professorship. Applications should be addressed to individual universities, corporations, or other bodies advertising vacancies.

The Medical Research Council

The Medical Research Council, established 40 years ago as the Medical Research Committee, is appointed to administer the funds provided annually by Parliament for the promotion of research in medical science. The members are appointed by the Committee of the Privy Council for Medical Research. The Council is not constitutionally a Government department; it selects and appoints its own staff, who are not Civil Servants. Its sphere of action in promoting medical research is unrestricted by territorial or departmental limitations of function. It maintains close touch with Government departments having responsibilities for public health, and collaborates freely in subjects of common interest with its sister research organizations—the Department of Scientific and Industrial Research and the Agricultural Research Council—and with cognate organizations in other countries.

Some 18 of the 50 research establishments of the Council are concerned with clinical problems, and the Council's activities in promoting clinical research are soon to be greatly extended through the medium of a clinical research board to be set up as part of the recently published arrangements for encouraging clinical research in the National Health Service. The Council's central research establishment, the National Institute for Medical Research, has separate divisions of biochemistry, chemotherapy, bacterial chemistry, physiology and pharmacology, human physiology, experimental biology, bacteriology and virus research, physical chemistry, biophysics and optics, and biological standards. The interests of the Council's other research units range from fundamental laboratory subjects, such as biophysics, chemical microbiology, and radiobiology, to various aspects of social and industrial medicine.

The close association of most of the Council's establishments with hospitals and universities is valuable from many points of view, especially in the opportunity it provides for collaboration in joint schemes of research. Senior members of the Council's staff are often given the status of honorary physicians of the hospitals in which their units are situated, while members of units accommodated in university depart-

ments are in many cases given honorary university appointments and participate to a limited extent in teaching.

The Council's total scientific staff numbers just over 450, of whom about one-third are medically qualified. The average research unit consists of from 5 to 10 scientific workers with a number of technical and clerical assistants. They are located mainly in hospitals and universities. Plans for expanding clinical research in the National Health Service have recently been published (see *British Medical Journal*, July 18, p. 140).

Emoluments

The aim of the Medical Research Council is to provide the opportunity for careers which are equivalent to those offered in the universities to men and women of equal ability and experience. The Council's salary scales for scientific appointments are based on this principle; although there is no common scale for all the universities in the United Kingdom, the Council's salary grades correspond approximately with the ranks of professor, reader, senior lecturer, lecturer, and demonstrator. Thus the emoluments of the director of one of the Council's clinical units are equivalent to those of a whole-time professor of medicine with an honorary contract as a consultant in the National Health Service. The salary of a non-clinical director would normally be equivalent to that of a major non-clinical or purely scientific chair. Apart from the directors, there are other posts in the Council's larger establishments, and particularly at the National Institute for Medical Research, which carry remuneration at or near the professorial level.

For the most part, salaries are not fixed in relation to particular posts but rather with reference to the qualifications, experience, and responsibilities of the individuals. Promotion to a higher grade may be awarded on such grounds without change of post.

New appointments to the scientific staff, except in the cases of senior posts, are normally made for definite periods, usually of three or five years at a time. At a later stage, when an adequate degree of seniority has been attained, the Council may, in suitable cases, express the intention of continuing employment until the normal retiring age of 60 has been reached, with the possibility of extension to 65.

Superannuation provision—normally under the federated superannuation scheme for universities, but in certain cases under the National Health Superannuation Scheme—is made in respect of appointments except those of recent B.A., B.Sc., and M.A. graduates, who may have to wait a year. In addition to maintaining its own staff the Council makes very large numbers of short-term grants in support of specific research projects carried out by independent research workers in universities, hospitals, and elsewhere. The Council also awards clinical research fellowships, scholarships for training in research methods, and certain travelling fellowships. These last are awarded either on an agency basis for other bodies or from private benefactions entrusted to the Council.

Public Health Laboratory Service

On behalf of the Ministry of Health the Medical Research Council administers the Public Health Laboratory Service, which was originally set up as an emergency service in 1939, and has since become permanent; there are over 50 separate laboratories in England and Wales. In addition to their more routine duties members of the staff of the Service, whose salary scales are normally equated with those of the National Health Service, undertake research problems on bacteriology and epidemiology. Furthermore, the Service maintains a number of special laboratories which act as reference centres for particular infections, and these engage largely in research.

A booklet giving details of the opportunities for appointment to the scientific staff of the Council, and of the awards of grants, fellowships, and scholarships, may be obtained from the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1.

Other research institutions in London are the Asthma Research Council (King's College, Strand, W.C.2); the Chester Beatty Research Institute (Royal Cancer Hospital, Fulham Road, S.W.3); the Empire Rheumatism Council (Tavistock House North, Tavistock Square, W.C.1); the Lister Institute of Preventive Medicine (Chelsea Bridge Road, S.W.1); and the Wellcome Research Institution (183-193, Euston Road, W.C.1).

MEDICAL AUXILIARIES

The Board of Registration of Medical Auxiliaries (B.M.A. House, Tavistock Square, London, W.C.1) was set up many years ago, principally at the instance of the British Medical Association. The desirability of having a national register of trained persons engaging in technical work or practice ancillary to that of the medical profession was obvious. The register includes radiographers, dispensing opticians, chiropodists, speech therapists, orthoptists, dietitians, physiotherapists, and biophysical assistants. The Board is a registering and disciplinary, but not an examining, body; examining bodies in the various branches are approved by the Board and appoint representatives to its council. The Board's function is to co-ordinate the work of the various auxiliaries, to ensure that they are qualified, to maintain and improve their standard of training, and to effect liaison between them and medical practitioners.

All the many thousands of persons whose names appear on the register hold a qualification in their branch which is recognized and approved by the Board. With the exception of the chiropodists, all those on the register undertake not to carry out any medical auxiliary work except under the direction and control of a medical practitioner. The chiropodists confine their practice to the treatment of malformed nails, superficial excrescences, and the like.

The qualifying bodies for the respective branches are the Society of Radiographers, the Association of Dispensing Opticians, the Society of Chiropodists, the College of Speech Therapists, the British Orthoptic Society, and the British Dietetic Association. Established periods of training are imposed. Radiographers and chiropodists, for example, have two years' training, and speech therapists a three-years whole-time course, all of it at recognized centres.

The Chartered Society of Physiotherapy (Tavistock House North, Tavistock Square, London, W.C.1) maintains its own national register, and approves schools for training and examinations.

THE ARMED FORCES

The conditions of service in the medical branches of the armed Forces have recently been under active discussion and the decision was not available at the time the information for this Educational Number had to be prepared.

Royal Army Medical Corps

Entry into the Royal Army Medical Corps is in the first instance by means of a short-service commission, and subsequently, for male officers, by selection to a regular commission on completion of six months' combined national service and short service. The appointment to a short-service commission is in the rank of lieutenant, with promotion to captain on completion of one year's service. All previous follow-up service as a medical officer counts for promotion. Candidates must ordinarily be under the age of 45. The period of short-service commissions is eight years, of which any period from two years upwards may be spent on the active list, and the remainder on the Regular Army Reserve.

Short-service male officers on completion of six months' total service as medical officers may apply for a regular commission. The active-list period of the short-service commission and other service will count towards ultimate retired

pay or service gratuity on appointment to a regular commission, but such officers are not entitled to any short-service gratuity. Further details may be obtained from the Under-Secretary, War Office, and a personal interview with a representative of the Director-General, A.M.S., is available at Lansdowne House, Berkeley Square, London, W.1.

Professional Training of Army Officers

Medical officers commissioned in the R.A.M.C. receive postgraduate training at the Royal Army Medical College, Millbank, London, S.W.1. The College has a director of studies and tutorial staff for the teaching of Army health, pathology, tropical medicine and entomology, military surgery, Army psychiatry, radiology, dermatology, and venereology. Regular R.A.M.C. officers between their eighth and tenth years of service pass through the senior officers' postgraduate course of professional studies. Those who satisfy the College council that they are suitable may proceed to individual specialist training for one year, undertaken in general in selected teaching schools or hospitals.

The department of Army health at the College provides facilities for special study in the maintenance and enhancement of the health of the Army. Officers intending to specialize in Army health are given the opportunity of taking the D.P.H. during their specialized course, and are assisted in obtaining their D.T.M.&H. The department of pathology provides lectures, demonstrations, and practical classes covering laboratory diagnosis and pathological aspects of general, tropical, and preventive medicine and military surgery. The syllabus of the department of military surgery covers both general and regional surgery and includes the surgery of tropical diseases and the management of surgical conditions peculiar to service both at home and abroad.

Naval Medical Service

Entry into the Naval Medical Service as acting surgeon-lieutenant is, in the first instance, on a short-service basis for four years, with a gratuity on leaving the Service. Short-service officers who wish to make the Naval Medical Service their permanent career may apply for transfer to the permanent list. Courses for postgraduate study are arranged not only at naval hospitals but at the more important centres of postgraduate instruction.

The rank of acting surgeon-lieutenant is borne for one year and thereupon the rank of surgeon-lieutenant is conferred on the officer with such additional seniority, up to a maximum of two years, as can be awarded to him in respect of house appointments and comparable medical experience before entry. Promotion to surgeon lieutenant-commander is granted after eight years' continued service, and further promotion is by selection.

Further information may be obtained from the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W.1.

Medical Branch of the Royal Air Force

Medical officers in the Royal Air Force serve at three main types of station—flying, training, and maintenance—and also at hospitals and other medical units. The station medical officer is responsible for the medical care of the station and supervises hygiene and sanitation. He also undertakes the medical indoctrination of the air crews, further training of medical staff, and the general medical administration. Service families may elect to go on his list as N.H.S. patients. Service hospitals provide a full range of facilities for both in-patient and out-patient diagnosis and treatment. There are rehabilitation units and specialized medical units such as the R.A.F. Institutes of Pathology and of Aviation Medicine.

Further information can be obtained from the Director-General of Medical Services, Air Ministry, Kingsway, London, W.C.2.

TO SAFEGUARD THE PRACTITIONER

The young practitioner immediately on registration should join one or other of the defence and protection organizations mentioned below. This duty is more than ever incumbent upon him in view of the increased litigiousness of the public since the coming of the National Health Service. The caution applies not only to the general practitioner but to the member of a hospital staff, seeing that hospital-employing authorities do not undertake the defence of any member of a hospital medical staff against whom a legal action may be brought, as, for instance, for alleged negligence. However careful a practitioner may be, he is never immune from the chance or accident which may involve him in litigation or the threat of it, and a single successful action against him may ruin him financially; even an unsuccessful action may cause him heavy expense, anxiety, and perhaps some loss of reputation.

The Medical Defence Union (Tavistock House South, Tavistock Square, London, W.C.1) has a membership of 38,750. Membership is open to medical and dental practitioners, and there is special provision for the protection of overseas practitioners practising in any part of the world, with the exception of America. The work of the Union has been increasing by leaps and bounds during the past three years. It provides advice and financial indemnity for any member threatened with or involved in litigation raising a question of professional significance or, more commonly, based upon a charge of professional negligence. The accumulated funds are £112,155, and the subscription income is mounting annually, though costs of litigation and settlements out of court are increasing at an even more rapid rate. Since its foundation the Union has spent just upon half a million on damages and costs incurred in protecting members.

The Medical Protection Society (Victory House, Leicester Square, London, W.C.2) has a membership of over 28,000. Membership is open to registered medical and dental practitioners, including those practitioners who are provisionally registered under the Medical Act, 1950. There are special provisions for members practising overseas and also for practitioners who visit the United Kingdom for postgraduate work. Members are afforded advice and assistance in all matters of professional difficulty, with unlimited indemnity against legal expenses incurred in defending and conducting cases on their behalf, and also against costs and damages in those cases in which adverse verdicts result. This indemnity is secured by financial resources exceeding £150,000 and a reinsurance with Lloyd's underwriters. From year to year the work of the Society increases steadily and larger amounts of costs and damages are paid on behalf of members.

The Medical and Dental Defence Union of Scotland (113, St. Vincent Street, Glasgow, C.2) has a membership of 7,300 throughout Scotland, England, and Northern Ireland. The total assets amount to just upon £40,000. The policy of the Council has always been to give careful consideration to the interests of its members who have claims made against them for negligence and to advise when requested regarding any business, legal, and professional matters arising from their practice.

Advice on Insurance

The Medical Insurance Agency (B.M.A. House, Tavistock Square, London, W.C.1) is not an insurance company, but it is a recognized agent of all the leading insurance offices, and is thus able to obtain for members of the medical profession the best terms available in the insurance market at any given time. The Agency, which is conducted on a non-profit basis, advises on all forms of insurance—personal, household, and practice—and a special pension and insurance plan has been arranged with a panel of leading British offices to provide benefits of a special character to supplement National Health Service superannuation schemes. Special terms exist for the purchase of houses, equipment, and motor-cars.

DIPLOMAS IN PUBLIC HEALTH AND TROPICAL MEDICINE

Most of the universities offer a full-time course in public health, lasting for nine months and beginning in October. In Durham there is a part-time course both for the Certificate and for the Diploma in Public Health, which is proving very successful and appears to be more popular than the whole-time course. Nine practitioners registered for the C.P.H. last October and eight of these passed the examination held in March. The D.P.H. course at Durham began in April and will continue until March, 1954, when the examination for the diploma will take place. The necessary instruction is organized by the Department of Public Health, which is closely associated with the child health, industrial health, bacteriology, and other departments of King's College, Newcastle-upon-Tyne, for the purpose of providing specialized teaching in the various subjects covered by the syllabus. The next complete course for the certificate and diploma begins in October, 1954. At Leeds the D.P.H. continues to be a part-time course of five terms, and it is hoped that a new course will begin in October of this year. From the Welsh National School of Medicine it is stated that inquiries about the C.P.H. and D.P.H. courses have fallen to a low level. The Royal Army Medical College, Millbank, London, is a recognized teaching institute for the D.P.H. and D.T.H.

London School of Hygiene and Tropical Medicine

The work of this school is organized in ten main departments—namely, applied physiology, bacteriology and immunology, biochemistry, clinical tropical medicine, entomology, human nutrition, medical statistics and epidemiology, parasitology, public health, and the Ross Institute of Tropical Hygiene. The course for the University of London's postgraduate certificate and Diploma in Public Health, designed primarily for medical practitioners who intend to enter the public health service in Great Britain, begins in October each year and lasts for nine months. The examination for the certificate is held at the end of the first three months. In addition to the subjects covered by the D.P.H. syllabus the students are entitled to choose for special study one of the following subjects: industrial health, tropical hygiene, institutional administration, medical statistics and epidemiology, and local government. The industrial health lectures and practical work are recognized both by the Conjoint Board and by the Society of Apothecaries as fulfilling in part the requirements for entry to the Diploma in Industrial Health examination. Students who intend to enter for this examination, however, are required to make their own arrangements for attending clinics in accident surgery, dermatology, and ophthalmology. There are no vacancies for the D.P.H. course beginning this autumn.

The course for the University of London postgraduate Diploma in Bacteriology provides advanced instruction for graduates in medicine who intend to follow a career in bacteriology. The course begins in October and lasts for nine months. The course for the Conjoint Board's Diploma in Tropical Medicine and Hygiene is a continuous one of five months' duration and is open to qualified medical practitioners. It is held twice a year, commencing at about the beginning of October and the beginning of March.

The course for the University of London's postgraduate C. and D.T.M.&H. starts at about the beginning of October each year. Both the preliminary and the final courses extend over a period of not less than four months' study. Candidates for the final part of the course, who must have had at least 12 months' experience of medical practice in a tropical country, are required to specialize in one of the following elective subjects: clinical tropical medicine, medical biology in relation to tropical medicine, and tropical hygiene.

During the last year at the school 496 students from 33 different countries were admitted to the various courses, and 22 degrees and 201 diplomas were obtained.

In the department of public health the curriculum for the D.P.H. has been entirely changed since the second world war. There is now a preliminary course of one term, taking the form of a general introduction to the scope and character of the public health and social services, and in the final course, which occupies two terms, the main purpose is to develop the student's knowledge of the public health services to-day and to bring him closely into touch with the practical problems of public health administration. Much of the work during these six months is in the form of practical instruction or else entails independent study by the student. Practical work under the direct supervision of medical officers of health is a constant feature of the final course.

Liverpool School of Tropical Medicine

At the Liverpool School of Tropical Medicine (Pembroke Place, Liverpool, 3) men and women students of any nationality who hold a medical qualification approved by the university are admitted to examination for the D.T.M.&H. Other students are also admitted to special courses in parasitology and entomology. The examination for this diploma is held twice yearly, in December and in April. The fee for admission to the examination is £6 6s., and for each subsequent examination, £5 5s., and the fee for the diploma £3 3s. The fees for the courses of instruction are £42 for the D.T.M.&H. course and £21 for the revision course. Each of the two courses for this diploma has been reduced from five months to three months. The school also gives courses of instruction in public health, parasitology, and entomology for students taking the D.P.H., and courses of instruction in veterinary parasitology and entomology for students taking the M.R.C.V.S. diploma and the B.V.Sc. degree.

Edinburgh University has courses for the D.T.M.&H., lasting two terms, beginning in October. Diplomas in industrial health are granted by a number of bodies, including the Royal Faculty of Glasgow and the Scottish Conjoint Board, and full-time postgraduate courses are arranged at certain universities.

Royal Institute of Public Health and Hygiene

The Royal Institute of Public Health and Hygiene furnishes courses of instruction for the C.P.H., beginning in March and October, and for the D.P.H., beginning in January and August. It also furnishes courses for the Diploma in Industrial Health (the course for Part I of which is the same as, and runs concurrently with, the course for the C.P.H.). For the C.P.H., lectures are given by specialists on the various sociological aspects, and in the D.P.H. the practical work is carried out at a county borough. The D.I.H. course entails visits to all types of factories and to coal-mines.

PROFESSIONAL SOCIETIES

British Medical Association

The British Medical Association (Tavistock Square, London, W.C.1) was founded in 1832 to promote the medical and allied sciences and to maintain the honour and interests of the medical profession. Its membership is about 67,000, and it covers 85% or more of the working profession of the country. It is recognized by the Government, local authorities, and other organizations as the representative body of the profession. Members are elected by the Council of the Branch for the area in which they reside, or, if they are serving with the Forces or for other reasons are non-resident in a Branch area, they are elected by the Central Council. Newly qualified practitioners are admitted to membership at a lower subscription until the end of their fourth year after registration. The Association has important Branches in Australia and New Zealand and flourishing local units in many parts of the British Commonwealth. The Medical Associations of Canada and South Africa are affiliated to the B.M.A.

The policy of the Association is determined by the Representative Body, which is composed of representatives from all the Divisions. A Constitution Committee is about to be set up to consider and report on the reorganization of the Representative Body, which, with the growth of the Association, has become somewhat unwieldy in size. The Council is the Association's executive; its method of election has been recently revised to ensure as equal a representation of the regions as possible, as well as to afford opportunity for the election of a certain number of members on a national basis, and to include representation of the medical branches of the fighting Services, the public health service, and the Overseas Branches.

The principal work of the Association is carried out through a large number of standing and special committees. The Central Consultants and Specialists Committee (which also has a regional organization) acts with the Royal Colleges on all matters arising under the National Health Service Acts affecting consultants and specialists. The General Medical Services Committee acts as the executive of the Conference of representatives of Local Medical Committees in all questions affecting practitioners rendering general medical service under the Acts and is the recognized mouthpiece of the profession in this field. The Public Health Committee, which has a working agreement with the Society of Medical Officers of Health, deals with all matters relating to the public health service. Other committees of the Association are concerned with private practice, ethical questions, and the encouragement of medical science and research, and there are joint committees with other bodies, for the consideration of matters of mutual interest.

The privileges of members of the Association include participation in all its activities, central and local; the weekly receipt of the *British Medical Journal* and its *Supplement*; the use of the Association's house and library at Tavistock Square, London, and elsewhere in Great Britain, and in certain Overseas Branches; and the help of a highly skilled and experienced staff at Headquarters in the many difficulties and problems which arise in practice.

In addition to the *British Medical Journal* the Association publishes a number of specialist journals and abstracts. The library of the Association contains 65,000 volumes, and 1,600 periodicals are received regularly. The library has a large lending and circulating service and is available for reading and reference purposes to members calling at the Association House.

Medical Practices Advisory Bureau

In 1948 the Council of the Association set up a Medical Practices Advisory Bureau, which is functioning at Headquarters under the direction of a member of the medical secretariat. It acts as a central source of information concerning openings in the various fields of medical practice; introduces partners, assistants, and locum tenents; and advises on all individual and personal problems associated with entry into and carrying on of the profession. The facilities of the Bureau are available to any doctor and are free of charge to members of the Association. Inquiries should be addressed to the medical director of the Bureau either at the head office of the Association in London or at the branch offices, 33, Cross Street, Manchester, 2, or 7, Drumsheugh Gardens, Edinburgh.

Empire Medical Advisory Bureau

The Council has set up at Headquarters at Tavistock Square two organizations, one for welcoming and providing a personal advisory service for practitioners visiting this country from the Dominions and Colonies, and the other for performing a similar function for practitioners from countries outside the Commonwealth.

The Empire Medical Advisory Bureau invites all medical visitors from Commonwealth countries to get in touch with it, if possible before arrival, and to call at the Bureau as soon as possible after arrival and talk over with the medical

director (Dr. H. A. Sandiford) any points on which they may need advice or assistance. Last year 788 visitors were interviewed personally by the director, and many hundreds of others were seen by his staff. Altogether over 2,000 visits were paid to the Bureau by old and new visitors during the year. Personal contact is maintained with medical schools, postgraduate institutions, hospitals, and other bodies able to assist overseas visitors in the educational field. A register of suitable hotels and lodgings is maintained by the Bureau, and general information is afforded concerning travel, customs duties, facilities for sport, exhibitions, and the like.

The other organization is the International Medical Visitors Bureau, also located at B.M.A. House, under the directorship of Dr. Sandiford. Here again information is obtainable on postgraduate education, visits to hospitals and clinics are arranged, and assistance is given to visitors in finding accommodation and in many other respects.

Society of Medical Officers of Health

The Society of Medical Officers of Health (Tavistock House South, Tavistock Square, London, W.C.1) is a society of medical officers engaged in public health work in all its branches. It publishes an official organ entitled *Public Health*. There is reciprocal representation on the Association's Public Health Committee and the Society's Council, and the Public Health Committee acts in conformity with an agreement with the Society of Medical Officers of Health under which medical-political activities in this field are undertaken by the Association.

Medical Women's Federation

The Medical Women's Federation (Tavistock House North, Tavistock Square, London, W.C.1) works closely with the Association, and is represented as such by the one woman member on the General Medical Services Committee. The Federation is the only professional organization consisting solely of medical women, and is thus in a position to represent the interests of women doctors and to deal with problems affecting them as a minority in the profession. It also considers and investigates medical matters of special concern to women doctors. The Federation has active local associations all over the kingdom, including a large London association, and an association of its Overseas members. These associations meet regularly, and the *Journal* of the Federation is published quarterly for private circulation among its members.

In addition to the bodies above named there are, of course, the many societies devoted to medical science, headed in London by the Royal Society of Medicine and the Medical Society of London, whose province it is, mainly by papers and discussions and publication, to advance the science and art of medicine generally in one or other of its specialties; there are the medical benevolent societies (the Royal Medical Benevolent Fund, Epsom College, and the Sir Charles Hastings Fund and the Dain Fund of the British Medical Association), and the defence and protection societies, which are the subject of a separate article (page 504).

The third edition of the "British Code of Standards in Relation to the Advertising of Medicines and Treatments" has now been published. The Code has the approval and support of the Newspaper Proprietors' Association, the Newspaper Society, the Advertising Association, the Institute of Incorporated Practitioners in Advertising, and other organizations. The introduction to the Code of Standards urges that newspapers and other advertising media should not accept advertisements for any product or treatment from any advertiser or advertising agent who disregards the provisions of the Code in any form of advertising or publicity relating to that product or treatment. The Code lays down general principles relating to advertisements for medicines and treatments, describes the restrictions imposed by statute, and gives a list of sixty diseases, illnesses, or conditions for which medicines or appliances should not be advertised.

MR. W. D. HARMER, 80

St. Bartholomew's men in particular, laryngologists in general, a host of former students who sat under a most inspiring and encouraging teacher, as well as a large company of grateful patients and friends, will join in good wishes to Mr. William Douglas Harmer on the attainment of his 80th birthday on August 25.

In the closing years of the last century Mr. Harmer left his native Norfolk (where the records of his family go back



to the reign of Henry IV, but without previously a doctor among them), by way of Uppingham School and King's College, Cambridge, to make his name at St. Bartholomew's in London, in which hospital his career has been largely spent, and on the staff of which he is now the senior surgical consultant. It was in general surgery that he first made his mark. In 1901 he took the M.C.(Cantab)—changed in late years to M.Ch.—and contributed his first articles to his hospital journal on general surgical subjects. In due course he was elected assistant surgeon at Bart's and became warden of the Medical College. He succeeded Sir D'Arcy Power as surgeon in charge of the throat department, and was in fact the virtual founder of that department as a separate entity. The first paper he wrote in his special field of surgery appeared in 1907; it was on a subject to which he often returned in his writings—malignant disease of the larynx. The article was followed by many other contributions, some of them describing original forms of treatment. His great experience in this sphere was summed up many years later in his Semon Lecture in the University of London, when he took as his theme the treatment of malignant disease of the upper respiratory and alimentary tracts. His name appears in various textbooks and journals as the author of articles on the surgery of the nose and throat, notably in Carson's *Modern Operative Surgery*. With Dr. N. S. Finzi, the well-known radiologist, he devised a technique of interstitial radiotherapy which is still in use and is known as the Harmer-Finzi operation. The two also founded one of the first consultative clinics to combine surgery and radiotherapy in the treatment of malignant disease—an example followed by other departments at St. Bartholomew's and elsewhere.

A lion-hearted surgeon, Mr. Harmer has been a most inspiring teacher, and the young men he has trained have remained devoted to him. Many of them have served on the staffs of London and provincial hospitals. After his relatively early retirement from active work at Bart's (in order to allow a colleague to be head of the department for a time, since otherwise they would have had to retire together) he continued to serve as surgeon to the Mount Vernon Hospital, and he is still in consulting practice in Portland Place. After the death of his brother in 1932 he was called upon to assume the chairmanship of the family business in Norwich, and he gave that new responsibility close attention until quite recently.

Douglas Harmer has been an active participant in many forms of sport—a good shot, an excellent fisherman, a three-handicap golfer (with wooden clubs of his own making), proficient on the ice (in his youth he skated from Cambridge to Peterborough—an achievement which, it is said, subsequent winters have not permitted anyone to repeat), and an enthusiastic skier, who in 1909—when Davos had scarcely been heard of—went on a long ski-ing expedition in the wild mountains of Montenegro, where the "madness" of the Englishman was suspected as a cover for subversive activities. He is now a keen gardener at his home at Littlestone-on-Sea in Kent, where he can sometimes be seen grafting apple trees in a March gale. Mrs. Douglas Harmer, whom he married 47 years ago, has for many years taken a prominent part in the work of the Ladies' Guild of the Royal Medical Benevolent Fund. One of their three sons, Mr. Michael Harmer, is a surgeon in London.

Over two thousand years ago the Roman writer Varro, who himself lived to 88, said that his 80th birthday warned him to pack his baggage. But Mr. Harmer's baggage is still well spread about and in full employment, and we trust that it will be long before he considers the time has come to begin putting his things together.

Correspondence

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

Bornholm Disease

SIR,—Dr. Gilbert Dalldorf (*Journal*, August 1, p. 287) asks if there is any information available in Great Britain of concurrence or competition of poliomyelitis and Bornholm disease. I have been interested in these diseases for some years, and the following information may be of value.

It is difficult to give an entirely accurate indication of the incidence of the two diseases, because in hospital practice one tends to see all the poliomyelitis and little of the Bornholm, whereas in general practice it is difficult to see the overall picture in a sufficiently wide area and in a sufficiently large number of patients. At the Harborough Road Infectious Diseases Hospital, Northampton, from 1949 to 1951 I saw all the cases of poliomyelitis admitted from Northamptonshire and North Buckinghamshire, which include a mixed rural and industrial population of approximately 400,000. These amounted to approximately 200 cases. During that time, although on the look-out for the disease, I saw or heard of only a few cases of Bornholm disease. It may well be that other cases occurred and were treated by general practitioners, but certainly there was no epidemic corresponding to those of poliomyelitis. I formed the impression that the cases of Bornholm disease occurred outside the epidemic period of the poliomyelitis, either a few weeks before or after.

On the other hand, in the Oxford Hospitals covering a comparable population, again mixed industrial and rural, with the additional University population, poliomyelitis is a relatively infrequent disease, but large epidemics of Bornholm disease have occurred, especially in the years 1950 and 1951. In the latter epidemic Warin *et al.* demonstrated the presence of a Coxsackie virus of the B group.

Again in 1947 in military hospital practice I saw numbers of cases of poliomyelitis, but no Bornholm disease, from the

Catterick military camp.² This camp is in close geographical proximity to the rural area of Wensleydale, in Yorkshire, where Pickles³ made his original observations on Bornholm disease, but there is little actual contact of populations, as most of the troops spend their leisure hours in the larger towns to the north and east, or on leave in other parts of the country. I made an inquiry among the general practitioners of Wensleydale, and gained the impression that there was little or no poliomyelitis in this dale, which runs some 20 miles into the Pennine Hills, but that there had been cases of Bornholm disease for some years previously.

These facts seem to be in conformity with the views quoted by Dalldorf that there is in fact clinical and epidemiological evidence of competition between these diseases. This competition does not appear to completely exclude the other disease, in my experience, but that may be due to the fact that I have not localized the cases sufficiently accurately in season of year or geographically. Bornholm disease is well known for the extremely localized nature of the outbreaks, and it may be that poliomyelitis cases in Oxford in the year in question did in fact come from parts of a town or county unaffected by the former disease.

In 1949 and 1950 in Kettering, Northamptonshire, I was able to find evidence of Coxsackie virus Type A₂ infection by complement-fixation test in five cases diagnosed as non-paralytic poliomyelitis, and follow-up of contacts revealed 25 cases of illness all with positive complement-fixation tests to this virus comprising the following: paralytic poliomyelitis, 6; non-paralytic poliomyelitis, 10; Bornholm disease, 6; infective hepatitis, 3. Antenatal controls from the same town in 1950 gave only two positive complement-fixation tests in 35 tested.⁴

During 1950, out of 92 cases of poliomyelitis from Northamptonshire and North Buckinghamshire, I obtained specimens of sera from 80 patients which were tested in the laboratory of the late Dr. Marshall Findlay for evidence of complement fixing antibodies to the Coxsackie virus Dalldorf Type A₁. Of these approximately 60% were positive and the percentage of positives was the same in both paralytic and non-paralytic cases. In the same year I was able to trace only seven cases of Bornholm disease, and these all had complement-fixing antibodies to the Dalldorf Type A₁ Coxsackie virus in high titre of 1 in 20 or greater than 1 in 20. Unfortunately these cases were not tested for evidence of antibodies to the Coxsackie virus B types, such as has been found in association with Bornholm disease elsewhere.

The whole ecological relationships of these viruses needs to be carefully investigated, but work in this country is at present very considerably handicapped by lack of adequate virological laboratory facilities. I have the impression that competition does in fact exist between poliomyelitis and Bornholm disease, but whether this is a direct interference phenomenon between the poliomyelitis virus and the Type B3 Coxsackie virus, or whether there is yet another stage in the process such as an interference phenomenon between a Coxsackie virus Type A found to be associated with poliomyelitis in Northamptonshire and the Type B Coxsackie virus of Bornholm disease, would seem to need further investigation. It is not only in this field that further work is necessary, but also in discovering whether there is any ecological relationship between the Coxsackie viruses, the poliomyelitis viruses, and the yet undiscovered viruses of cases of meningo-encephalitis which appear to have become so much more common in the past three years.

One last observation concerns the severe epidemic of poliomyelitis in Denmark in 1952, when the Island of Bornholm had the highest number of notified cases of poliomyelitis, 140 per 100,000 population.⁵ Is it just chance that this island which gave its name to the disease some 20 years or more ago should be so affected with poliomyelitis? Pickles refers to Wolter's description of remarkable epidemics named "Haffkrankheit" which affected fishermen on the shores of the Frisches Haff, a narrow gulf communicating with the Baltic, as belonging to the same family of diseases as Bornholm disease, with the important difference of a substantial mortality among the sufferers. Wolter identified these outbreaks with one in 1529 in the Haff of Stettin, part of an epidemiological phenomenon known as the "English sweat," and in an attempted elucidation of the aetiology brought in the theory formulated by Sydenham and expounded by Pettenkofer that epidemic disease is "conditioned by place and time." In conclusion I quote Pickles⁶ on Bornholm disease: "Epidemic myalgia is of importance only as a mimic of well-known dangerous conditions, but the resemblance to this more serious malady (Haffkrankheit) is close, and it would be imprudent to conclude that future appearances of the disease may not have a more ominous significance."

Clearly much more research is required into the ecological factors of these diseases and particularly the questions of virus interrelationships, virus interference, and virus exalta-

tion. Dare we hope that this country will not lag behind the fine example of virus research set by America?—I am, etc.,

Oxford.

R. WIGGLESWORTH.

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- ¹ *British Medical Journal*, 1953, 1, 1345.
- ² Dixon, G. J. (1948). *Ibid.*, 1, 1175.
- ³ *Ibid.*, 1933, 2, 817.
- ⁴ Voss, H., and Benthams, F., personal communication.
- ⁵ *Lancet*, 1953, 2, 196.
- ⁶ *Epidemiology in Country Practice*, 1939. Wright, Bristol.

Medical Semantics

SIR,—The Arabic origin of *nucha*, *mater*, *basilic*, and *cephalic* is not my suggestion, as Dr. A. M. Woolman (*Journal*, July 25, p. 225) seems to think. The problem has long engaged those interested in Semitic philology and arises from the strange fact that these words are not found in any classical text. *Basilic* and *cephalic* first appear in a ninth-century translation of Galen into Latin from the Arabic. The subject is fully discussed by Hyrtl (*Arabische u. Hebräische in der Anatomie*, Vienna, 1879) and by Rabin and Singer (*Prelude to Modern Science, being a Discussion of the History. Sources etc. of the Tabulae Sex of Vesalius*, Cambridge, 1946). Rabin and Singer think these words came through rather than from the Arabic, but their origin is anybody's guess. As to *mater*, Dr. Woolman has misunderstood me. This word seems to be a translation into Latin of the Arabic word meaning *mother*.

Whether Germany is north, south, or east of the British Isles is immaterial. The point is that the classical stream, like most streams, did not run in a straight line but was kept south of Central Europe by the Alps. This is an elementary fact of history and geography. Dr. Woolman says that "most German doctors have a more thorough knowledge of Latin than their English colleagues." This I am prepared to believe. It has, however, nothing to do with the fact that intermittently for 1,900 years England was bathed in the classical stream—by the Roman occupation and later by the Norman conquest and the close association with France in the Middle Ages—for the most part of which period countries to the north of the Alps were in a state of barbarism. It is just because Germany was outside the mediaeval classical stream and not because of any superiority in classical education of to-day that, in Dr. Woolman's words, "in English medical writings the Latin terms are often anglicized, in Germany the original Latin is usually employed." Innumerable instances could be given. In order to come into line the Germans had to substitute *ulcus* for *Geschwür* because they had no such word as *ulcer* in ordinary speech. Dr. Woolman thinks *Erreger* more convenient than *offending organism*. *Erreger* is not primarily a medical term but a term in general use meaning agitator, exciter; *offending organism* is new to me.

When I said that German words are clumsy I was, of course, speaking as a non-Teuton. We, after all, are in the great majority. Whether *Schnecke* is more elegant than *cochlea* is a matter partly of taste, partly of nurture. I think I am correct in saying that to the majority of non-Teutons German medical words are as cacophonous (*missklanglich*) as they are cacoptic.—I am, etc.,

Histon, Cambs.

FFRANGCON ROBERTS.

Breast-feeding in the Oxford Survey

SIR,—It is, I think, unfortunate that the study which Dr. Alice Stewart and Dr. Celia Westropp have made of the relationship of bacterial infections to artificial and breast-feeding in infancy (*Journal*, August 8, p. 305) should have been published in a journal which is the main source of medical news in general practice. I do not doubt the validity of their conclusions in relation to the case material of their survey, and at one point they remark, "That breast-feeding has advantages to both mother and child which will not show on a weight chart no paediatrician will seriously deny" (I do not know why it should be only paediatricians who might deny it, nor why they should be inclined to do so light-heartedly). But elsewhere they say that the survey

presents a new challenge to the advocates of natural feeding, and I think that many will conclude, after reading this paper, that we have been mistaken in thinking that breast-feeding is of great importance for infant health, and that it matters very little that infants should be fed on a bottle.

I do not think that any reasonably informed doctor has claimed, since the need for sterile technique in bottle-feeding became recognized, that breast-feeding produced infants who were heavier or larger than those who were fed on cow's milk, but we have been accustomed to advance two arguments in persuading nurses and colleagues (not mothers, who rarely need persuasion) that it is worth while to study the subject of human lactation so as to be able to offer useful advice. The first argument has rested on a rather large body of evidence that breast-fed babies are less liable to respiratory and enteric infections; the second argument depends on the rapidly accumulating evidence that successful breast-feeding is an important feature in the development of a good relationship between mother and child, which is the foundation of a good personality. The latter conception is not merely a romantic picture entertained by artists, poets, and sentimentalists, but is quite as intellectually satisfying as the story of scurvy and vitamin C.

The variables are so many in a study of the kind which Dr. Stewart and her colleagues have been making, and the application of mathematics to such material has become so esoteric, that one is naturally hesitant to criticize a conclusion made upon the authors' own ground. Nevertheless, I do not feel inclined to discard the accumulated evidence of the past that the feeding of an infant at its mother's breast has a value in protecting him from the effects of bacterial infection. No doubt the position is altering rapidly, as the hazards of bacterial infection in the first year are reduced, but the social gradient in respiratory infection remains as a sign that very many infants do not receive the best nurture. As the authors themselves point out, the survey excluded weakly infants and provided quite unusually good medical supervision of bottle-feeding. I think that the observations of Dr. Stewart and Dr. Westropp deserve to be noted as a check on what may be a too great readiness to rely upon work which is now out-dated in respect of this one feature of immunity to bacterial disease. But I fear that their paper may easily become a conscience-quelling text for those who do not want to bother themselves about the physiology of lactation.—I am, etc.,

DUNCAN LEYS.

Farnborough, Kent.

Tropical Diseases in Britain

SIR,—I have reread the annotation on this subject (*Journal*, May 16, p. 1096), certain points in which have been taken up by Professor W. Melville Arnott (*Journal*, May 30, p. 1219) and others.

It is unfortunate that in tropical Africa, where I served for many years, a blood film may not confirm the diagnosis of malaria, even in those who have not been taking one of the suppressives. In fact, it is surprising how many of the worst cases have negative films. One has little choice in such cases, and quinine or mepacrine must be given as soon as the film has been taken. There is an old and very true saying that "many a man has gone to his grave because of negative blood films." It certainly is true in the case of infants, so much so that it is prudent to give quite a large number of "febrile tooth-cutting" cases a quinine or mepacrine injection. This is better than finding the child dead, the blood film having been negative and a tooth really on the way through, but no quinine having been given.

There is no mention in the annotation of the type of patient who takes mepacrine or proguanil daily and who, sooner or later, gradually feels more and more depressed and weary, loses appetite, and feels that he no longer seems to be able to stand the heat. This is an example of imperfect suppression, but the parasites seldom come into the peripheral blood to give a positive film. Two things can be done: (a) stop suppressives and let an overt attack come up, treating this when it comes, (b) keep taking daily proguanil and add to it a full course of mepacrine or quinine. There will be no positive blood film, but there will be such a suspicious improvement that neither the M.O. nor the

patient will have much doubt about what has been wrong. A "therapeutic" diagnosis, but, I venture to say, by no means unwarrantable.

I agree with Dr. Bruce Nicol (*Journal*, August 1, p. 288), and consider that the paragraph in the annotation on amoebiasis is so sweeping that the following paragraph on liver abscess does not quite smooth things down.

It is easy to state that persistently recurring diarrhoea, sometimes with the passage of blood and mucus, should raise suspicion of *E. histolytica*. I wonder how often your writer has seen such signs. In the course of some 23 years in Uganda I was stationed for much of the time in districts with an appallingly high incidence of amoebiasis, and found acute symptoms in only a small proportion of the thousands of patients seen—probably no more than 10%. In acute cases the diagnosis is easy, as the free-living *E. histolytica* is present, and "an experienced pathologist" is not necessary. We all had to become reasonably proficient in laboratory (routine) work, and I think we "got by" fairly well. The type of case which gives us most difficulty is that of amoebiasis with no localizing signs at all. This is the patient with loss of appetite, tiredness, inability to concentrate, easily upset, and mentally irritable. He has never to his knowledge had an attack of diarrhoea. He has been in districts known to be heavily involved, however, in his younger days. He may be suffering from liver amoebiasis, as is suggested in the annotation, but equally may have an old-standing infection of his caecum or, less commonly, his sigmoid. Daily stool tests for weeks will be negative. As Dr. Bruce Nicol states, and as I stated some years ago,¹ one grain (65 mg.) of emetine parenterally will produce cysts next day. These are usually uni- or binucleated—i.e., early—and are easily explained. When conditions in the host become bad, the amoeba encysts and goes on its way to find another more receptive host. The bad conditions are created by the dose of emetine. Prior to this, the amoebae have been pursuing a more or less placid existence, well away from the lumen of the large intestine, and are not likely to encyst in large numbers in order to escape to the exterior, being in no need of any change.

I suppose that this is "therapeutic" diagnosis, but, in defence of my own test, I do not agree that it is to be deprecated. Following a positive result, one grain (65 mg.) of emetine is given daily for another two days. There is no need to risk myocardial damage by giving more than three emetine injections. All signs, vague and definite, will disappear and the patient, much better, should then change to one of the other drugs, such as chiniofon ("quinoxyl"), di-iodohydroxyquinoline ("dihaloquin"), etc. If the stools are negative after an emetine injection, my experience over the years leads me to believe that the patient is unlikely to be suffering from old amoebiasis.

Incidentally, did Dr. Nicol find out this little test by himself, or is he one of the few who have adopted it after perusal of my letter in 1946? I have used this test frequently since 1929 with very few failures. I have mentioned it to numerous colleagues, but few seem to have adopted it. Those who did were very satisfied. Perhaps I may hope that others may record their views on the test after a fair trial. I have every reason to believe that the test, devised by me without any knowledge of any other worker doing so, is my own, but I shall await the comments of others.—I am, etc.,

Bridge of Earn, Perthshire.

A. FORBES BROWN.

REFERENCE

- ¹ *British Medical Journal*, 1946, 2, 838.

Neonatal Asphyxia

SIR,—Endotracheal intubation of the newly born is usually left to the anaesthetist. For this reason the technique is more often associated with neonatal asphyxia following delivery by caesarean section. Nevertheless, neonatal asphyxia is by no means peculiar to operative or instrumental means of delivery.

Having used the method over a period of several years, I am impressed with its value in certain particular circumstances. Most striking is the effectiveness of pharyngeal toilet under direct vision. Even more impressive is the certainty with which a good colour can be achieved with intubation and inflation. Follow-up of cases where necropsy has afforded an opportunity to look for injury has revealed no local haemorrhages, emphysema, or trauma resulting from the intubation and inflation. The trachea has been free from damage even after intubation lasting several hours.

The ordinary anaesthetic rebreathing bag is too big for use with the newly born, and an ordinary surgeon's rubber glove taped to the "T" piece has been quite suitable in practice.—I am, etc.,

Watford.

J. NOEL JACKSON.

SIR,—Your annotation on neonatal asphyxia (*Journal*, August 8, p. 328) is fascinating because it shows the wonderful ingenuity that is being shown in overcoming asphyxia by methods far out of reach of the general practitioner, who is most likely to meet the condition. But it is also depressing because apart from an initial reference to "central depression" there seems no reference to the fundamentally important work of the late Sir Joseph Barcroft,^{1,2} who not only showed how the condition normally arises but also gave pretty clear pointers to the way it should be treated.

In December, 1948, I expressed the hope that the considerable correspondence following a letter I had written³ would "ensure that the practical application of Sir Joseph Barcroft's discoveries will no longer be neglected in midwifery teaching, practice, or textbooks"; but it seems to have been a vain hope. He showed that, while oxygen is, of course, necessary for the full control of the brain over respiration, in the foetus of the sheep the earliest respiratory responses came not from oxygen lack but from cutaneous stimulation, at first a single spasmodic gasp (34th day), then one accompanied by two or more contractions of the diaphragm, then two gasps, gradually increasing in number and rapidly till a full respiratory rhythm following cutaneous stimulation is established (50th day) several days before (65th day) occlusion of the cord—that is, asphyxia—will initiate respiratory movements. He even showed at what level in the brain these various responses occur, and that later on asphyxia seemed progressively to depress the functional cerebral level, so that the greater the degree of asphyxia the more primitive the response going back from full respiration to a succession of gasps, a single gasp, and finally none at all. Most of us have at some time or another seen newborn babies in each of these states.

The clinical bearing of these discoveries is clearly that, though the baby is giving occasional gasps or none at all as a result of asphyxia, the lack of oxygen will not initiate respiration, whereas stimulation will or may. Your annotation calls this cutaneous stimulation "little better than punitive," but Sir Joseph in his *Linacre lecture*² says "pain (if such a word can be applied to an organism so anoxaemic that it can have no real consciousness) can have a dramatic effect. There can be no more specific reaction than that of the gasp in a refractory rabbit's foetus when the ear is firmly pinched." Even though oxygen is given to an asphyxiated baby it will, in fact, only be giving its primitive responses to stimuli until full respiration is attained; and this may take a long time, much longer, in fact, if the very gentle methods you advocate are adopted and the reasonable stimuli used in the past are avoided. The first cry is probably a rough dividing-line between these two quite distinct methods of respiration, though there is no doubt that a little stimulation will notably increase the vigour of the cry and aid expansion of the lungs.

There is another way of attacking this problem, to which I have drawn attention many times previously and which had the approval of Sir Joseph. This is to inject some convulsant drug which will so raise the sensitiveness of the depressed cerebral functions that they will respond to stimuli to which they were previously inactive. It is true that you do mention the use in narcosis of N-allyl normorphine, which I cannot find in the latest *Extra Pharmacopoeia*. You also mention, without much conviction, the use of nikethamide. Now nikethamide does happen to be a mild convulsant, but nothing like so effective or consistent as leptazol, and for nearly 20 years I have used with great success a preparation of this ("cardiazol ephedrine") and urged its adoption for nearly 14. Within a few seconds it takes the infant from the non-breathing or occasional gasping stage to full respiration and vigorous crying, so that in most cases the ingenious and complicated devices you describe are quite unnecessary, and it can be used anywhere. Incidentally, injection into the ventricular cavity is simpler, quicker, and more certain than intravenous injection, and perfectly safe.

However, the main purpose of this letter is not to recapitulate details which ought by this time to be matters of common knowledge, but to suggest that if our pundits persist in disregarding fundamental information about the physiology of respiration in the newborn it is no wonder that, as you noted (*Journal*, July 25, p. 199), while the maternal

mortality rate has been quartered in the last 20 years, the stillbirth rate remains unchanged. The intrinsic importance of this subject, as evidenced by the recent report of the Medical Research Council, and also the personal distress caused through stillbirth and neonatal mortality (for my first child was stillborn), are my only excuses for sending you another long letter giving salient points which your annotation seems to ignore.—I am, etc.,

W. N. LEAK.

Winsford, Cheshire.

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- ¹ *British Medical Journal*, 1939, 2, 986.
- ² *Lancet*, 1942, 2, 117.
- ³ *Researches on Pre-natal Life*, 1946, chap. 22 and appendix 1. Blackwell, Oxford.
- ⁴ *British Medical Journal*, 1948, 2, 797.

Aureomycin in Ophthalmology

SIR,—I read with considerable interest the article on "Aureomycin, Chloramphenicol, and Terramycin in Ophthalmology," by Professor Arnold Sorsby, Dr. Joseph Ungar, and Mr. R. P. Crick (*Journal*, August 8, p. 301), but must express surprise that such a conclusion with regard to aureomycin should have been reached on so little evidence. The writers state: "It may be concluded that, of the newer antibiotics, aureomycin is of little value in ophthalmology."

As a clinician who has used aureomycin over several years I may say that in my experience aureomycin is the antibiotic of choice in ophthalmology, and I know that many of my colleagues agree with this.—I am, etc.,

H. CAMPBELL ORR.

Wolverhampton.

Dangers of Ethanolamine Oleate Injection Treatment for Varicose Veins

SIR,—In view of the frequency with which injection treatment for varicose veins is carried out, the following case is of interest as a reminder that such a procedure carries a risk.

A married woman aged 45 years, with three children, was referred to the out-patient clinic for treatment of varicose veins. She complained of pain and swelling below the left knee and said that she had injured her left tibia when young. There had been no previous injections for varicose veins. The patient, who was menstruating, appeared to be a healthy woman with a moderately severe degree of varicose veins below the left knee; she was considered suitable for injection, and 6 ml. of ethanolamine oleate B.P. was given slowly with the patient standing on a chair. (Material from this same bottle had previously been used without incident to inject other patients.) She got down off the chair without difficulty and was asked to report the following week for a further injection. She walked out into the waiting-room, but collapsed two or three minutes later and was found to be unconscious. She had three epileptiform convulsions in quick succession and became pulseless. Resuscitation methods, including cardiac massage through an incision in the diaphragm and intracardiac injection of adrenaline, were without avail. At necropsy, about six hours after death, no evidence of pulmonary, air, or fat embolism was found. The brain appeared normal. There was no thrombosis of the varicose veins at the injection site, and only a little surrounding haemorrhage. In spite of a further examination of the principal organs microscopically the only abnormalities found were the presence of some thick mucus in the trachea and bronchi, emphysema and anthracosis of the lungs, and some petechial haemorrhages on the posterior surface of the heart. The remains of the bottle of ethanolamine oleate were cultured aerobically and anaerobically and found to be sterile.

After death it was discovered that the patient was a chronic asthmatic and that she had had an acute attack of asthma the night before, for which she had taken a tablet of isoprenaline. The most probable cause of death seems therefore to be an allergic reaction to the injection. Since the patient had had no previous injection of ethanolamine oleate, one must speculate that she had become hypersensitive in some other way to the "foreign" protein formed later by the interaction of serum protein with ethanolamine. Perhaps hypersensitivity had arisen by previous inhalation of some complex substance having radicals similar to the relatively simple chemical substance ethanolamine.

On discussing this tragedy with our colleagues we have obtained verbal case histories of several other severe complications following injections of ethanolamine oleate. They

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include severe collapse followed by status asthmaticus in a patient with no previous history of asthma, collapse and convulsions in two soldiers immediately after injection, and haematuria the day after injection in another patient. All these patients had received previous injections and all made complete recoveries.

It is clear that the use of ethanolamine oleate is not free from danger. It should not be used in asthmatic patients and adrenaline should be available for immediate use.—We are, etc.,

A. LUTTON.

G. H. GRANT.

Shrewsbury.

Phenylbutazone

SIR,—So much has been written of the dangers of phenylbutazone ("butazolidin") that it was with no little trepidation that we first administered it to a patient who had suffered from rheumatoid arthritis for 27 years. However, she was having so much pain and disability that we began with two tablets thrice daily for two days, and then dropped to one twice daily for two days, and one per day from then on. The results were more than gratifying. The pain disappeared and much increase in the movement of hands and feet was experienced. The improvement continued on the low dose of one tablet per day. The patient felt that, to use her own words, she "could walk like a young one." She was encouraged to cut the dose even further, and now only takes a tablet when a return of pain threatens, about once per week or ten days.

This case was so encouraging that we determined to try the effects of low-dosage phenylbutazone on another patient who had suffered from rheumatic pains for 25 years. She began with one tablet morning and evening for the first day and one per day after that. On the fourth day, all smiles, she reported that she had been free from pain since the second day. She was advised to keep to the one tablet a day if necessary, but to try to cut the dose even further. After returning from a holiday she has taken only four tablets in all during the last 21 days. She has no pain, has been climbing hills which her husband thought impossible for her, and feels and looks much younger. She can now wear size 4½ in shoes, whereas for the last 20 years she could only wear size 6. A third patient, a martyr to rheumatoid arthritis for 20 years, was discharged unchanged from hospital after six weeks' treatment by cortisone, etc. Small-dosage phenylbutazone so relieved his pain and disability that he has been able to attend to business quite comfortably. A fourth patient, a woman with a crippled right ankle which would not respond to other treatment, can now stand on her toes and dance under the regime of two phenylbutazone tablets on the first day and one as necessary thereafter.

The above are only four cases out of over 20 which have benefited in a marked degree by low-dosage phenylbutazone. Two cases would not tolerate the preparation at all. None of the remainder has shown the least sign of ill effects. One cannot but wonder whether the high dosage of two tablets thrice daily is necessary. It will be interesting to try on our next patient the effects of one tablet twice a day the first day, one daily for a week, and then one tablet only if the pain threatens to return. On such low dosage might not the troublesome side-effects of this so useful therapeutic agent be largely eliminated?—I am, etc.,

Kirkcubbin, Dumfriesshire.

BOWMAN EDGAR.

Control of Tachycardia by Quinine

SIR,—The report of a case of paroxysmal tachycardia controlled and prevented over a period of two years by the use of daily prophylactic quinine hydrochloride may be of interest. I have never read of the use of quinine, used in the same way as for malaria prophylaxis, being effective in preventing attacks of paroxysmal tachycardia, but it is possible that having spent the last three and a half years in a fairly inaccessible part of West Africa I am not as well informed as I should be. Certainly the books at my disposal here make no mention of it except quinine's inferiority to quinidine in stopping an attack.

The patient was an American male, aged 30, of unusually good physique and a good all-round athlete and football player. Attacks of "palpitations" began at the age of 24, and at first

came only once or twice a month, and only after considerable physical or nervous strain. They lasted five to ten minutes and then disappeared. The patient ignored the symptoms so far as possible, and no one else took them seriously either, which was not surprising considering his general athletic prowess at that time. At the age of 25 the patient came to Sierra Leone and spent three exceedingly strenuous years as a missionary, trekking, building roads, and travelling great distances by jeep. The attacks increased slowly in frequency. He had a year in America and returned in July, 1951. At this time I was stationed with the patient, and for the first time heard his history. By now he was getting four or five attacks a week lasting up to 25 minutes in duration, and his work was beginning to be interfered with. During an attack, which was always in the late afternoon, he would become breathless, pale, and distressed. On examination during an attack he had no abnormal physical signs other than a pulse of 170 which did not vary with exercise. No electrocardiogram was available. In view of the relationship between quinine and quinidine I put the patient on quinine hydrochloride, 5 gr. (0.32 g.) daily, and took him off proguanil, which he had been taking ever since coming to West Africa. From the day the change-over was made the attacks ceased absolutely, in spite of the fact that for the last two years the patient has undertaken heavier work than ever.

I should be interested to know whether others have found that attacks of paroxysmal tachycardia can be controlled by the use of oral quinine in this way and, conversely, whether there have been cases of this cardiac irregularity frequently observed among the many thousands of people who have for years in the Tropics been taking their quinine regularly, and without any apparent ill effects to their general health. Of course I am referring to cases that have no apparent associated organic heart disease.—I am, etc.,

H. L. MACLURE.

Magburaka, Sierra Leone.

Tic Douloureux

SIR,—In reply to Dr. David M. Zausmer (*Journal*, August 8, p. 340), may I make a plea to reject the term "facial neuralgia" in favour of the vintage name "tic douloureux," not because "tic douloureux" is more accurate, or precise, or scientific: it is none of these things. But it is fifteen thousand times more interesting and colourful and evokes a phantasmagoria of twisted and contorted beings from the Hunchback of Notre Dame to Captain Hook, and all the Seven Dwarfs rolled into one.

Moreover, the very sound of the syllables "doul-our-eux" (which should be rolled well over the molars before they are finally delivered with a sad and mournful look) is calculated to subdue even the most agitated patient. And that, after all, is half the cure.—I am, etc.,

FRANK S. RICKARDS.

Lancaster.

Hops in Ale

SIR,—It is true that the use of hops in brewing ale was forbidden in the sixteenth century, as Drs. J. S. Cookson and Anne Lawton have stated (*Journal*, August 15, p. 376). It is not correct, however, that their use in brewing was forbidden altogether.

Ale in the Middle Ages, and in many places until the eighteenth century, was brewed with malt, yeast, and water only. Containing no such preservative as hops, it must often have turned sour a few days after reaching prime condition. Hence, probably, the attempts (in due course forbidden by regulations) to keep stale ale from becoming undrinkable by adding hops. The art of flavouring and preserving malt liquor by boiling it with hops before fermentation was introduced into this country from the Continent at the end of the Hundred Years War. This beverage, beer, first met with opposition in the City of London, but soon came under royal protection. A writ was issued in 1436 in the name of Henry VI ordering the City authorities to proclaim that the "drink called beer is a notable, healthy and temperate drink" and that anyone maligning it would be punished. This did not prevent the occasional "die-hard" in dietetics, like Andrew Boorde, from fulminating against "bere, the naturall drynke for a Dutche man," and lauding ale as "for an Englysshe man the naturall drinke . . . it doth ingendre grose humoures; yette it

maketh a man stronge." But beer gained steadily in popularity and the unhopped ale had disappeared by the end of the eighteenth century.

The terms "ale" and "beer" were apparently becoming less distinctive in the latter half of the sixteenth century, for a letter from Leicester to Burleigh during one of Queen Elizabeth's progresses states: "We were fain to send to London, and Kenilworth, and divers other places, where ale was; her (the Queen's) own bere was so strong as there was no man able to drink it."—I am, etc.,

London, W.1.

C. L. SHAW.

Hop Dermatitis

SIR,—The valuable observations of Drs. J. S. Cookson and Ann Lawton (*Journal*, August 15, p. 376) on hop dermatitis seem to suggest that the hop-cone and fresh hop-oil contain a primary irritant. The very high incidence of minor dermatitis (1 in 30 in a "light season") suggests a primary irritation rather than allergic hypersensitivity, which might perhaps account only for the most severe cases. It would therefore be interesting to know whether normal subjects were patch-tested with hop-cones and with fresh hop-oil; and also to know what dilution of hop-oil would still produce a positive reaction in the affected persons. Primary irritation by the oil would explain the positive patch-tests in patients whose dermatitis was really due to resins, and would account for the unexpected positive reactions obtained with those substances.

This question is of theoretical as well as practical importance. It has been supposed that hardening, if it occurs at all, occurs only in respect of primary irritants and does not result where there is a high degree of allergic sensitivity. A good many plants or their juices are primary irritants.—I am, etc.,

London, W.1.

F. RAY BETTLEY.

Acute Appendicitis in Infancy and Early Childhood

SIR,—I read with great interest the valuable article by Mr. G. L. Bunton on acute appendicitis in infancy and early childhood (*Journal*, July 11, p. 71). The following case emphasizes all the points discussed.

I was asked to see a baby of 5½ months suffering from gastro-enteritis. As those were the days before antibiotics the child had been treated with sulphonamide tablets, which it was no longer able to retain, and a small-bowel washout. She had been ill two and a half days. The first symptom was that of recurrent colic with attacks of screaming and drawing up of her legs. The attacks came in waves. She then started to pass loose, mucous stools which became more frequent. On the second day she began to vomit.

She was a bottle-fed baby with no history of any dietetic errors. She was an only child looked after by a conscientious children's nurse and had no history of a possible source of infection of the gastro-intestinal tract. The child was screaming and drawing up her legs. She was vomiting boiled water. Her temperature was 103° F. (39.4° C.) and her pulse fast. She was flushed and toxic to look at. She hated being moved, and if left in her cot lay curled up. Her ears, throat, urine, etc., showed no source of parenteral infection. On abdominal palpation she was acutely tender over the right iliac fossa and drew up her right leg each time this area was palpated. She was operated on for acute appendicitis and made a complete recovery.

This case illustrates the very important points in Mr. Bunton's article. Appendicitis in very young children is not quite as rare as books often make us believe. Diarrhoea can be the presenting symptom in infants. In the young baby abdominal pain of acute appendicitis presents a picture of colic coming in waves causing screaming attacks with the flexion of legs. If left alone the baby will lie curled up to try to ease the abdominal pain. In the very young a considerable rise in temperature and pulse can be associated with appendicitis. The clinical picture of a young baby vomiting, passing loose frequent stools accompanied by abdominal colic, can so easily be mistaken for "gastro-enteritis," which, after all, is not a disease but a symptomatic title.—I am, etc.,

Dublin.

MADELINE R. EPSTEIN.

POINTS FROM LETTERS

"Fibrositis"

Dr. COLIN R. PORTEOUS (Liverpool) writes: I was interested to read the account of the discussion on "fibrositis" in the second plenary session at the Annual Meeting of the B.M.A. at Cardiff (*Journal*, July 25, p. 205). I have sometimes wondered whether a proportion of cases of agnogenic "fibrositis" are due to infarction of a small area in the erector spinae muscles following occlusion to one of the posterior branches of the lumbar or intercostal arteries. At necropsies I have occasionally noticed atheromatous plaques around the mouths of the paired arteries arising from the posterior wall of the abdominal aorta.

Bathing Caps for Males

Dr. M. D. WARREN (London, W.5) writes: In the last two weeks I have treated four cases of otitis externa and one case of a flare-up of otitis media. The symptoms in all five cases had come on after swimming, and all the cases were males. I suggest that this preponderance in males is due to the fact that they do not wear a bathing cap. If this is so, then perhaps much illness and discomfort could be avoided if men could be persuaded to wear a type of bathing cap that would protect their ears. I would suggest a pattern similar to a scrum cap seen on the rugby field.

An Interesting Phenomenon

Dr. B. N. PAJGAR (Thornton Heath) writes: I do not know if anybody has mentioned before the very interesting phenomenon whereby a person can see with the naked eye his own blood corpuscles actually in circulation in the blood vessels and capillaries. If a person sits or reclines facing the light, and half closes his eyelids so that a little light is allowed in, then he can see the corpuscles flowing and swaying in rhythm to the circulation. They are grouped in varied numbers and shapes, but mostly agglutinated in clumps or spiral lines, presumably the shape of the capillaries. The walls of the capillaries can be clearly seen, with blood cells lying inside and sometimes outside the lumen. Occasionally larger and solitary cells are seen, probably the white blood corpuscles.

Malaria

Dr. ROBT VAN SOMEREN (Nyeri, Kenya) writes: I have just seen the *Journal* of May 30 and can thoroughly endorse the letter of Professor W. Melville Arnott (p. 1219) on malaria. Last week I was revisiting my old station, Jinja, where the immense dam is being constructed at the Owen Falls, and was interested in two particulars. Mosquito gauze to houses and mosquito nets seemed to be very little used, reliance being placed on flitting each room, especially under the beds, with D.D.T. I did not notice any mosquitoes. Also, where formerly *Simulium damnosum* was rife and a curse rendering life on the west bank of the Nile particularly unbearable, not one was noticed, owing to the wide spraying of the banks with D.D.T.—from planes, I understand. Should there be any recurrence, respraying is carried out. To one who knew the conditions 40 years ago the change is remarkable and reflects the very greatest credit on the present medical staff who are responsible for this wonderful work.

Mist. Amygdalae

Dr. A. H. TURNER (Ruabon, Wrexham) writes: I have tried in vain to get someone to supply mist. amygdalae. This quite simple preparation was in the B.P. up to 1914, if not later. During the last war almonds became scarce, but they are obtainable now and there does not seem to be any reason why the mixture should not be obtainable. My local chemist cannot supply it and about half a dozen front-line manufacturers say they cannot do it.

Cancer and the Public

Dr. M. N. PAI (London, W.C.2) writes: The sting of Lord Horder's letter (*Journal*, July 18, p. 148) is in its tail. That 76% of the general practitioners did not even bother to reply "Yes" or "No" is an index of the indifference of the overwhelming majority of practitioners to the cancer problem and their lack of co-operation in this humanitarian work. As regards the public, the campaign for road safety has not diminished the number of preventable accidents, and lay education in cancer is unlikely to achieve any useful purpose. There is a real danger that such education may lead to vexatious demands on the part of querulous patients for "full and complete investigation" for every minor symptom, and, if this is not done to their satisfaction, to an increase in the incidence of litigation neurosis. Errors either in diagnosis or in treatment may be followed by actual litigation against doctors and hospitals.

Obituary

J. W. STRUTHERS, LL.D., M.B., F.R.C.S.Ed.

Mr. J. W. Struthers, a past-president of the Royal College of Surgeons of Edinburgh, died at his home at Gullane, East Lothian, on August 15 at the age of 79, after a long illness.

John William Struthers was born on May 3, 1874, the son of the late Sir John Struthers, professor of anatomy in the University of Aberdeen from 1863 to 1889 and, later, president of the Royal College of Surgeons of Edinburgh. He was educated at Loretto, and remained a staunch supporter of his old school throughout his life, acting as governor for many years. After graduating M.B., Ch.B. at Edinburgh University in 1897, he decided to specialize in surgery, and became a Fellow of the Royal College of Surgeons of Edinburgh two years later. Appointed assistant surgeon to Edinburgh Royal Infirmary in 1913, he was promoted to the charge of wards in 1924, retiring from the active staff in 1939. He served the University of Edinburgh as a



lecturer in clinical surgery, and in 1930 was appointed a member of Faculty and of the Senatus. The honorary degree of LL.D. was conferred upon him by the University in 1946. During the first world war he served first with a Red Cross hospital at Rouen and later at Salonika as a major in the R.A.M.C. For his services he was awarded the Serbian Order of St. Sava.

Mr. Struthers received his surgical training at a time when the only specialties recognized were gynaecology and obstetrics, ophthalmology, and oto-rhino-laryngology. He had the advantage, therefore, of a broad basis for his training and became a very able general surgeon. He was a remarkably accurate diagnostician, and this was due as much to his persistence and his capacity for taking infinite pains as to his sound knowledge of pathological processes. As an operator he was conservative in his methods and careful in their execution, making no attempt to impress the onlooker. He took a special interest in diseases of bone, and, in association with his friend, the late Dr. James Walker Dawson, histologist in the laboratory of the Royal College of Physicians of Edinburgh, he carried out important pioneer work in the elucidation of the pathology and treatment of generalized osteitis fibrosa: he was among the first surgeons in this country to carry out the removal of a parathyroid adenoma in the treatment of this disease. The importance of this work was recognized by the allocation of an entire number of the *Edinburgh Medical Journal* to descriptions of it. At the request of the Department of Health and in association with Dr. H. E. Seiler he carried out a survey of the hospital facilities in the south-eastern region of Scotland: this was shortly before the introduction of the National Health Service.

The Royal College of Surgeons of Edinburgh was one of the great interests of his life, and he maintained this interest until shortly before his death. He was secretary and treasurer for 14 years before serving as president from 1941 to 1943. As secretary he had the welfare of the College very close to his heart and devoted a great deal of his time to its affairs. He was responsible for many improvements in the premises, including the decoration of the library, the lighting of the hall, and the alterations in the main entrance. After his retirement from the office of president his advice was much sought after and highly valued by his successors in office. A member of the British Medical Association for 56 years, he was president of the Edinburgh Branch in 1931-2. When the Association held its Annual Meeting at Edinburgh in 1927—a meeting which coincided with the celebrations in Edinburgh of the centenary of the birth of Lister—he acted as a vice-president of the Section of Surgery.

Outside his profession Mr. Struthers had many interests and many friends. He was a man of broad culture, widely read, fond of music, and in his later years devoted to gardening. He had a highly critical mind and was intolerant of the second-rate or of any form of humbug, but he was always more critical of his own work than of that of others. Possessing a remarkable faculty for graphic verbal description, he could give highly entertaining thumb-nail sketches of his colleagues and others. He took great trouble in the preparation of his clinical lectures and was a stimulating and popular teacher in spite of, or possibly because of, his occasional caustic comments. As an examiner he was very searching and skilful in assessing the knowledge of the candidate, but in marking tended to be generous rather than otherwise. In his younger days he was good at most games and was a notable golfer: he won the Argyll Robertson medal—a scratch medal competed for annually by the Fellows of the two Royal Colleges in Edinburgh—no fewer than ten times. On the golf course, and also in hospital and the Students' Union, he was commonly known as "Jock" Struthers, and this name is a good indication of the affection with which he will be long remembered by those who knew him.—W. Q. W.

G. S. PARKINSON, C.B.E., D.S.O., M.R.C.S., D.P.H.

We record with regret the death on August 18 of Brigadier George Parkinson at the age of 72. He served with distinction in three wars, and in the nineteenth-thirties was a well-known and popular figure at the London School of Hygiene and Tropical Medicine, where he was assistant director of the public health department, vice-dean, and, later, dean for a short period.

George Singleton Parkinson was born in 1880 and educated at Bath College. At the beginning of the South African War he volunteered for service and gained the Queen's medal and five clasps. When he returned to this country he became a medical student at Bristol, qualifying in 1906. Two years later he entered the R.A.M.C. Developing an interest in hygiene, he took the D.P.H. in 1913, and during the first world war he served in France and Belgium on the headquarters staff of the First Army. Mentioned in dispatches three times, he was awarded the D.S.O. in 1918. The French Government decorated him with the Croix de Guerre

and the Médaille de la Reconnaissance, and he was also appointed Chevalier of the Order of St. Avis. After the war he was medical officer of health at Gibraltar for four years and then returned to the Royal Army Medical College, Millbank, as assistant professor of hygiene. In 1928 he retired from the R.A.M.C. with the rank of lieutenant-colonel, and shortly afterwards joined the staff of the London School of Hygiene and Tropical Medicine as assistant director of the public health division, then being built up by Dr. (later Sir Wilson) Jameson.

Parkinson's geniality and kindness—qualities which perhaps obscured but far from blunted his shrewdness and powers of observation—won him a great number of friends among the students and staff at the school. He was an ideal adviser to young postgraduates anxiously in search of a career, and the trouble he took in dispersing their doubts and difficulties was repaid by the affection in which he was held by all whom he had helped. He had a great regard for the world-famous school with which he had linked his fortunes, and watched its reputation grow with affectionate loyalty. When in 1940 Sir Wilson Jameson became Chief Medical Officer at the Ministry of Health Parkinson was very proud of the honour of being chosen to act as dean, an office which he held until he returned to the R.A.M.C. in 1943. Those who were present in 1950 at a dinner in the Savoy Hotel given in honour of Sir Wilson Jameson and Brigadier Parkinson will remember how moved Parkinson was by the sincere tribute which was then paid to him by students who took the D.P.H. course at the London School of Hygiene between the years 1929 and 1939.

Parkinson had previously been re-employed by the Army for a short time at the beginning of the war in 1939 as director of hygiene in the Eastern Command, but in 1943 he was appointed director of the Public Health Subcommittee of the Allied Military Government in North Africa with the rank of brigadier, and he served later in Sicily and Italy in the same capacity. For his services he was appointed C.B.E. in 1945. He was awarded the Typhus Commission Medal (U.S.A.) in 1944 and the Croce del Merito of the Italian Red Cross in 1947. For some months in 1951 he acted as technical adviser to the Greek Government in Athens.

Parkinson's name was well known in the public health world both for his work at the London School of Hygiene and as co-author with Sir Wilson Jameson of the popular *Synopsis of Hygiene* from its third to its ninth editions. He was a lecturer in public health at the London School of Medicine for Women and an examiner for the D.T.M. and H. of the Conjoint Board. An honorary life member of the British Red Cross Society, he was the author of the Society's *Manual of Hygiene and Sanitation*, and he was also a Commander of the Order of St. John of Jerusalem. In recent years Parkinson took an active part in the work of the Foot Health Educational Bureau.

In 1911 he married Hilda, daughter of the late Thomas Chisholm Jack, of Edinburgh. There were no children of the marriage.

G. S. E. writes: The sudden death of Brigadier Parkinson will have been a sorrowful shock to the wide circle of friends who have been associated with him in his varied activities. I met him first in 1917 in France when as deputy assistant director of hygiene on the staff of the First Army he was the helpful adviser of many civilians who, like myself, had been commissioned to the R.A.M.C. sanitary sections. Even in those days he had decided that on his retirement from the

Army he would attach himself in some way to the public health service; so as a step in that direction he welcomed his appointment at the end of the war to the military post of M.O.H., Gibraltar. After retiring from the R.A.M.C. he served for some time as assistant secretary in the office of the Society of Medical Officers of Health, in which capacity he made himself familiar with problems of public health administration. He was a foundation member and the first honorary secretary of the Society's Services Group (then known as the Navy, Army, and Air Force Hygiene Officers Group). Before long his merits were recognized by his appointment as assistant dean of the London School of Hygiene and Tropical Medicine. In this congenial post his genius for friendship made him a valuable influence in creating among successive generations of students from all parts of the Empire a loyal pride in their membership of the school. The preceding obituary notice records Parkinson's distinguished military services. My desire has been to pay tribute to the devoted and unselfish co-operation given by him during nearly 40 years to all those engaged in public health work. Above all, "Parky" deserves to be remembered with affection for years to come by many who have enjoyed his unfailing good fellowship.

Dr. ROBERT LOVE BLAIR died at his home at St. Annes-on-Sea on July 15, in his 56th year. Born in 1897, he was educated at Giggleswick School and at Liverpool University, where he graduated M.B., Ch.B. in 1923. After acting as a house-surgeon at the David Lewis Northern Hospital, Liverpool, he entered general practice at St. Annes, where his father was already a well-known practitioner, and was appointed honorary surgeon to the St. Annes War Memorial Hospital. Dr. Blair was hard-working and conscientious to a degree, and was devoted to his patients and they to him. It was said that he bore their burdens for them, and there is no doubt that his zeal on their behalf contributed largely to the series of illnesses which culminated in his death. He found time, however, for other interests. He played Rugby for the Fylde club, and he was a keen golfer and an ardent follower of cricket. He took great interest in local youth clubs and was a past-president and chairman of the local Y.M.C.A. A courteous and kindly man, he was a good doctor and will be greatly missed.—D. K. L.

The medical profession in Hull has lost one of its most loved and respected members by the death on July 24 of Dr. G. F. BRIGGS at the age of 81. George Frederick Briggs was born on October 8, 1871, and after studying medicine at Cambridge University and at St. Bartholomew's Hospital qualified in 1898. He held several house appointments before settling in practice with his father, a well-known general practitioner in Hull and a member of the city council. Dr. Briggs was one of those family practitioners to whom patients turned for help in all kinds of trouble. His opinion as an experienced practitioner was always valued by those who knew him most intimately, though he was a diffident speaker in public. One of his many endearing characteristics was a very gentle sense of humour. During the last war, when he was already turned 70 and when house-surgeons were difficult to get, he came to assist as an anaesthetist at the Children's Hospital. One morning he arrived looking particularly cheerful, and when this was remarked on he said: "I have just come from seeing an old lady of 95 who has been a patient in our practice, my father's and mine, since well back into the last century. Her daughter, herself quite an elderly woman now, received me and shouted into her mother's ear, 'Mother, this is young Dr. Briggs come to see you.'" He was a deeply religious man and a much respected office-bearer in his church for a great many years, but there also he was always humble and unassuming. The high esteem in which he was held was evidenced by the large number of medical men who contrived to attend the funeral service at an hour when most are usually busy. The sympathy of all his colleagues will go out to his widow and the family of two daughters and three sons, one of whom is practising medicine.—T. R. R.

Dr. MABEL CATHARINE POULTER, who died on July 31 at the age of 89, was for many years a medical missionary in China and India. She was born on October 30, 1863, and was educated at Queen Margaret College, Glasgow, and at Glasgow University, where she graduated M.B., Ch.B. in 1898. In the following year she began her work at Hoki-chiang (now Futsing), in the Fukien province of China. Futsing is a small city some sixty miles south of Foochow, and when Dr. Poulter arrived there the local people were very distrustful of foreigners and she had an uphill task. At the China Medical Conference in 1915 Dr. Poulter read a paper outlining her obstetric experiences in Futsing. When she first went to China she found the methods used to assist a birth crude in the extreme and dangerous to the health of mother and child. It was not until 1902 that women were persuaded to enter the hospital at Futsing for confinement, and then only four responded to the invitation. But the annual intake increased gradually until in 1913 the number of hospital confinements was 247. In 1921 the medical mission at Futsing was handed over to the American Methodist Episcopal Mission, and it was with great regret that Dr. Poulter relinquished her work there. In twenty-three years she had built up an excellent hospital, putting to the best possible use such equipment as she could obtain and using her ingenuity to devise gadgets in place of equipment which could not be provided. The handicaps she overcame would have seemed insuperable to most people, but Dr. Poulter had a vigorous and vital personality and would never have thought of giving in. She was a fine teacher and did great work in making the nursing profession acceptable to the girls and women of China. On leaving Futsing she returned to England for a time, but in 1925 she went out to India, working first at the Church of England Zenana Hospital at Bangalore. She continued to work at a number of hospitals in various parts of India until 1934, when she retired from active medical practice.

The death on August 10, after a short illness, of Dr. F. W. MORTON PALMER at the age of 76 removes one of the older generations who, despite his modesty and instinct for self-effacement, had exercised no little influence in both medical and lay circles in Devonshire. He inherited a medical tradition extending over a quite exceptional number of generations, the medical members of which all looked to Guy's Hospital as their alma mater, and he naturally took the same direction, via Merchant Taylors' School and Jesus College, Cambridge, to both of which he won scholarships. But before beginning his medical studies he took an honours degree in mathematics, being 36th wrangler in 1899. At school he had "sat at the same desk" in mathematics with his friend James Jeans (later Sir James Jeans, the astrophysicist), and they entered Cambridge together, pursuing the same subject. Morton Palmer then turned to the study of medicine and took the Cambridge M.B., B.Chir. degrees in 1905, proceeding to the M.D. in 1909. After graduating in medicine, he held the appointments of house-physician and ophthalmic house-surgeon at Guy's Hospital and clinical assistant to out-patients at the Evelina Hospital for Sick Children. In 1905 he was the editor of *Guy's Hospital Gazette*. He settled in general practice at Teignmouth in 1907 and remained there for thirty years, becoming a leading figure in the life of the town. His work there was interrupted by service as a captain in the R.A.M.C. with No. 1 Casualty Clearing Station in the first world war. In 1937 he retired to live at Totnes and thus became free to pursue intensively his work in the Order of St. John, which he had taken up twenty years previously. From 1939 to 1945 he was the county casualty officer for civil defence; he then organized the hospital car service for Devon, and in 1947 he became county commissioner of the St. John Ambulance Brigade. His services were recognized officially in 1952, when he was promoted to Knight of the Order of St. John of Jerusalem. He was an honorary life member of both the British Red Cross Society and the St. John Ambulance Association. In addition, he gave valuable, unremitting service for many years on a number of com-

mittees, such as the board of the Royal Devon and Exeter Hospital, to which he was nominated by the Exeter Division of the British Medical Association, and later on the management committee of the Royal Western Counties Institution. He was chairman of the house committee of Totnes Hospital at the time of his death, which took place in the hospital. Morton Palmer was an active member of the B.M.A. He was chairman of the Exeter Division in 1930-1; in 1937 he was elected president of the South-western Branch; and from 1941 to 1950 he was chairman of the Torquay Division. He also represented his Division at the Annual Representative Meeting in 1942. The Torquay Medical Society, too, valued his services, and for a time he was its president. In all these activities he was recognized by all with whom he came in contact as the wise counsellor, possessing as he did exceptional clarity of mind and unhurried judgment; and his remarks, though always brief and quiet, in revealing those qualities necessarily carried weight. In private life he was a Fellow of the Society of Antiquaries and a prominent authority on church architecture. His wife died in 1937, just after his retirement from general practice, and he leaves a son, Dr. B. C. Morton Palmer, who is in practice at Cophorne, Sussex, and a daughter, who was closely associated with him as assistant in all his work and to whom, therefore, in particular the deep sympathy of all must go out.—F. A. R.

Universities and Colleges

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

P. J. MacCarthy has been approved at the examination for the degree of M.D.

The following medical degrees were conferred on July 2:

M.B., B.Ch., B.A.O.—S. Baigel, N. J. Ball, Freda B. Bonner, J. H. C. Colquhoun, D. G. Crawford, Ouida M. S. d'Abreu, J. McN. Fullerton, Joyce M. Fullerton, D. V. Furlong, Margaret E. E. Graham, Lilian G. N. Hanbridge, Mary M. Heaf, R. F. B. Howarth, M. Jeffries, G. A. C. Keenan, B. E. Kendall, Beulah R. Knox, C. J. Lidstone, U. D. B. H. Longford, D. A. Lyder, Margaret E. McMullin, Kathleen M. MacWilliam, D. M. McWilliams, H. G. S. Medlicott, J. C. Milliken, J. M. Kingsmill Moore, N. A. J. Mullen, Edna La C. Murphy, P. H. Osterberg, Peadar O'Toole, P. Panayotou, J. A. R. Pollock, G. P. Pretorius, S. E. J. Ross, R. J. W. Ryder, E. J. Stales, Sheine M. Schwartzberg, J. F. Scott, W. J. C. Stevenson, Patricia A. Throup, F. L. A. Townshend, C. E. H. Treston, Sylvia L. E. Tyler, A. E. Vercueil, Dorothy C. Williamson.

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examinations indicated:

M.D.—Muriel I. R. Knox, N. P. Lancaster, B. J. Leonard (with commendation), H. Weisl (with commendation).

Ch.M.—G. K. Tutton.

FINAL M.B., Ch.B.—J. R. A. Mitchell (with honours and distinction in medicine), G. W. Ashcroft, E. L. Barrett, M. L. Bishop, A. D. Clift, R. L. Cumming, Sheila P. Dain, G. S. Davis, D. Dean, L. S. Deane, H. T. Fay, E. J. H. Foster, R. P. Gannon, Molly Gibson, D. Goldsborough, A. H. Gowenlock, A. J. Gurtler, Kathleen C. Hall, Anne P. Hollins, K. S. Holmes, G. Hopkinson, B. G. Howarth, Mary P. H. Jepson, D. A. J. Keen, B. V. Lee, Joan M. Leeming, A. L. Levy, Elizabeth U. Macgregor, Sheila M. Mackridge, Inez R. Mendelson, P. Mulvey, Jean Oldham, D. J. Parish, R. Pell-Ilderton, J. Perkins, L. Proger, B. Prendergast, J. H. Price, Barbara A. Renwick, R. B. Rosenberg, Daphne J. Savage, J. A. Southam, Elizabeth M. Thomas, R. R. Thomas, Mary Timperley, June A. Vaux, Sheila Wightman, D. Wild, D. Wilde, W. K. Willan, T. H. Williams.

UNIVERSITY OF WALES

In Congregation on July 18 the following degrees were conferred:

M.B., B.Ch.—W. H. Allen, Jane I. K. Binnie, P. A. C. Bootman, N. P. Braun, W. G. Brown, D. L. Crosby, Marian H.

Dadaczynski, A. B. David, D. R. Davies, S. L. Davies, Joan M. Evans (with commendation), L. T. I. Evans, H. J. Grosz, Margaret J. Hicks, R. M. Hodges, D. R. Hughes, H. J. Hughes, J. H. Hughes, J. A. Hutchison, G. A. S. Ireland, J. F. C. Jacobs, D. S. Jones, J. T. Jones, W. P. T. Kime, W. J. Manson, Valerie Matthews, Dilwyn C. Morgan, J. G. Morgan, J. E. Morris, R. A. Owen, Glenys O. Parry, E. E. Payne, H. A. Rees, I. D. G. Richards, J. M. Richards, A. G. Roberts, Denise Y. Sheppard, J. W. G. Smith, W. G. C. Strawbridge, J. R. Tighe, D. B. M. Williams.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College held on July 30, with the President, Sir Russell Brain, in the chair, the following Fellows of the College were elected officers for the ensuing year: *Censors*, K. E. Harris, F. P. Lee Lander, J. R. H. Towers, T. C. Hunt; *Treasurer*, W. G. Barnard; *Registrar*, Sir Harold Boldero; *Harveian Librarian*, E. C. Dodds, F.R.S.; *Assistant Registrar*, M. I. A. Hunter.

Sir Charles Symonds was appointed Harveian Orator and Dr. F. H. K. Green Bradshaw Lecturer, both for 1954. The following lecturers were also appointed: Lumleian (1954), Professor D. M. Dunlop; Goulstonian (1954), Professor A. W. Woodruff; Oliver-Sharpey (1954), Professor M. L. Rosenheim; Mitchell (1954), Dr. J. L. Livingstone; Bertram Louis Abrahams (1954), Professor E. B. Verney, F.R.S.; Langdon Brown (1954), Dr. E. F. Scowen; Croonian (1955), Sir Horace Evans; Fitzpatrick (1955), Dr. C. E. Newman; Watson Smith (1955), Dr. G. B. Dowling.

The Baly Medal for 1953 was awarded to Dr. K. S. Lashley for his services to physiology and for his work on the localization of function in the brain.

The Bisset Hawkins Medal for 1953 was awarded to Dr. W. N. Pickles for his study, while in general practice at Aysgarth, of the epidemiology of a rural community.

Sir Russell Brain was reappointed the College representative on the governing body of the British Postgraduate Medical Federation.

Membership

The following candidates, having satisfied the Censors' Board, were admitted Members of the College: C. P. T. Alexander, M.B., Joan Angus, M.B., B. H. Bass, M.D., Lieutenant, R.A.M.C., M. Bodian, M.D., B. A. Bradlow, M.D., D. G. Campbell, M.B., H. Cohen, M.B., D. G. Cottom, B.M., S. R. A. Dodu, M.B., M. L. Doran, B.M., A. C. Fairburn, M.B., Lieutenant, R.A.M.C., A. G. Freeman, M.D., A. S. Grimble, M.D., N. A. J. Hamer, M.B., R. Hill, M.B., J. P. T. Jaywardena, M.B., I. A. Kellock, M.D., T. C. K. Marr, M.B., F. J. Meagher, M.B., D. Mendel, M.B., Ruth D. Revill, M.D., J. R. Roberts, M.B., Sylvia M. Saddington, M.B., M. H. Sheard, M.B., H. C. Smellie, M.B., J. D. Tange, M.B., P. P. Turner, M.D.

Licences

Licences to practise were conferred upon 112 candidates (including 23 women) who have passed the final examination in medicine, surgery, and midwifery of the Conjoint Board and who have complied with the by-laws of the College: J. E. Ambrose, P. D. Arnold, P. J. Atkinson, A. A. Azie, Barbara E. G. Bapty, P. A. Barker, K. E. Barrett, N. L. Beisly, P. B. Biddell, C. E. S. Bill, E. D. Bird, B. Black, S. B. Boyle, M. Bray, A. M. Brill, J. R. Brook, Jane Buchanan, Pamela M. Butcher, V. G. Caiger, J. L. H. Capper, B. W. Cole, B. E. Cooke, S. Cooklin, A. G. Cope, I. D. Craig, H. R. Dickman, A. W. T. Eade, Helen W. East, B. I. F. Eminson, N. O. Eve, H. T. Fay, K. W. Giles, J. A. M. Goodwin, M. V. Gruchy, Jean L. Harney, J. A. Harrison, Pamela M. Harrison, B. D. Hick, Sheila M. Hindle, J. M. Hughes, D. S. Hutton, P. T. Jackson, Verna S. James, P. O. Jones, H. McP. Kidd, K. C. King, Margaret A. King-Davies, Solange M. M. Labesse, Pamela F. Lind-Smith, J. S. Lloyd, I. L. Loch, Gillian A. J. Lomax, D. B. Longmore, R. L. J. Lovick, G. P. Lowther, J. R. McNeill, D. I. Macpherson, Angela M. M. Manning, N. W. Marshall, G. F. Mayall, R. L. Meyrick, Audrey Millar, Evelyn J. Mitchell, J. B. Montgomery, W. K. C. Morgan, B. K. A. Muller, P. T. Nicholas, Sheila Nourse, R. E. Onwumere, G. Parkes, A. F. W. M. Pooler, A. T. Porritt, T. B. Priestley, C. Protheroe, Margaret J. Purser, C. O. Quarcoopome, Priscilla A. Ridge, D. P. W. Roberts, G. S. Roberts, G. F. C. Rosser, R. Routledge, J. W. Scopes, H. G. Scott, F. E. Shaw, Eileen M. Shuttleworth, M. Singh, G. F. Slocumbe, F. E. Sparshott, Elizabeth J. Steele, G. R. Stevenson, E. L. Stout, R. J. Sturt, C. Sumner, C. K. Sutcliffe, J. E. Taylor, S. H. Taylor, H. T. Thomas, A. D. Thursz, Naomi Turner, D. W. Warrell, Dorothy A. Wescott, J. T. Wheeler, L. Wilkinson, C. A. Williams,

Jennifer M. T. Williams, G. C. E. Wilson, P. M. Wine, J. R. Wood, N. W. Wood, S. M. Worrall, R. W. P. Yates, W. O. C. Young.

Diplomas

Diplomas in Anaesthetics, in Child Health, in Laryngology and Otology, in Medical Radiodiagnosis, in Medical Radiotherapy, in Pathology, in Psychological Medicine, and in Tropical Medicine and Hygiene were granted jointly with the Royal College of Surgeons of England to the successful candidates whose names were printed in the report of the meeting of the Royal College of Surgeons of England held on July 9 (*Journal*, August 15, p. 400).

Diplomas were granted, jointly with the Royal College of Surgeons of England, to the following successful candidates:

DIPLOMA IN INDUSTRIAL HEALTH.—R. Bradley, G. R. Holtby, H. Mowschenson, R. Whitelaw.

DIPLOMA IN OPHTHALMOLOGY.—I. Ali, Doreen A. Birks, F. H. Budden, B. C. Dench, R. L. Douglas, S. M. Drancz, S. F. El-Jarrah, O. O. F. Fooks, Ann Garratt, S. Gebert, G. L. Harper, Joan M. Hickley, T. K. Howat, H. Jackson, R. F. Jones, T. G. Jones, W. T. Levy, Aileen B. MacClancy, R. J. McWilliam, A. Majid, M. S. Nirankari, P. K. Ray, A. T. Ryan, S. M. Sadig, H. J. Scott, Winifred A. Sterndale-Bennett, Faye V. Tallack, R. E. Tingey, Sheena E. Tompkins, G. A. O'Reilly.

DIPLOMA IN PHYSICAL MEDICINE.—J. B. Millard, J. E. F. Perera, A. C. Pinkerton.

DIPLOMA IN PUBLIC HEALTH.—A. R. Basu, J. Belej, S. G. Gordon, Louise M. E. Hogg, Dorothea Koffman, C. R. A. Martin, I. H. C. Morton, R. D. Pearce, J. D. Pickford, Eleanor M. Sawdon, A. K. Sen, J. A. Slattery, W. R. Waldron, W. Wollen.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College on July 30, with Sir Cecil Wakeley, President, in the chair, Dr. W. D. M. Paton was appointed Professor of Pharmacology, and Dr. Joseph Bamforth Research Pathologist in the College.

Dr. George Crile, jun. (Cleveland Clinic, U.S.A.) was awarded a Moynihan Lectureship.

Mr. J. J. Jones (King's College Hospital) was awarded the Hancock Prize.

Diplomas were granted, jointly with the Royal College of Physicians of London, in Public Health, in Ophthalmology, in Industrial Health, and in Physical Medicine to the successful candidates whose names are printed above in the report of the meeting of the Royal College of Physicians of London on July 30.

Hospitals were recognized under paragraph 23 of the F.R.C.S. regulations as follows: General Infirmary, Burton-on-Trent, revision, resident surgical officer and house-surgeon for six months; for *casualty training*, casualty officer for six months. Southern Hospital, Dartford, paragraph 23c, senior house officer, ear, nose, and throat. Queen Elizabeth Hospital, Gateshead, house officer (casualty) to be recognized for six months' casualty training and not, as hitherto, for general surgery. Western District Hospital, Glasgow, redesignation, surgical registrar has now become senior house officer; for *casualty training*, junior hospital medical officer (casualty), for six months. Hertford County Hospital, surgical registrar for twelve months; two house-surgeons, each for six months. Western General Hospital, Hull, senior house officer and junior house officer, both for six months; registrar for six months. Royal Northern Hospital, London, for *general surgery*, resident surgical officer for twelve months; two house-surgeons for six months; for *casualty training*, senior casualty officer for six months; two casualty house-surgeons for six months; for *unspecified training*, orthopaedic house-surgeon for six months. West Kent General Hospital, Maidstone, revision, two house-surgeons for six months; for *casualty training*, casualty officer for six months. Norfolk and Norwich Hospital, revision, for *general surgery*, senior surgical registrar for twelve months; two general surgical registrars for twelve months; two general house-surgeons for six months; for *casualty training*, senior casualty officer for six months; for *unspecified training*, house-surgeon to orthopaedic department for six months. West Norwich Hospital, additional recognition, general surgical registrar for twelve months. Pontefract General Infirmary, for *casualty training*, casualty officer for six months. King's Mill Hospital, Sutton-in-Ashfield, resident surgical officer (registrar) for six months. Hallam Hospital, West Bromwich, decennial revision, surgical registrar for twelve months; two house-surgeons for six months.

A name in the list of recipients of the Diploma in Laryngology and Otology printed in the *Journal* of August 15 (p. 400) was misspelt: S. Sytcha should read S. Sychta.

Vital Statistics

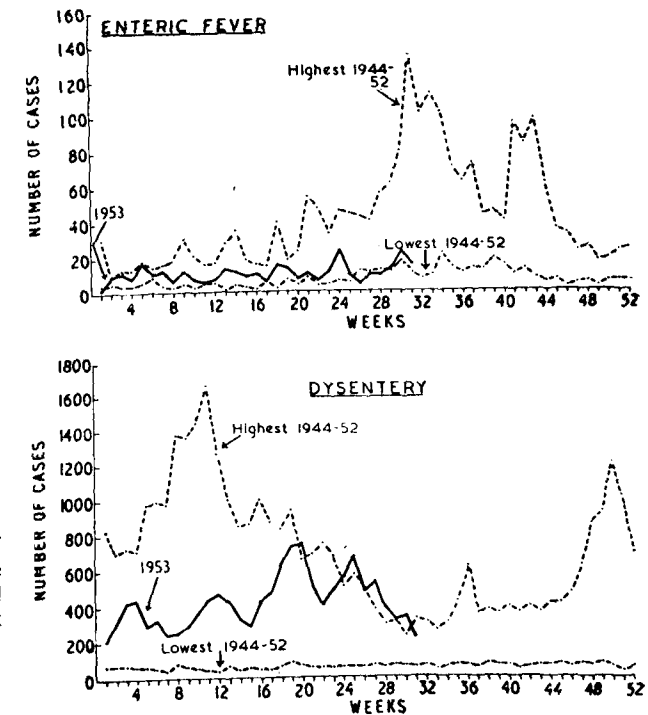
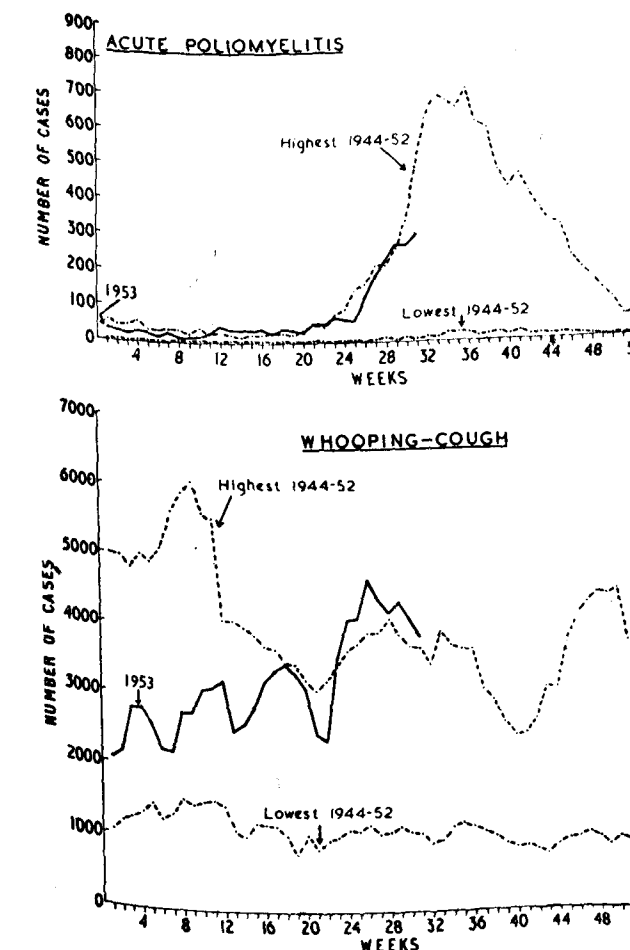
Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending August 15 (32nd week of the year) were as follows: paralytic, 186 (181); non-paralytic, 132 (116); total, 318 (297). This is an increase of 21 compared with the previous week, the figures for which are in parenthesis. The individual districts which have notified 20 or more cases in the year to August 15, with incidences per 100,000 in parenthesis, are as follows: Southend-on-Sea C.B., 42 (27.85); Liverpool C.B., 45 (5.69); Birmingham C.B., 50 (4.47); Coventry C.B., 97 (37.16); Leicester C.B., 28 (9.79); Lewisham M.B., 24 (10.57); Blackpool C.B., 22 (14.94); Camberwell M.B., 20 (11.04); Islington M.B., 22 (9.35); Bournemouth C.B., 29 (20.87); Bristol C.B., 20 (4.51); Nottingham C.B., 21 (6.76); Taunton M.B., 24 (69.36); St. Pancras M.B., 21 (15.04).

There was little change in the momentum of the seasonal rise during the 32nd week. The increase in the number of paralytic cases notified was 5 only. In recent years the zenith has been reached in the following weeks: 1952—33rd week; 1951—29th week; 1950—34th week; 1949—41st week; 1948—39th–41st week; and 1947—36th week.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944–52 are shown thus ———, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

A fall was recorded in the number of notifications of infectious diseases in England and Wales during the week ending August 8. The largest decreases were 857 for measles, from 3,587 to 2,730; 260 for scarlet fever, from 950 to 690; 243 for whooping-cough, from 4,107 to 3,864; and 117 for dysentery, from 334 to 217.

A decline in the incidence of measles was recorded in every area of the country; the largest fall in the number of notifications was 210 in Lancashire, from 671 to 461. The largest falls in the notifications of whooping-cough were 89 in Yorkshire West Riding, from 321 to 232; 80 in Essex, from 442 to 362; and 66 in Staffordshire, from 112 to 46; while the only large rise was 76 in Kent, from 187 to 263. A small fall in the number of notifications of scarlet fever was recorded throughout the country; the largest decline was 61 in Lancashire, from 139 to 78. 22 cases of diphtheria were notified, 11 more than in the preceding week. The chief feature of the returns of diphtheria was a rise in Lancashire from 2 to 7.

For the second consecutive week 3 cases of paratyphoid fever were notified in Worcestershire, Martley R.D.

297 cases of acute poliomyelitis were notified during the week, and these were 14 more for paralytic and 13 more for non-paralytic cases than in the preceding week. The largest returns were London 34 (Greenwich 5, Islington 5); Essex 22 (Southend-on-Sea C.B. 3); Warwickshire 21 (Coventry C.B. 10, Birmingham C.B. 6); Lancashire 20 (Liverpool C.B. 4, Blackpool C.B. 3); Kent 18 (Dartford M.B. 3); Somersetshire 17 (Taunton M.B. 5, Yeovil R.D. 3); Sussex 14; Surrey 13; Yorkshire West Riding 11 (Sheffield C.B. 4); Southampton 10 (Bournemouth C.B. 3, Portsmouth C.B. 3).

The largest returns for dysentery were Yorkshire West Riding 30 (Bradford C.B. 10); Lancashire 29 (Liverpool C.B. 11); Middlesex 24; London 23; Surrey 19.

The largest outbreak of food-poisoning reported during the week was Southampton County (Winchester M.B. 133).

Week Ending August 15

The notifications of infectious diseases in England and Wales during the week included scarlet fever 488, whooping-cough 4,681, diphtheria 22, measles 2,123, dysentery 217, paratyphoid fever 10, typhoid fever 10, and food-poisoning 389.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending August 8 (No. 31) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	22	1	4	1		19	0	11	0	
Dysentery ..	217	23	74	3		93	13	52	2	2
Encephalitis, acute..	4	0	0	0		8	0	0	0	
Enteric fever:										
Typhoid ..	3	1	1	0		5	1	0	0	
Paratyphoid ..	12	0	1(B)	0		130	2	2(B)	0	
Food-poisoning ..	415	24		1		164	9		9	
Infective enteritis or diarrhoea under 2 years ..				14	33				19	30
Measles*	2,730	50	43	75	75	7,309	944	55	78	268
Meningococcal infection ..	24	0	9	2	1	20	2	10	0	
Ophthalmia neonatorum ..	32	0	5	0		34	4	20	1	
Pneumonia†	235	11	114	4		227	13	107	2	
Poliomyelitis, acute:										
Paralytic ..	181	16	15	8	11	139	15	15	11	7
Non-paralytic ..	116	18								
Puerperal fever‡	12	0	10	0	1	227	40	12	3	1
Scarlet fever ..	690	40	107	19	28	997	85	98	20	42
Tuberculosis:										
Respiratory ..			109	12				96	36	
Non-respiratory..			25	3				29	3	
Whooping-cough ..	3,864	349	430	55	48	2,042	110	116	60	127

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	1	0		0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	7	1	2	0	0	6		5	1	3
Influenza ..	0	0	0	0	0	0	0		0	0
Measles ..		0	0	0	0		1		0	0
Meningococcal infection ..		1	0				0			
Pneumonia ..	123	9	14	14	6	123	13		5	7
Poliomyelitis, acute	14	1			0	10	1			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis:										
Respiratory ..	78	7	11	1	5	95	16	9	1	5
Non-respiratory..										
Whooping-cough ..	2	0	0	0	1	1	0		0	2
Deaths 0-1 year ..	193	15	24	6	10	185	27	23	6	21
Deaths (excluding stillbirths) ..	4,208	598	502	103	161	4,099	611	440	87	134
LIVE BIRTHS ..	7,414	1,153	872	202	336	7,860	1,178	888	230	385
STILLBIRTHS ..	185	20	28			175	21	23		

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

Medical News

Supply of Cortisone and A.C.T.H. to Hospitals.—The Ministry of Health has informed certain hospitals in England and Wales of forthcoming changes in the scheme of distribution made possible by improved supplies of cortisone and corticotropin (A.C.T.H.). A substantial part of the additional amounts of these hormones which will become available from the beginning of September is to be reserved for patients suffering from diseases in which these hormones may prolong life. Conditions so far included in this "obligatory maintenance" category are: adrenal deficiency (Addison's disease, post-adrenalectomy state, etc.); pituitary deficiency (Simmonds's disease, etc.); lupus erythematosus (systemic forms); polyarteritis nodosa; pemphigus; exfoliative dermatitis; and sarcoidosis. Supplies of cortisone and corticotropin for the treatment of patients suffering from the above conditions will be available only through the hospitals which receive regular monthly allocations, and inquiries should be addressed to these hospitals. The hormones cannot be sent either direct to doctors or to hospitals not included in the Ministry's list.

Memoirs on Endocrinological Subjects.—The Society for Endocrinology has issued the first of a series of periodical memoirs on endocrinological subjects. It is on "The Thyroid Gland," and is a record of a conference held in London last February jointly by the Society and the Endocrinological Section of the Royal Society of Medicine. Copies of the memoir may be obtained from Pitman Publishers, Parker Street, London, W.C.2, price 5s.—3s. to members of the Society (postage extra). The new series will be used for publishing proceedings of the Society's conferences, special reviews, or other material for which separate publication is desirable. The main object is to effect speedy publication in subjects which are being rapidly transformed by current research.

Family Doctor.—"Back to School" is the theme of a special section in the September *Family Doctor*. In the medical section there are articles on the obsessional personality, swollen ankles, and poliomyelitis. There is advice on preparing for breast-feeding, and the series on "How Your Life Began" is continued.

COMING EVENTS

International Paediatric Congress.—The seventh International Paediatric Congress is to be held in Havana, Cuba, from October 12 to 17. The main subjects for discussion at the conference will be "Epilepsy in Infancy and Childhood," "Diagnosis of Congenital Malformations of the Heart and Great Vessels Susceptible of Surgical Treatment," "Problems of the Premature Infant," "Complications of Primary Tuberculosis," and "Metabolism and Nutrition Problems." Those wishing to attend the meeting are requested to inform the Organizing Committee of the Congress, Hospital Mercedes, Vedado, Havana, Cuba, as soon as possible.

NEW ISSUES

Archives of Disease in Childhood.—The next issue (Vol. 28, No. 140) will be available in a week's time. Issued bi-monthly; annual subscription £3 3s., single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Chadwick.—On August 3, 1953, at the Withington Hospital, Manchester, to Sybil, wife of Dr. David Chadwick, a son.
Hennessy.—On August 1, 1953, at the Keresley Branch, Coventry and Warwickshire Hospital, to Doris (formerly Drewry), wife of J. D. Hennessy, M.Ch., F.R.C.S., a second daughter—Karen Amy.
Parker.—On August 10, 1953, at the Birmingham Maternity Hospital, to Barbara (formerly Owens), M.B., B.S., D.A., and Bernard Parker, M.R.C.O.G., a second son.

DEATHS

Badger.—On July 30, 1953, at Edinburgh Royal Infirmary, Charles William Badger, M.B., Ch.B., of Carnethy, Penicuik, Midlothian.
Day.—On July 30, 1953, at Edinburgh, Charles Lionel Day, M.B., B.Ch., B.A.O., D.P.H., Lieutenant-Colonel, R.A.M.C.

Any Questions?

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

Fats and Atherosclerosis

Q.—What are the therapeutic implications of recent work showing a relationship between certain serum lipo-proteins and atherosclerosis? Should the management of cases of coronary disease be altered to take account of this work?

A.—For a long time it has been known that there is a loose relationship between a high blood cholesterol and atherosclerosis, but the blood cholesterol could not be lowered by means of a low-fat diet. Thus in cases of coronary disease in which a high blood cholesterol was demonstrated there seemed little point in advising a low-fat diet. The work of John Gofman, however, has thrown a new light on the problem, for he has shown that it is not cholesterol *per se* that matters, but certain large fat molecules which may be separated out by means of the ultra-centrifuge. He and his colleagues have further established that the amount of these large fat molecules in the blood can be lowered appreciably by means of a fat-free diet. Thus there is now some scientific evidence to justify advising patients with coronary disease to adopt such a diet, although statistics have not yet demonstrated that a low-fat diet does in fact improve the prognosis of coronary disease.

Passive Immunity in Infants

Q.—Against which of the common infectious diseases is an infant protected by maternal antibodies transmitted through the placenta, and for how long does such immunity generally last? Does this protection depend on the mother having had the disease in question?

A.—It is common knowledge that specific infectious diseases like scarlet fever and diphtheria among bacterial infections, and measles, mumps and chicken-pox among virus infections, rarely occur in the first six months of life; and this phenomenon is attributed to the passive transfer of antibody from mother to child via the placenta. Most of our precise information about passive immunity comes from studies on the presence and amount of diphtheria antitoxin in the blood of mothers and their newborn offspring; these studies have shown that the level of antitoxin in the infant's blood at birth is at least as high as that of the mother's. The antitoxin disappears at a regular rate from the infant's blood (it is reduced to half its previous level approximately each month), and the time of its final disappearance naturally depends on the initial concentration; ordinarily it ceases to be demonstrable after three to four months. Thus this temporary immunity of the child is dependent on the presence of antibody in the mother's blood and presumably the same holds good for other infections. Antibody is most likely to be present in the mother's blood following a clinical attack of a systemic infection like measles, or repeated subclinical attacks as probably occurred in diphtheria when this disease was more prevalent. It is less likely to persist after more localized infections; for example, in whooping-cough the infection is mostly of the respiratory mucosa and antibodies probably do not persist into the adult life, since whooping-cough is one of the few specific infections that can occur early in infancy. It may be added that certain infectious diseases like infective hepatitis, poliomyelitis, and influenza rarely occur as typical clinical syndromes in infancy, but this may not mean that a child is insusceptible to infection by the agents of these diseases.

Intrathecal Penicillin

Q.—What is the recommended maximum dose of penicillin for intrathecal use in adults and in children? What risks attend exceeding these doses?

A.—20,000 units of penicillin is the maximum dose which can be given safely by lumbar puncture in the treatment of meningitis in adults, and the dose by cisternal or ventricular puncture should be smaller. This dose provides for concentrations in the C.S.F. which are above the level needed for inhibition of the pneumococcus for 24 hours, provided there is no leakage from the theca nor a subarachnoid block. In practice the usual intrathecal dose of penicillin is 10,000 units. Larger doses of intrathecal penicillin have been stated to cause convulsions and to increase the signs of meningeal irritation.

For children also the maximum dose should be 20,000 units; for babies and small infants 10,000 units. Crystalline penicillin is perfectly safe in these amounts, although smaller doses are generally adequate.

Vicarious Menstruation

Q.—Does vicarious menstruation really occur, and, if so, what are the commonest sites? What treatment is advised for it?

A.—Extragenital tissues cannot behave exactly as does endometrium, but some do occasionally bleed cyclically in relation to ovarian function, and in that sense vicarious menstruation is a real clinical entity. It is nevertheless rare, and this is particularly true of the substitutional type where the extragenital bleeding replaces uterine bleeding. Vicarious menstruation is mostly supplementary to uterine loss and takes the form of epistaxis in at least 30% of cases, the epithelium over the inferior turbinate bones being readily influenced by oestrogen. The commonest site after the nose is the alimentary tract, particularly the stomach. Other less common sites for bleeding are the lungs, breasts, gums and lips, kidneys, skin, retina, and conjunctiva. Vicarious menstruation is more likely to be seen at the two extremes of menstrual life and in hysterical and neurotic subjects.

It is always necessary to exclude a primary blood disorder and also a local organic cause for the haemorrhage. If none is found and unless the bleeding is heavy and uncontrollable, no special treatment is necessary. If the bleeding site is accessible—for example, the nose—cauterization is sometimes indicated. Empirical treatments advised include the administration of calcium and vitamin C or K. In very exceptional cases, as for example when retinal haemorrhages threaten sight, suppression of ovarian function might have to be considered.

Car Sickness in Small Children

Q.—What is the best way of preventing, and, if necessary, treating, car sickness in small children?

A.—Car sickness, like sea sickness and air sickness, may affect children at any age—even earliest infancy. Although there is undoubtedly a psychological element in many cases, its occurrence in infants shows that it has also an organic basis. Much of the success (and failure) of many of the remedies used is due to the psychological effect or approach. To judge of the real value of any remedy, therefore, its effect in early infancy must be assessed. On the whole, best results have followed the use of an antihistaminic. Dimenhydrinate ("dramamine"), promethazine hydrochloride ("phenegan"), and mepyramine maleate ("anthisan") have all proved extremely effective. Clearly they are better used prophylactically than therapeutically.

Treatment of car sickness involves stopping the car and allowing the child to get out in the fresh air. An open window or roof, attention to the exhaust system of the car

to ensure freedom from noxious fumes, equal and adequate pressure in the tyres, and care in cornering are all factors which may help in preventing car sickness. In older children reading while the car is in motion is sometimes responsible for nausea, which may proceed to emesis. Vomiting is less common when the child is sitting in the front seat. In the case of small children, if the journeys involved are short, the children should be allowed to stand on the seats and look out of the front windows. For long journeys, a good meal taken shortly before starting, together with a dose of anti-histaminic appropriate to the child's age, may be sufficient to promote drowsiness, and the journey may be begun with the child lying down comfortably on the back seat and going quietly to sleep.

Lice in Prison

Q.—As medical officer to a prison I am concerned with the problem of preventing the spread of lice of all varieties. Normally we expect to admit an average of three prisoners with pediculosis pubis daily plus a not always ascertainable number of cases of pediculosis corporis and capitis. We isolate these cases until treatment is complete. The present procedure with regard to prisoners' clothing is that all except blue suits goes through the steam disinfecter. The blue suits are sprayed with liquid D.D.T. and kept in a special room which is sprayed with D.D.T. daily. This is because the suits turn brown when treated in the steam disinfecter. Are these precautions adequate?

A.—Human body-lice spend nearly all their time on the undergarments, especially those next to the skin. Only in exceptionally heavy infestations is more than an occasional stray louse found on an outer garment such as a serge suit. It is therefore satisfactory to apply a residual insecticide, such as D.D.T., to the undergarments only; sooner or later the lice are bound to be contaminated.

The procedure described in the question appears quite adequate. However, several points call for comment: (1) The temperature required to destroy insect life is much lower than for many bacteria. The eggs of lice are killed by exposure to 54° C. for five minutes, or 50° C. for half an hour. Higher temperatures or longer exposures are, of course, necessary in practice, to allow the heat to penetrate the garments. Correct exposure could be determined by experiment and would almost certainly be below the level causing damage to blue suits. (2) "Liquid D.D.T." is presumably D.D.T. dissolved in kerosene. Neither in solution nor as a powder is D.D.T. lethal to nits, though it may persist long enough to kill the young louse on hatching. (3) In other parts of the world, strains of lice immune to D.D.T. have been reported, and it is important to look out for this phenomenon here. These resistant lice may survive an exposure of 24 hours to 10% D.D.T. powder.

Anaesthesia in E.C.T.

Q.—Is an anaesthetic really necessary for electro-convulsion therapy?

A.—In electro-convulsion therapy some retrograde amnesia is the rule and patients rarely have any unpleasant memory of the previous treatment. There is therefore little need for an anaesthetic in these circumstances. However, it is now common practice to "soften" the convulsion by the previous administration of a relaxant. In the case of curare and gallamine triethiodide ("flaxedil"), if these drugs are given in a dose just sufficient, say, to make snapping of the finger a little difficult, no anaesthetic is really necessary. When, however, succinylcholine chloride ("scoline") or "brevidil" is used, the fibrillary twitchings which precede the muscular paralysis may be quite unpleasant, and the previous injection of a little thiopentone becomes necessary. An average dose of thiopentone for a healthy male would be 0.2–0.25 g., followed immediately by the succinylcholine, after which the convulsion is induced.

Sweating in Shock

Q.—Why do shocked patients sweat?

A.—Sweat glands are innervated, anatomically, by the sympathetic nervous system, although there is doubt as to whether the physiological transmitter at the post-ganglionic nerve ending is acetylcholine or noradrenaline.¹ Shock is associated with a reduced circulating blood volume, and, as a compensatory measure, vasoconstriction of the cutaneous blood vessels is induced by intense sympathetic overactivity. Although teleologically unfortunate, this efferent sympathetic discharge also involves the fibres supplying the sweat glands and results in the characteristic pale, moist skin of the shocked patient.

REFERENCE

¹ Barnet, A. J. (1951). *Nature, Lond.*, 167, 482.

NOTES AND COMMENTS

Beeswax.—Mr. C. C. TONSLEY (Editor, *British Bee Journal*) writes: My attention has been drawn to the item "Beeswax" ("Any Questions?" August 1, p. 296). While I do not disagree with the answer generally which is supplied to the question, I would like to remedy one error which has been stated. In modern beekeeping paraffin wax combs are not given to the bees. If anything but beeswax were offered to bees they would immediately tear it down and build natural comb in its place. Experiments with which I have been associated, where both plastic and metal combs were given to the bees in an effort to get them to use them, resulted in the bees first coating either the plastic or the metal with a thin layer of beeswax before using them, and unless crowded for space they ignored them. In America there is what is called a three-ply foundation made which is given to the bees to draw out into combs. This, however, consists of two outer sheets of pure beeswax with a thin sheet of carnauba wax sandwiched between. The bees draw this outer beeswax into their comb but they do not reach the midrib of vegetable wax.

Vaccination in Pregnancy.—Dr. NORMAN TAYLOR (Geneva) writes: The question recently asked on vaccination in pregnancy (July 25, p. 235) did not include reference to the dangers of yellow fever inoculation during pregnancy, as these two operations are nowadays so often required together and urgently. I presume, on theoretical grounds, since they are both live vaccines, both are equally capable of producing undesirable consequences.

OUR EXPERT writes: Although yellow fever vaccine consists of living virus, there is no evidence of its producing any toxic effects in a pregnant woman, and therefore there is no contraindication to its administration during pregnancy.

Isopropyl Alcohol.—The Isopropyl Alcohol Regulations, 1927 ("Any Questions?" July 11, p. 108), which govern the use of the substance, were suspended in August, 1950. They have not been annulled and therefore, if necessary, could be reimposed.

Corrections.—In the review of *Operative Thorakoskopie* (*Journal*, August 1, p. 265) it was stated that Jacobaeus was a Croatian surgeon. He was, in fact, Swedish.

The reference to Dr. E. Parry Jones in Mr. H. Vincent Corbett's letter in the *Journal* of August 8 (p. 340) was to his book, *Kielland's Forceps* (1952, Butterworth, London), and not to his letter which appeared in the *Journal* of June 6 (p. 1278).

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BRONCHIAL CARCINOMA: INCIDENCE AND AETIOLOGY*

BY

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

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A little over a hundred years ago Dr. Gavin Milroy took an active part in the establishment of the Epidemiological Society. The object of the Society was to study "epidemic and endemic diseases, with special reference to the investigation of (a) the various external or physical agencies, and the different conditions of life, which favour their development or influence their character, and (b) the sanitary and hygienic measures best fitted to check, mitigate, or prevent them." In 1850, interest was focused on the great epidemic diseases, but the methods Milroy urged—the collection of statistical data on the natural history of disease over large areas and over periods of years followed by inductive reasoning from the observed facts—are as applicable to-day to the study of lung cancer as they were then to the study of plague, typhus, and cholera. And the rapid increase which has been recorded in the mortality from lung cancer suggests that it is urgent to determine the measures "best fitted to check, mitigate, or prevent" it.

Incidence

No figures are available for assessing the incidence of lung cancer in Britain, other than the mortality statistics of the Registrars-General. Because of its great fatality, the number of persons dying from it is nearly equal to the number affected, and, from this point of view, mortality statistics provide a reasonable estimate of the incidence. They are, however, subject to the inaccuracy inherent in the certification of causes of death.

The salient feature of the reported mortality is the extent to which it has increased in the last 50 years—and particularly in the last 25 years. In 1900 the crude annual death rate attributed to lung cancer in England and Wales was 8 per million persons; by 1925 it had risen to 20 and by 1950 to 278 per million.† In other words, the recorded rate increased two and a half times in the first 25 years, and 14 times in the next 25 years.

By 1950, 12,241 deaths were attributed to lung cancer in one year—10,254 in men and 1,987 in women. As a site of cancer, in both sexes taken together, the lung was second in importance to the stomach, but it was easily the most important site in men—giving rise to 28% more deaths than were attributed to cancer of the stomach and to more than double the number attributed to cancer of the colon. Of all cancers in men, 24% were classified as having arisen in the lung, but at ages 45–54, when lung cancer was relatively most

frequent in proportion to other cancers, the proportion was 40%.

Compared with non-malignant diseases, lung cancer was recorded as a more common cause of death in men than hypertension or respiratory tubercle; but only a third as many deaths were attributed to it as were attributed to coronary artery disease. Of all male deaths in 1950, 4% were attributed to lung cancer; at ages 45–54 the proportion was 10%.

There is no reason to suppose that these figures have yet reached their maxima. On the contrary, the trend in mortality rates suggests that lung cancer will reach an even more prominent position. It is difficult to estimate the actual number of deaths which will occur. Trends do not always continue smoothly. For example, the trend in male mortality at ages 35–44 showed an almost steady increase from 1920 to 1946, when the rate reached the level of 166 deaths per million men. In 1950 the rate might have been expected to be about 190 per million, whereas in fact it remained the same as four years earlier. If future experience proves that the mortality in men aged 35–44 has, in fact, become stable, it is to be expected that the increase will also cease in the older age groups, but only after progressively longer periods of time have elapsed.

The maximum mortality from lung cancer, unlike that from every other major form of cancer in men, is not in the oldest age group. At present it lies in the age group 65–74, and in 1931–47 was a decade earlier (Fig. 1). Over the last 20 years the age distribution has become somewhat closer to that of the other major forms of cancer. If it can be assumed that the death rates under the age of 45 have now become stable, and that the trend in the age distribution continues until the distribution is similar to that of, say, cancer of the stomach, a rough estimate can be made of the number of deaths which will eventually be attributed to lung cancer. On such assumptions—admittedly highly speculative but, I think, not wholly unreasonable—the number of deaths, for a population of the same age and sex composition as at present, will eventually reach 20,000. In fact, the future population will almost certainly contain a higher proportion of old persons, so that the number recorded in 20 years' time may be as great as 25,000.

Increase in Incidence

The evidence that lung cancer has become more frequent derives from necropsy studies as well as from vital statistics and clinical series. Figures from Leeds General Infirmary

*The Milroy Lectures delivered at the Royal College of Physicians of London on February 10 and 12, 1953. (Abridged.)
†By 1952, the rate had reached the level of 321 per million.

published by Bonser (1934) and brought up to date by Watkinson (personal communication) show a rise in the proportion of necropsies at which a bronchial carcinoma was found from 1.4% in 1928-32 to 4.0% in 1949, and from 7.5% of all cancers found at necropsy to 16.9%. Figures from St. Mary's, St. Bartholomew's, and the Glasgow Western Infirmary also show increases over the last 15 years (Daff, Doll, and Kennaway, 1951). The only contrary experience recently recorded is that of Bryson and Spencer (1951); earlier reports are purposely not considered, as they would not seem to be relevant to a problem which has presented itself in an acute form only since they were written.

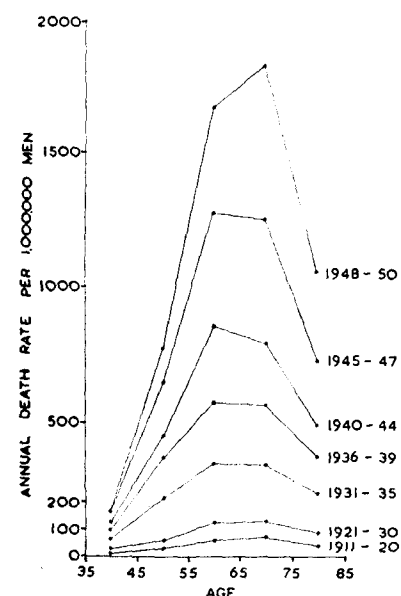


Fig. 1.—Mortality from lung cancer among men at different ages, 1911-50.

Bryson and Spencer's material was collected from the necropsy records of the Central Histological Laboratory of the London County Council over a period when the number of necropsies performed increased rapidly (from 684 to 1,723 a year), although the number of patients admitted to the 26 hospitals concerned fell by a quarter. It seems likely that, in fact, the type of subject coming to necropsy changed considerably, and this is borne out by finding that the proportion of cancers which arose in the large intestine increased from 5% to 13%. If, therefore, Bryson and Spencer's material suggests that bronchial carcinoma did not increase between 1936 and 1947, it also suggests that cancer of the large intestine did—which is contrary to the evidence of mortality statistics and to all clinical impression.

The increase recorded by vital statistics is partly due to the increasing proportion of the population who live to the cancer age. This, however, accounts for only a small part of the increase. If the sex and age distribution of the population in 1950 had been the same as it was in 1931, the general rate for the population would have been 236 per million instead of 278 per million; that is, there would still have been a five-fold increase in 19 years (Fig. 2).

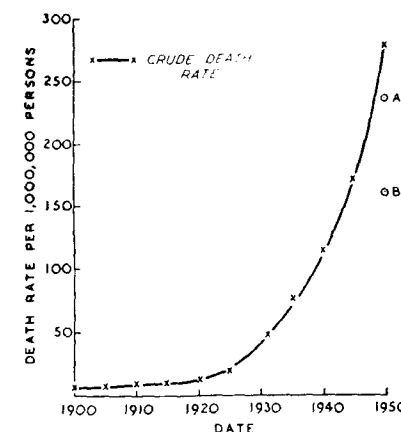


Fig. 2.—Death rate from lung cancer in England and Wales, 1900-50. A=Estimated death rate in 1950 with population of age and sex distribution as in 1931. B=Estimated death rate in 1950 with population of age and sex distribution as in 1901.

It has been held that the great increase in the recorded mortality in Britain may be due to the successive introduction of radiography, bronchoscopy, pneumonectomy, cytological examination of the

sputum, and diagnostic thoracotomy. It would indeed be strange if the consequent increased facility in diagnosis had not been reflected in a more general recognition of a clinically obscure disease. It must also be recognized that improvements in therapy of the infectious diseases—particularly of pneumonia—must have reduced the number of deaths occurring from the early complications of lung cancer and so allowed a greater proportion of the cases to proceed to a readily diagnosable stage. In illustration of the close relationship presumed to hold between the lung cancer death rate and the standard of medical diagnosis and certification, Rigdon and Kirchoff (1952) have shown that the correlation coefficient between the death rate and the number of patients per physician in the 48 States of the U.S.A. is -0.66 : that is, the fewer the patients per physician the higher the lung cancer death rate.

In recent years Willis (1948) in Britain and Clemmesen and Busk (1947) in Denmark have, like Steiner (1944) in the U.S.A., expressed the view that the increase is spurious. It seems, however, as pointed out by Heady and Kennaway (1949), that Willis based his opinion on evidence collected before 1933—that is, before the greater part of the increase was recorded, while Clemmesen has revised his opinion (Clemmesen, Nielsen, and Jensen, 1953) and Steiner has been convinced that a real increase has taken place locally—for example, in Los Angeles (Steiner, Butt, and Edmondson, 1950).

Reasons for believing that there has been a real increase are:

(1) The increase in the recorded death rate still continues, despite the long period which has elapsed since attention was drawn to the importance of the disease.

(2) The disease is now so common that had the increase been entirely spurious it would be necessary to postulate that 50 years ago 95% of the fatal cases were wrongly certified.

(3) Necropsy examinations conducted under the supervision of single eminent pathologists, at teaching hospitals where over 90% of the subjects who died came to necropsy—for example, St. Mary's, London, and Leeds General Infirmary—have also shown considerable increases in the proportions of bronchial carcinomas to all cancers and to all necropsies.

(4) The increase has been persistently greater in men. Passey and Holmes (1935) suggested that this might be due to the greater facilities for medical attention available to men under the National Health Insurance Act, but in the few years that have elapsed since the introduction of the National Health Service Act, in July, 1948, the disparity has become even greater (Fig. 3).

(5) The age distribution of lung cancer in men is different from that of all other major types of male cancer, and has been changing in form while its incidence has been increasing. Korteweg (1951) notes that the trends in England and Wales are in conformity with the hypothesis that a real increase has occurred and that successive generations have been exposed to extraneous carcinogens to different extents. The same phenomenon has been observed in Denmark (Clemmesen, Nielsen, and Jensen, 1953).

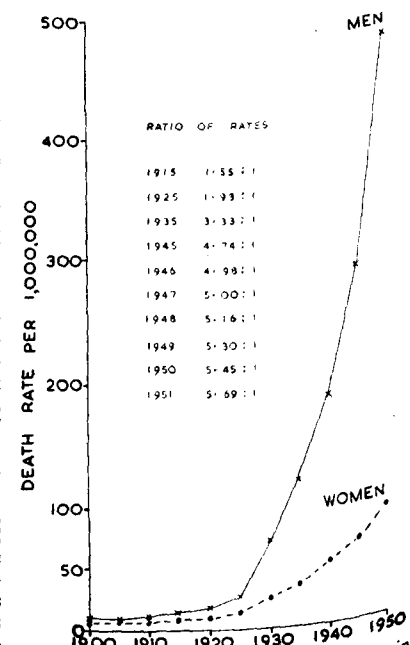


Fig. 3.—Death rates from lung cancer in England and Wales, 1900-50.

(6) The death rates in town and country have, in England and Wales, retained the same relation to one another.

(7) The mortality among doctors, who may be presumed to be as carefully investigated as any section of the community, has been practically the same as that for the whole population (Kennaway and Kennaway, 1947; Dublin, Spiegelman, and Leland, 1947).

It cannot be said that all workers are agreed on the conclusions to be drawn; Rigdon and Kirchoff (1952), for example, continue to believe that the increase is wholly spurious. At the International Symposium on the Endemology of Lung Cancer held last year at Louvain, however, it was agreed that "a significant part of this increase is absolute and represents a real increase in the number of people suffering from cancer of the lung" (Council for International Organizations of Medical Sciences, 1953), and the conclusion of the Symposium seems to me to be reasonable.

How much of the increase is real after standardizing for age and sex remains uncertain. The extent of the change in the last five years, when the importance of the disease has been recognized and facilities for diagnosis have been readily available, suggests that the real increase is likely to be large. I believe it may well be more than half. On the other hand, I would think it certain that some of the increase is nosological and some is due to the therapeutic advance which prevents death from pneumonia before the presence of the underlying growth is evident.

Possible Explanations of the Increase

The importance of the conclusion reached is that it holds out hope for prevention. An increase of the rapidity and extent of that presumed to have occurred cannot be accounted for on the basis of a changing inherent constitution. Some potent environmental factor must have become prevalent, and therefore, when the factor is identified, it may prove possible to reduce its influence.

Factors which have been considered are (1) atmospheric pollution with (a) the waste products of domestic chimney and factory smoke, (b) the exhaust fumes of vehicles, and (c) the dust from tarred roads; (2) the smoking of tobacco; and (3) the after-effects of certain respiratory infections—for example, influenza of the type associated with the 1918-19 pandemic and tuberculosis.

Animal Experiments

The effect of these and other factors has been studied extensively in animals. Unfortunately, although lung tumours have been described in many species, there is no laboratory animal which spontaneously develops tumours comparable to the ordinary squamous or anaplastic carcinoma of the bronchus of man. For example, the common pulmonary tumour of mice, which has been the subject of most experiments, is a papillary adenocarcinoma and, according to Grady and Stewart (1940), is of alveolar rather than of bronchial origin.

Many substances, when fed to mice, painted on the skin, or injected parenterally, increase the incidence of this tumour—the most effective method generally being intravenous injection. Not all strains of mice respond in the same way; strains with high and low incidences of spontaneously occurring pulmonary tumours have been separated and different strains react in different ways to the application of the same substance. Many—though not all—of the hydrocarbons known to be carcinogenic under other conditions have been shown, on testing by these methods, to produce pulmonary tumours. The most potent is urethane.

Tumours more like the human type have been produced in mice by Andervont (1937), by the insertion of a piece of cotton thread impregnated with 1,2,5,6-dibenzanthracene directly into the lungs; by Smith (1950), by the implantation of lung tissue from embryo mice along with

solutions containing methylcholanthrene or dibenzanthracene into the thigh muscles of adult animals; and by Lisco and Finkel (1949), by the administration of radioactive cerium (Ce^{144}) in the form of an aerosol.

Substances derived from sources suspected of being implicated in causing human lung cancer have been tested by exposing mice to atmospheres containing the test substance in the form of dust or smoke, or by skin-painting. McDonald and Woodhouse (1942) found an increased incidence of pulmonary tumours in mice exposed to inhalation of soot collected from the air of an English city, and Leiter, Shimkin, and Shear (1942) produced sarcomas in mice at the site of inoculation with extracts of soot collected from the air of several American towns. Campbell (1934) found a greatly increased incidence of pulmonary tumours in mice exposed to an atmosphere heavily laden with the dust from tarred roads, and many animals also developed carcinoma of the skin, presumably from contact with the dust externally; road dust from which the tar had been extracted also increased the incidence of the tumours, but to a less marked extent (Campbell, 1937). Mice kept in an atmosphere of tobacco smoke by Campbell (1936) in Britain and by Lorenz, Stewart, Daniel, and Nelson (1943) in America showed no significant increase in the number of tumours.

In contrast, Essenberg (1952) has recorded an increased incidence in mice exposed to high concentrations of cigarette smoke. The mice came from a strain with a high spontaneous incidence, and tumours were obtained in 21 out of 23 (91%) in the experimental group against 19 out of 32 (60%) in the control group. It may be significant that the cigarette smoke was drawn directly into the animal box in Essenberg's experiment, whereas in the other experiments it was introduced through tubing. In no case have the conditions reproduced those to which men are exposed in smoking, nor can they do so unless animals are trained to smoke. Tar obtained from tobacco burnt at temperatures normally reached in pipe-smoking has resulted in the production of carcinomas when applied to the skin, both in mice (Flory, 1941; Graham, Wynder, and Croninger, 1952) and in rabbits (Sanders, Thomson, Cooper, and Lamb, 1932). The tumours have not been produced easily, but there is no doubt that tobacco tar can contain a carcinogenic agent. Experiments in which animals have been exposed to the exhaust fumes of cars have proved negative (Campbell, 1936; Twort, 1939).

The application of these results to the study of human lung cancer is problematical. In the first place, the pulmonary tumour of mice is histogenetically different from bronchial carcinoma, and tumours which more closely resemble the human type have been produced only by methods which do not appear likely to have any direct counterpart in naturally occurring carcinogenesis. The rarity of bronchial carcinoma in animals accords with the theory that the tumour in man commonly arises from some specifically human activity. In the second place, it is clear that most of the sources suggested as responsible for the production of bronchial carcinoma—atmospheric soot, dust from tarred roads, and tobacco tar—can be shown, by selected methods of application, to contain substances which are carcinogenic for some animals. Whether they are of importance in the production of the human disease can be determined only by observations on man.

Incidence in Different Parts of the World

It is always difficult to compare vital statistics from different countries, and particularly so when they relate to a disease like lung cancer, which is not easy to diagnose with certainty by clinical methods. Necropsy statistics have the advantage that the diagnoses can be relied on, but the populations from which the subjects are drawn are seldom known with accuracy, and much bias may be introduced into the figures, for this reason, without there being any evidence of its nature.

TABLE 1.—Death Rates from Lung, Respiratory, and Non-respiratory Cancers in Various Countries, 1949

Death Rate per 1,000,000	Country	Death Rate per 1,000,000		Lung Cancer as % of all Cancers Found at Necropsy
		Respiratory Cancer	Lung Cancer	
1,584	England and Wales	288	251	31.0, 21.4, 16.1
1,597	Scotland	256	228	20.4
1,086	Finland	171	—	—
1,123	Uruguay	171*	—	—
1,652	Switzerland	151	122	—
1,262	Holland	144	133	16.0
1,545	France	135	—	—
1,256	U.S.A.	131	112	11.3, 10.4
1,474	W. Germany	131	—	—
1,271	New Zealand	127	—	—
1,041	S. Africa	110	—	—
1,131	Canada	106	—	—
1,462	Denmark	106	97	—
1,152	Australia	103	—	—
1,292	Ireland	99	—	—
988	Italy	84	—	—
1,407	Iceland	80†	58	3.1
666	Spain	67	—	—
1,411	Norway	63	54	—
809	Chile	47†	—	—

* 1947. † 1948.

Necropsy series.—England and Wales: St. Bartholomew's, 1945-8, St. Mary's, 1945-8, Leeds General Infirmary, 1945-9. Scotland: Western Infirmary, Glasgow, 1945-8. Holland: Amsterdam and Rotterdam, 1951 (Korteweg, personal communication). U.S.A.: Los Angeles, 1943-6 (Steiner, Butt, and Edmondson, 1950); Texas, 1945-9 (Rigdon and Kirchoff, 1951). Iceland: Reykjavik, 1940-50 (Dungal, 1950, and personal communication).

Not all countries which publish vital statistics separate lung cancer from other cancers of the respiratory system. Of those that do, the highest rates recorded in 1949 were in England and Wales (251 per million) and in Scotland (228 per million), the next highest in Holland, Switzerland, and the U.S.A. (all around 110-120), and the lowest in Iceland (58†) and in Norway (54). Differences of this size (4½ to 1) cannot be accounted for by demographic differences. If, for example, the English rates had held for populations of the sex and age distributions of the U.S.A. and Norway, the death rates would have been 223 and 239 per million and still much higher than the rates actually recorded in those countries.

The forms of respiratory cancer other than cancer of the lung have, in all probability, different aetiologies; lung cancer, however, accounts for such a high proportion of all respiratory cancer that important differences in the mor-

The rates for all forms of cancer other than respiratory give an indication of the reliability of the national statistics. All forms of cancer may be relatively infrequent in some countries, but, in view of the great variety of factors responsible for the production of cancer in different sites, conditions favouring a generally low rate are unlikely to be common. A low rate for all non-respiratory cancers in conjunction with the low rate for respiratory cancer must arouse the suspicion that many cases are not diagnosed; a high rate for all non-respiratory cancers with a low respiratory cancer rate will, on the other hand, suggest (though it does not prove) that the respiratory rate is reasonably reliable. If necropsy studies in the same country also indicate a low proportion of lung carcinoma the impression will be strengthened.

With these considerations in mind, it would be unwise to attach importance to the low respiratory cancer rates reported from Italy, Spain, and Chile. On the other hand, in both Norway and Iceland there is no deficiency of diagnosis of cancer generally, and it seems reasonable to believe that the extremely low rates reported for lung cancer are real. In Iceland, moreover, Dungal (1950) found a very low proportion of lung cancers at necropsy at the University Clinic (where necropsy is routinely performed on all patients who die).

Very low incidences at necropsy have been reported from many parts of the world for which vital statistics are lacking (Table II). Gharpure (1948) found no case of lung cancer among 4,321 necropsies performed in Bombay during 1926-46, and Strachan (1934) found none among 1,901 necropsies on native South Africans. In this context, it is of interest that the death rate from lung cancer among the non-white population of the U.S.A. is of the same order as that among the white population, so that the apparent difference found between Europeans and native Africans is unlikely to be due to heredity. The average age at death in the Indian and South African native cases must have been much less than that in recent European series, and this, alone, will have considerably reduced the proportion found to be cancer of the lung. Nevertheless, an appreciable number of cancers were found in the sites which commonly give rise to cancer among Europeans, and it is unlikely that no case of bronchial carcinoma should have occurred in such large series if the condition was as common in India and South Africa as it is in Britain.

TABLE II.—Incidence of Lung Cancer at Necropsy in Different Countries

Author	Place	Period	Lung Cancer as % of All Necropsies			Lung Cancer as % of All Cancer Necropsies		
			M	F	M+F	M	F	M+F
—	England (average for St. Mary's, St. Bartholomew's, and Leeds G.I.)	1945-8	6.2	2.6	5.0	29.6	11.0	22.8
See Daff, Doll, and Kennaway (1951)	Turkey (Istanbul)	1945-9	2.8	0.8	2.1	20.3	7.8	17.0
Shik (1946)	Yugoslavia (Ljubljana)	1945-9	1.5	0.6	1.1	11.8	3.1	7.1
Gharpure (1948)	U.S.S.R. (Moscow)	1936-43	—	—	1.8	—	—	15.6
Nath and Grewal (1935)	India (Bombay)	1926-46	0.0	0.0	0.0	—	—	0.0
Kouwenaar (1950)	India (Lahore, Lucknow, and Patna)	1914-34	—	—	0.1	—	—	1.5
Davies (1948)	Indonesia (Chinese)	—	—	—	0.9	—	—	9.2
Strachan (1934)	Indonesia (Javanese)	—	—	—	0.1	—	—	2.3
—	E. Africa	1931-47	—	—	—	—	—	1.4
—	S. Africa (Bantus only)	1924-33	0.0	0.0	0.0	0.0	0.0	0.0

tality from respiratory cancer are likely to simulate underlying differences in the mortality from lung cancer. Figures for the death rate from respiratory cancer are shown in Table I for all those countries for which the statistics are published.

Table I also shows the death rates from all forms of cancer other than respiratory and, for some countries, the death rates from lung cancer alone and the proportion of bronchial carcinomas among all cancers found at necropsy in recent series—that is, in necropsies performed since 1940.

†The rate for Iceland is for 1948.

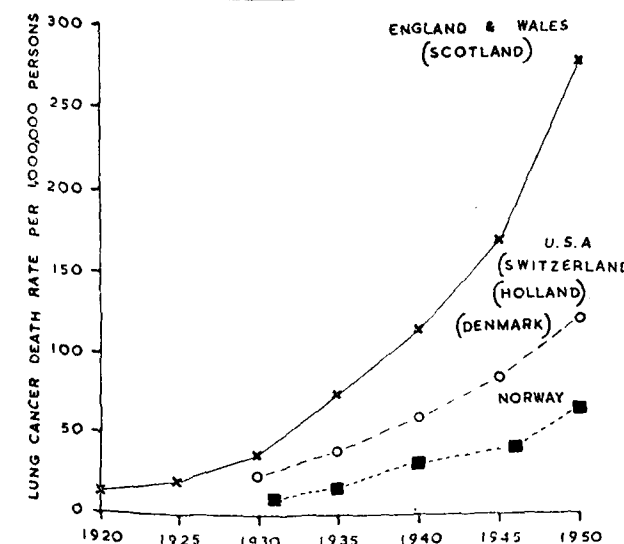


Fig. 4.—Lung cancer. Death rate in different countries, 1920-50. Rates for the countries shown in parentheses were close to the rates for the countries with which they are grouped.

Differences Between Town and Country

Important differences in incidence have also been noted between sections of the population within individual countries. Though mostly less dramatic than the differences between countries, they have hitherto been of greater value in elucidating the aetiology of the disease, since it has been possible to define more precisely the differences in environment to which the separate groups have been exposed. For example, differences in mortality have been noted between countrymen and townsmen and between the inhabitants of towns of different sizes. According to the Registrar-General, the death rate from lung cancer in 1950 was twice as high among the male inhabitants of Greater London as among men living in rural districts, and the difference was more pronounced in the older age group. The rates for other parts of the country fell between the Greater London and rural rates, in exact order of town size (Fig. 5). Female rates show the same trends, though the differences are less marked and the trends somewhat blurred, possibly owing to smaller numbers. Comparison of the relative differences at different periods shows that these differences have remained remarkably stable despite the great increase in the recorded mortalities.

Stocks (1952) has analysed the urban death rates for the period 1946-9 and has demonstrated a progressive increase with the increase in the number of inhabited houses. Within Greater London, he found that the boroughs with the highest mortalities were situated to the north and east of the town's centre. This, he suggests, may be related to the direction of the prevailing wind, which is from the south-west—and might therefore be expected to shift the area of maximum smoke density to just that part of the town in which the highest mortalities occur.

As always, when drawing conclusions from vital statistics, it must be asked whether the differences can be purely nosological; whether the "factor" is nothing more than a greater facility for diagnosis in the larger towns. This seems unlikely. In the first place, it would hardly be expected that diagnostic acumen should be so closely dependent upon the exact size of town; secondly, there is the stability of the urban:rural ratio; and, thirdly, there is direct evidence obtained by Doll and Hill (1952). They found, among 1,465 patients

with carcinoma of the lung and the same number of matched control patients with other diseases, that the proportion who had ever lived for any long period in the country was lower among the carcinoma patients, irrespective of their present place of residence. That is to say, among patients residing in Greater London at the time of interview a lower proportion of those with lung carcinoma than of those with other diseases had ever lived for 10 or more years in a rural district—and similarly for each other place of present residence. The differences were small and not statistically significant, but they were all in the same direction, and provide some support for the belief that the risk of developing lung cancer is, in fact, lower in the countryside.

The observation of a town and country difference is not confined to Britain. Clemmesen, Nielsen, and Jensen (1953) have reported an even more pronounced difference between the capital and rural areas of Denmark. In their opinion, however, the difference is not constant, but may be explained by the spread of a new carcinogenic factor to the countryside, 10 years after it had begun spreading in the capital.

In Norway, the difference between urban and rural areas—as definite as in Britain, despite the low total incidence—is also increasing. Mortality statistics, for which I am grateful to Professor Kreyberg, provide the following comparisons:

Ratio of Death Rate in Town and in Country

		1931-5		1946-50	
Men	..	1.8:1	..	2.5:1	
Women	..	1.1:1	..	1.5:1	

It seems, therefore, as if differences are constantly in the same direction, but that there may also be local differences which modify the trends in different countries.

Three substances known to be carcinogenic under suitable conditions have been identified in town air. According to Dawson (1952) radioactive material is present to the extent of $30-100 \times 10^{-12}$ curie per m.³. Activity in the open air of towns is not much greater than in rural areas, but within closed rooms the activity may be doubled, and in extreme cases, as in an underground shelter, it was found to be 100 times greater. Even this value is, however, only one-tenth of the tolerance concentration—unless it proves (as it may do) that the limit at present accepted is set too high.

The amount of arsenic varies, according to Goulden, Kennaway, and Urquhart (1952), from 0.04 µg. of As₂O₃ per m.³ in Bristol to 0.16 µg. per m.³ at Beckton, in London.

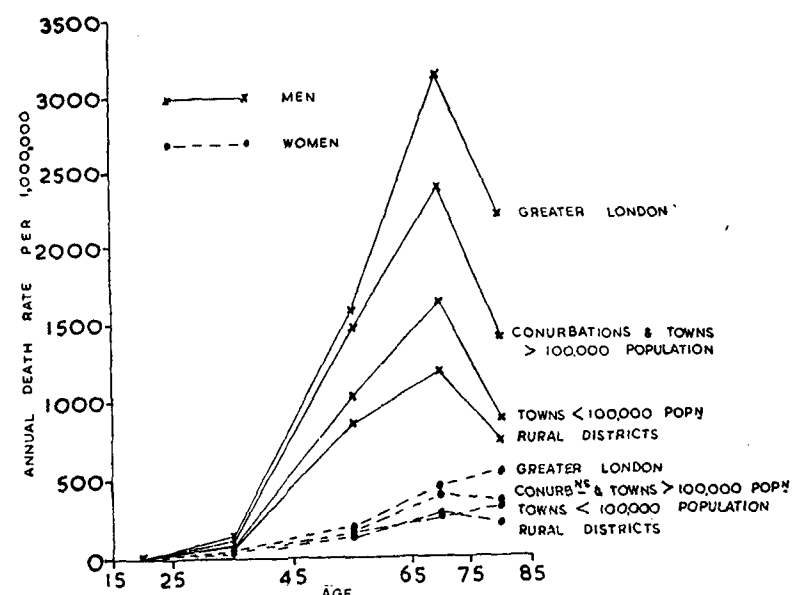


Fig. 5.—Death rate from lung cancer in different areas of England and Wales, 1950.

It is, however, difficult to ascribe any one value to a town, as there are considerable variations between stations within towns—for example, the concentration in the air at County Hall, London, was only a third of that found at Beckton and only slightly greater than that recorded in Bristol. The total amount inspired by a town dweller per year is estimated by Kennaway to be 0.5 mg., which is only one-tenth of the amount in the maximum official dose of Fowler's solution (0.5 ml.).

According to Waller (1952), benzpyrene is present in town air, in amounts varying from 0.013 $\mu\text{g. per m.}^3$ in Bristol to 0.046 $\mu\text{g. per m.}^3$ of air in the centre of London. Again, however, variations in the concentration make it necessary for many readings to be obtained before a fair estimate can be made of the content of the air of a town as a whole. Winter concentrations are three to four times greater than summer concentrations, and great increases are obtained during fogs. In Waller's opinion the variations in benzpyrene content suggest that most of it is derived from the smoke of domestic fires. Some has, however, been detected in motor exhausts, and, since the sizes of the particles in exhaust smoke are concentrated over a limited range of small sizes, this source could be of greater biological significance than appears from the proportion which it contributes to the total air pollution.

Occupational Risks

The classical method leading to the isolation of chemically pure carcinogens is the observation of specially high cancer risks in specific occupations. With lung cancer, exceptional risks have been recognized in several unrelated industries. These are: mining of various ores in Schneeberg (Germany) and in Jachymov (Czechoslovakia); chromate production; nickel-refining (in Clydach, S. Wales); asbestos manufacture; and the production of gas. To these should probably be added the handling of inorganic arsenic and, possibly, occupations providing excessive exposure to iron dust, with or without added exposure to silica.

The risks involved have been estimated only for chromate workers and gas-workers. Brinton, Frasier, and Koven (1952), extending the initial observations of Machle and Gregorius (1948), have compared the sickness and mortality experience of insured workers in the seven chromate-producing plants in the U.S.A. with the whole sickness data obtained by the U.S. Public Health Service and the death rates for the U.S. population. They found that the mortality from lung cancer among white males employed in the plants was 14 times the expected, and among coloured males it was 80 times the expected. According to Bidstrup (1951) the risk is unlikely to be as great in the British chromate industry.

Doll (1952) studied the causes of death among 2,071 male pensioners of a London gas company and found that the number of deaths from lung cancer was approximately double that expected by comparison with male inhabitants of London of the same age distribution—that is, 25 deaths against 13.8. Confidence that this small excess is real derives from the observation that for all other causes of death studied the numbers observed were not significantly different from those expected; it is also of the same order as that determined by Kennaway and Kennaway (1947), when they drew attention to the possibility of there being a risk in the gas industry.

Of the other occupational risks, that incurred in the Schneeberg and Jachymov mines is likely to have been the highest; as much as 50 to 75% of all deaths among the miners may have been due to lung cancer (Haerting and Hesse, 1879; Lange, 1935; Peller, 1939). The risk in the Clydach nickel refinery—at least till the reorganization of the plant in 1924—must also have been considerable (Chief Inspector of Factories, 1949). In the manufacture of asbestos and arsenical sheep dip the risk is more likely to have been of the same order as that involved in the pro-

duction of gas. For example, Gloyne (1951) found that of 52 men dying with asbestosis, about 20% gave evidence of the presence of a primary lung cancer, whereas among men with other forms of pneumoconiosis the proportion was 7%. As is shown later, there are reasons for believing that the incidence among men with pneumoconiosis is generally close to the average.

The evidence of the existence of a risk of lung cancer in the handling of inorganic arsenic derives from an investigation by Hill and Fanning (1948) into the causes of death among men employed in a factory making sheep-dip. They traced five deaths due to lung cancer among these men, whereas they estimated, by comparison with the causes of death in other workers in the area, that there should have been only one.

The existence of special cancer risks in most of these industries is not surprising, since the workers in them have been exposed in the past (and in some cases still are exposed) to unusual concentrations of known carcinogens. According to Evans (1950) the mean concentration of radon in the air of the Jachymov mines is about 3×10^{-6} curie per m.^3 , while the tolerance concentration is at the most 10^{-7} curie per m.^3 —that is, one-thirtieth of that found in the mines. Hueper (1952) has produced sarcomas in mice at the site of injection with suspensions of finely dispersed nickel powder, and nickel must be presumed to be deposited in the respiratory passages on the decomposition of nickel carbonyl, a gas produced in the refining process at Clydach. Gas-workers are exposed to coal tar—one of the most prolific sources of carcinogenic hydrocarbons and including benzpyrene. Finally, arsenic is known to produce cancer of the skin in man when ingested over long periods, and large quantities (up to 1,000 $\mu\text{g. per m.}^3$) were found in the atmosphere of the sheep-dip factory (Perry, Bowler, Buckell, Druett, and Schilling, 1948).

No direct evidence is available on the nature of the carcinogenic factor in the chromate and asbestos industries.

The position with regard to iron-workers is obscure. Turner and Grace (1938) found that foundry-workers, smiths, and metal-grinders had a mortality from lung cancer higher than that of any other occupational group in Sheffield; and Turner and Martin (1949) found that out of 32 cancer deaths among grinders with silicosis the lung was the primary site in 19. Metal-grinders also suffered a high mortality from lung cancer in Kennaway and Kennaway's (1947) material. These observations might be thought to imply that silicosis predisposed to lung cancer, but this has been convincingly shown not to be true (Miners' Phthisis Medical Bureau, 1936; Kennaway and Kennaway, 1947). If there is any excess among special groups of metal workers it must be presumed to be due to some other, and more specific, industrial hazard.

An attempt has been made to discover whether any other common occupation carries a special risk by interrogating patients with and without bronchial carcinoma about their past occupations. The questions were asked as part of a general investigation into the aetiology of bronchial carcinoma which has been described previously (Doll and Hill, 1950, 1952). Altogether 1,357 men with bronchial carcinoma and 1,357 men with other diseases were interviewed. Occupations in which the men had been employed for three or more years were recorded; no account was taken of time spent in the Services unless the patient had served as a regular, and no analysis was made of employments under the age of 20, when changes of occupation were frequent. Many men had worked in two or more occupations for the minimum of three years, so that the number of occupations recorded was greater than the number of men interviewed—2,281 for the men with lung carcinoma and 2,415 for the same number of men with other diseases. Of all the 76 groups into which the occupations were classified, there were only two in which the differences between the numbers c-

bronchial carcinoma and of control patients who had been employed in them could be considered, by the usual statistical criteria, to be significant. The occupations recorded of the bronchial carcinoma patients included 80 in coal-mines and 16 in the police forces; of the control patients, there were 113 in coal-mines and 32 in the police forces. In view of its correspondence with the results of the analysis of the national mortality data made by Kennaway and Kennaway (1947), the deficiency of coal-miners among the bronchial carcinoma group may reasonably be taken to confirm that coal-miners are subject to a lower incidence of bronchial carcinoma than other industrial groups. The deficiency in the cancer group of men who had been employed as policemen may, in the absence of other evidence, be attributed to chance, since there is nothing surprising in finding one difference of this extent when so many groups have been studied.

The most important excess in the cancer group occurred in men who had been directly concerned with the production of gas; the cancer group contained 23 such men, the control group 14. Other evidence has shown that gas-workers are exposed to a special risk of lung cancer, and the present figures are corroborative—although, by themselves, not statistically significant.

The closeness of the numbers in the two disease groups who had been employed in many of the other occupations is striking. This is particularly so for occupations which might have been expected to be disproportionately represented in the lung-carcinoma group, if exposure to the dust of tarred roads or to motor exhaust fumes was responsible for many cases of the disease.

	Men with: Lung Carcinoma	Other Diseases
Motor mechanics, garage hands	19	25
Drivers of cars, lorries, or buses	105	101
Bus and tram conductors	10	21
Van drivers (horse)	33	25
Other road transport	17	25
Roadmen, council labourers, dustmen	39	39

The failure to find any difference in the relative proportions of men employed on the roads or in the service of cars is of interest. It accords with the conclusion of Kennaway and Kennaway (1947) that none of the open-air occupations, where there was special exposure to road dust, had a high incidence of cancer of the lung.

The results provide little or no support for the suggestion of Wynder and Graham (1951) that painters and what they describe as "hot" metal workers may suffer special risks.

	Men with: Lung Carcinoma	Other Diseases
Painters and decorators	70	59
Furnacemen, foundrymen, and smiths	26	23
Other metal workers	150	157

The evidence from a study of occupational factors is therefore that the development of bronchial carcinoma may result from prolonged exposure to a number of atmospheric carcinogens; some of these substances, like radon, benzpyrene, and arsenic, are present in town air—though in very much lower concentrations than occur in industry; others, like nickel, are peculiar to specialized industrial processes; others are as yet undetermined. So far as it goes, the evidence is against the hypothesis that motor fumes and road dust are responsible agents.

Although one occupation—the refining of nickel—is also responsible for a high incidence of cancer of the nasal sinuses, it is a remarkable fact that none of the occupations known to be associated with a high incidence of lung cancer appears to carry any increased risk of laryngeal cancer. It is probable, therefore, that the factors which are responsible for the production of carcinoma of the bronchus and for carcinoma of the larynx are independent.

Sex Ratio

According to all reports the incidence of lung cancer is much greater in men than in women. The extent of the

difference is, however, uncertain. In this country the mortality statistics of the Registrar-General gave, in 1950, a ratio of 5.2 male deaths to every female death, and the proportion has been increasing steadily, though slowly, from year to year. During the first half of 1949 Mackay's (1951) study of in-patients discharged from a number of selected hospitals (mainly teaching hospitals) gave a ratio of 5.1 to 1 and the national cancer registration scheme (which is believed to cover about half the cases in the country) gave, in 1946, a ratio of 6.9 to 1 (Stocks, 1950). Much higher ratios have been recorded in recent clinical series—varying from 7.3 to 1 to 12.6 to 1 (Fulton, 1949; Mason, 1949; Brooks, Davidson, Thomas, Robson, and Smithers, 1951; Doll and Hill, 1952).

The inconsistency may be partly due to the inclusion of a proportion of inaccurately diagnosed cases in the national

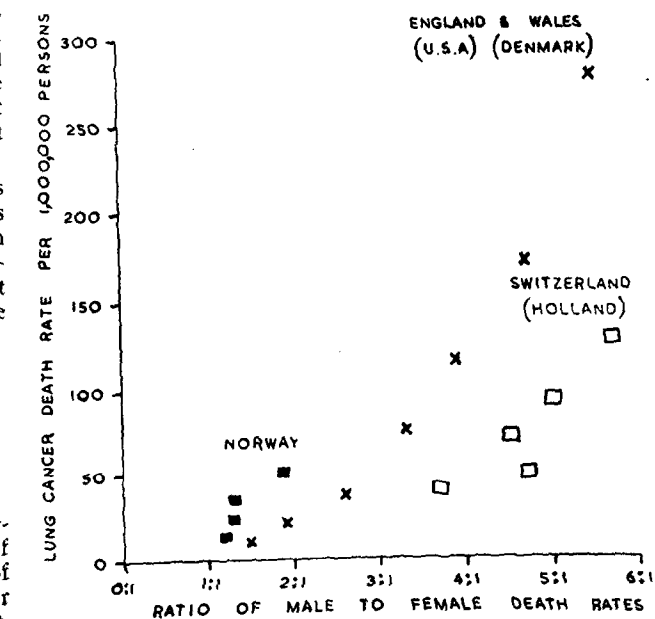


FIG. 6.—Lung cancer. Ratio of male : female death rates at different levels of incidence in different countries. Ratios for the countries shown in parentheses were at each level of incidence similar to the ratios for the countries with which they are grouped.

figures (though this should not apply to the cancer registration scheme), but it may also be due to the process of selection, which to some extent accompanies the collection of any clinical series—for example, through the exclusion of out-patients, the relative exclusion of the very old, or the availability of male and female beds.

Experience of the full and accurate registration scheme which is now operating in Denmark suggests that the true ratio is probably somewhat—though not much—higher than that indicated by death certificates, and it is reasonable to believe that the true ratio in the United Kingdom is, at the present time, of the order of 6 or 7 to 1.

At the beginning of the century the sex ratio, judged by mortality data, was as low as 1.3 to 1. In Norway the ratio is to this day not much greater. Generally it would appear that in all countries the higher the incidence of the disease the greater the male preponderance (see Fig. 6). It is notable that the relation between the sex ratio and the total incidence is not the same in all countries, but that in some a given degree of male preponderance is reached at a lower general level of incidence. It seems probable, therefore, that the factor mainly responsible for the increase is one to which men are particularly exposed and that the extent of the relative difference in exposure of men and women varies from country to country.

(Part II will appear next week with list of references).

SOME APPARENT ANOMALIES OF POTASSIUM METABOLISM

BY

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The importance of potassium in the body economy has for long been a matter of interest only to the physiologist. Within recent years, however, the recognition of serious potassium depletion in clinical conditions has aroused interest in potassium metabolism in health and disease. Our knowledge of this important cation has been derived from a wide variety of experimental and clinical observations, and the time seems ripe for a brief summary of the more important contributions.

Potassium Deficiency

In 1915 Benedict showed that potassium was lost along with nitrogen in fasting states, and, later, similar observations of potassium loss in diarrhoea (Butler *et al.*, 1933) and in diabetic coma (Atchley *et al.*, 1933) were made. The relationship of potassium to muscle contraction and muscle metabolism has always been of interest. In 1936 Brown and Feldberg showed that potassium liberated acetylcholine at ganglionic synapses. Fenn and Cobb (1936) found that, after indirect stimulation of the muscles of anaesthetized rats, potassium was lost from the muscle cell in exchange for sodium. These changes were reversed after rest, indicating that no irreversible damage had been done to the muscle. Cuthbertson *et al.* (1939) showed that, following operative fracture of the femur in rats, large amounts of potassium were lost in the urine, associated with an increased excretion of nitrogen and phosphorus. They observed that the potassium loss was relatively greater than the nitrogen loss, and seemed to be far greater than could be accounted for by the local changes at the site of injury.

The observations of Mullins *et al.* (1941) on the sodium permeability of the red cell indicated that the older concept of the impermeability of the cell to the cation sodium was not correct. Miller and Darrow (1941) showed that deoxycortone acetate reduced the muscle potassium content of rats and increased the muscle sodium content. This exchange of sodium for potassium in the cell was also demonstrated by Heppel (1939) and Miller and Darrow (1940a) in animals fed on a low-potassium/high-sodium diet. It was later observed in some clinical conditions such as alkalosis (Gamble *et al.*, 1945; Darrow, 1945), and in some types of infantile diarrhoea (Darrow, 1946).

By this time the loss of potassium in clinical conditions, often associated with signs of paralysis, had become recognized. Brown *et al.* (1944) observed a low serum potassium in chronic nephritis, associated with attacks of paralysis. Similar paralysis as a result of diminished extracellular potassium was described by Holler (1946) in treated diabetic coma. Govan and Darrow (1946) reported large losses of potassium in infantile diarrhoea, and observed that treatment with potassium improved the clinical state. In the development of hypokalaemia during the treatment of diabetic acidosis, Greenman *et al.* (1949) suggested that the dilution of extracellular potassium by intravenous infusions, the continued loss of potassium in the urine,

and the migration of potassium from the extracellular to the cellular phase might all contribute to the final clinical picture.

Potassium loss has also been observed after saline infusions (Stewart and Rourke, 1942; Gamble, 1942), after major surgical operations (Blixenkron-Møller, 1949; Wilkinson *et al.*, 1950), in *p*-aminosalicylic acid therapy, using the sodium salt (Cayley, 1950), in the use of ion-exchange resins (Dock and Frank, 1950), in idiopathic steatorrhoea (Lubran and McAllen, 1951), in pyloric stenosis (Hawkins *et al.*, 1951), and in chronic nephritis (Davidsen *et al.*, 1951). It seems probable that the potassium loss in such widely divergent conditions may be due to a few factors common to many clinical states. No matter the cause, the symptoms of hypokalaemia in all these conditions are similar, and are well summarized by Darrow and Pratt (1950): (1) weakness and hypotonia of skeletal muscle, leading finally to paralysis; (2) dyspnoea with gasping respirations; (3) cyanosis, chiefly respiratory in origin; (4) abdominal distension; (5) nausea and vomiting; (6) cardiac enlargement with systolic murmurs; (7) increased pulse pressure with Corrigan pulse; (8) elevated venous pressure with signs of cardiac failure; and (9) electrocardiographic changes.

Many of these signs of potassium deficiency are common to deficiencies of other electrolytes and of water, and are not, therefore, always convincing evidence of potassium lack. This matter is considered later, but it is important to appreciate that the electrocardiographic changes can be of considerable aid in diagnosis. These changes have been studied carefully by Frenkel *et al.* (1947), Nadler *et al.* (1948), and by Tarail (1948), and they have correlated the following changes with progressive deficiencies of potassium in the serum: (1) prolonged Q-T interval; (2) decreased height or inversion of the T wave; (3) rounded and prolonged T wave; (4) depression of the ST segment; and (5) inversion of the P wave, extrasystoles, and heart-block.

Hyperkalaemia

The toxic effects of increments in the extracellular potassium have also been widely studied. Hyperkalaemia is a danger only in renal failure and after the injection or absorption of potassium salts. Miller and Darrow (1940b) observed that the toxic effects of injected potassium salts in experimental conditions are directly related to the increase in concentration of that cation in the serum, and only indirectly to the muscle potassium content. This was confirmed in cats by Crismon *et al.* (1943). Folk *et al.* (1948) confirmed that the serum potassium content accurately reflects the potassium content of the extracellular fluids. The effects of increments in the extracellular potassium were studied by Winkler *et al.* (1938). They showed that, in dogs, the electrocardiographic changes due to the toxic effects of extracellular potassium could be directly correlated with the serum potassium concentrations. Briefly they noted: (1) increased amplitude and reduced duration of the T wave regularly appeared at concentrations of 5-7 mM of potassium per litre; (2) depression of the ST segment at 8-10 mM per litre; and (3) intraventricular block began at concentrations of 10 mM per litre, the P wave disappearing at 9-11 mM per litre, and cardiac arrest ensued at 14-16 mM per litre.

By depleting the muscle potassium, Miller and Darrow (1940a, 1941) were able to show that rats could be made resistant to the toxic effects of injected potassium salts. They concluded that this depletion of cell potassium enabled this cation, when injected in excess, to enter the cell, thereby protecting the extracellular fluid from a lethal rise in concentration.

Normally the kidney prevents toxic increases in the potassium concentration in the extracellular fluid. The excretion of potassium, as indicated by Smith (1951), is complicated. Potassium reabsorption occurs in the proximal tubule, but it has been necessary to postulate tubular excretion in the distal system, and this, though normally slight, is increased in all conditions of increased extracellular potassium. As Smith points out, this is the first instance in which experimental evidence has made it necessary to postulate the simultaneous reabsorption and excretion of any substance by the kidney tubules. Durlacher and Darrow (1942) showed that the life of nephrectomized animals could be prolonged by procedures which had previously depleted the body potassium stores. They concluded that the mechanism of this prolonged survival was therefore due to the delay in the post-operative rise in the serum potassium. These experiments were in agreement with the clinical data already available, indicating that some of the toxic effects in renal insufficiency were due to an increase in the serum potassium concentration (Winternitz *et al.*, 1940; Addis and Lew, 1939).

The purpose of this paper is to attempt some correlation of these various facts about potassium exchanges in clinical conditions and to analyse the means of diagnosis at our disposal.

Clinical States of Potassium Deficiency

Deficiency may be induced by prolonged reduction in intake or by abnormal loss. In many conditions, such as surgical operation, diarrhoea, and pyloric stenosis, both these factors are operative, and hasten the onset of the condition. As has been indicated above, the work of Benedict and later observers has shown that the protein catabolism associated with starvation also increases the loss of potassium from the body.

The loss of body fluids containing potassium may also hasten the onset of potassium deficiency. Gastric juice contains about 16 mEq of potassium per litre as well as hydrochloric acid. The starvation associated with pyloric stenosis, resulting in diminished intake, increased urinary output, and potassium loss by vomiting is a good example of the forces acting to precipitate potassium deficiency. If, in addition, saline infusion is liberally used in treatment it is hardly surprising that symptoms of potassium lack become manifest. Deficient intake, loss by the gastrointestinal tract either as stomach contents or diarrhoea fluid, and excessive loss during starvation can all be readily understood, and measures can be taken to estimate the potassium loss and to employ replacement therapy. It is with the urinary potassium loss that we are particularly concerned here.

Tarail and Elkinton (1949) have shown that, even in deficiency states, the kidney appears to have a limited minimal excretion of potassium. Unlike sodium, therefore, the kidney seems unable to conserve potassium when it is most required. This continued excretion in the urine in a patient already depleted of potassium is an important factor in producing severe deficiency. It has also been shown that a major surgical operation markedly increases the excretion of potassium in the urine (Blixenkron-Møller, 1949; Wilkinson *et al.*, 1950). These writers have also shown that the phase of increased potassium excretion can be detected earlier than the phase of protein catabolism, and that the potassium loss is greater in proportion than the nitrogen loss. These effects are very similar to the experimental observations of Cuthbertson *et al.* (1939) on trauma in rats.

I have shown that this urinary potassium loss occurs also in the first three days after relatively minor operations such as interval appendicectomy and inguinal herniorrhaphy (MacPhee, 1952). In this series of patients the blood loss was minimal, hydration was adequate, and intravenous saline infusion was not necessary, thereby preventing the potassium loss shown by Gamble (1942)

to result from such treatment. This potassium loss may amount to as much as the equivalent of 10 g. of potassium chloride in the first three post-operative days. As a result of these observations and the associated sodium, chloride, and water retention, the eosinopenia, the increased 17-keto-steroid excretion, and the elevation in blood sugar in these patients, I have suggested that the electrolyte changes are the result of increased adrenocortical activity. It is probable that, provided the adrenal cortex is functioning, these metabolic changes are the natural response of the body to trauma. Such observations are in accord with the well-known hypothesis of Selye (1950), and, as he suggests, may occur in a wide variety of disease conditions and "stresses."

It is too early yet to say whether the increased potassium loss in such conditions as diabetic coma and other acute medical conditions is due to this "stress response" or not. Gamble (1942) has suggested from the work of Darrow that, in conditions of extracellular dehydration (as in infantile diarrhoea), potassium along with water is withdrawn from the cell. Wilkinson *et al.* (1950) suggest some similar mechanism to account for the increased potassium excretion after major surgical procedures. As I have indicated, however, this does not seem to be the operative mechanism in minor surgical trauma, as no appreciable changes were detected in the plasma volume or extracellular fluid space volume, and slight increases were detected in body weight, indicating water retention in the body. Further evidence in favour of the stress mechanism in acute medical conditions has been obtained by Prunty (1949), who observed evidence of increased adrenocortical activity in acute porphyria.

Diagnosis

Although there is no complete agreement on the mechanism leading to urinary loss of potassium in these widely disconnected conditions, the fact that potassium deficiency may supervene is now well recognized. The diagnosis of incipient potassium deficiency, however, remains difficult. The reasons for this have not been made clear. Apart from the electrocardiographic evidence, the signs and symptoms detailed above are often similar to the disease initiating the potassium loss. In addition, sodium chloride and water lack may precipitate cyanosis, abdominal distension, and peripheral circulatory failure, and must be considered as factors in addition to the concomitant potassium deficiency.

Concentrations of potassium in the serum below 3.5 mEq per litre are generally thought to indicate a deficiency of the cation. It is not generally appreciated, however, that the serum potassium concentration may be essentially normal when there is considerable cellular potassium depletion. I have now seen on several occasions electrocardiographic evidence of potassium deficiency associated with a "negative" potassium balance in the presence of a normal extracellular potassium concentration. Danowski *et al.* (1949), in accurate balance experiments, have shown that positive cell balances of potassium were recorded in patients who had normal serum levels of the ion. In the clinical experiments previously noted I have shown that the post-operative serum potassium concentration did not fall below 4.5 mEq per litre in my series, although a large increase had occurred in the urinary excretion of potassium. Frequently, indeed, the serum potassium was observed to rise during this phase. I believe this indicates that potassium is derived from the cells in the post-operative phase as rapidly as, or even more rapidly than, it is excreted by the kidney. This would account for the apparently anomalous findings of potassium deficiency in the presence of a normal or near-normal serum concentration of the ion.

In view of these observations and the experimental records cited above, it may be said that, in the early stages at least, the symptoms of potassium depletion are due to a reduction in the intracellular potassium and not in the serum potassium. It is therefore unwise to wait for biochemical evidence of potassium depletion in the serum before

considering potassium deficiency. Provided renal function is adequate, potassium deficiency must be expected in all patients who have undergone major surgical procedures, especially if oral feeding is not possible by the fourth post-operative day; if deficient potassium intake has occurred before operation; if potassium loss is augmented by vomiting, diarrhoea, dehydration, or saline infusion; and if potassium is not supplied at least in maintenance doses. If oral feeding is not possible the potassium loss in the urine, intestinal aspiration, and diarrhoea fluid should be estimated, and the appropriate quantity of potassium supplied.

One further point in regard to potassium deficiency needs to be mentioned. Low concentrations of serum potassium have recently been recorded in association with paralytic ileus. Streeten and Ward-McQuaid (1952) have published observations on this subject, but were unable to prove conclusively that paralytic ileus is always due to serum potassium deficiency. The paralytic ileus which results immediately on the perforation of a peptic ulcer is not associated with a serum potassium deficiency and it seems improbable that this should be the case. (In the absence of other evidence, a reflex "neurogenic" basis must be postulated.) Such a condition, if untreated, is rapidly followed by peripheral circulatory insufficiency due to sodium chloride deficiency which itself increases the ileus (Streeten and Williams, 1952). In the early stages such an ileus will recover rapidly after saline infusion. If, however, the ileus is allowed to persist untreated, the intestinal aspirations and the frequently associated operation may precipitate a potassium deficiency which will increase the tendency to ileus.

The fact that the early stages of potassium deficiency are not necessarily associated with a low level of serum potassium indicates that some method of determining the cellular potassium concentration is required. Electrocardiographic evidence is helpful. In the study of potassium loss after operation associated with normal serum potassium concentration I attempted to measure the erythrocyte potassium concentration (MacPhee, 1952). By estimating the serum potassium and the potassium content of lysed blood, and by utilizing haematocrit readings, the red-cell content can be measured. Although able to detect increases in the erythrocyte sodium immediately after operation, no constant changes were observed in the erythrocyte potassium. Such studies, though pursued in only a small series, seem to indicate that the erythrocyte potassium cannot be satisfactorily used as an index of muscle potassium content.

Treatment of Potassium Deficiency

Potassium deficiency states exist usually with deficiencies of other ions, and the object of treatment is to correct the total ionic imbalance rather than to correct any particular deficit. Any discussion of potassium replacement therapy alone must therefore, of necessity, be brief, and in general terms only.

If an adequate diet containing meat and vegetables can be taken there is little need to supply potassium by other means. If possible it is best to supply any potassium deficit by mouth, thereby allowing absorption as required and preventing a too rapid rise in the extracellular potassium concentration. Serious potassium deficiency, however, usually arises in cases in which oral feeding and therapy are not possible.

Elkinton and Tarail (1950) have estimated that the usual potassium deficiency encountered in the adult may vary from 228 to 936 mEq, roughly about 8-36 g. of potassium. They suggest that, if replacement therapy is to be undertaken by the intravenous route, no more than 20 mEq of potassium per hour in a solution with a maximum strength of 80 mEq per litre should be administered. As an example, a solution containing 4.5 g. of the monohydrogen phosphate (K_2HPO_4) and 1 g. of the dihydrogen phosphate (KH_2PO_4) added to a litre of water supplies 60 mEq of potassium per

litre. In severe deficiency states 250 ml. of this solution may be supplied each hour, provided adequate means of checking the serum potassium concentration are available.

A chloride deficiency in association with the potassium deficiency is often present in pyloric stenosis. In such cases potassium chloride (KCl) provides a suitable means of rectifying the cation and some of the anion deficiency. Each gramme of potassium chloride contains 13.4 mEq of potassium.

If the potassium deficiency is associated with severe sodium depletion, as in prolonged vomiting of intestinal contents, Darrow's solution provides a suitable method of treatment. This "K-lactate" solution contains 4 g. of sodium chloride, 2.7 g. of potassium chloride, and 52 ml. of molar sodium lactate per litre. The solution can be given in a four-hour period, but, as the potassium concentration is about ten times that of the serum, it is safer to prolong the administration over a somewhat longer interval.

It will be readily appreciated that the parenteral therapy outlined above cannot be followed unless renal function is adequate and unless the concentration of potassium in the serum can be rapidly estimated as treatment progresses.

Increased Extracellular Potassium

Unlike the effects of potassium deficiency, the toxic effects of increased body potassium are usually related to the extracellular concentration of the ion. As already indicated, the toxic effects can be correlated directly with the serum potassium concentration. As a result, the curious anomaly of potassium intoxication may occur during the treatment of cellular potassium deficiency. I have seen a case of pyloric stenosis in the late post-operative period complicated by paralytic ileus, and with an initial serum potassium concentration of 3.5 mEq per litre, showing signs of potassium intoxication as a result of too rapid parenteral replacement therapy.

In clinical practice increased concentration of potassium in the serum is encountered mainly in states of renal insufficiency and in oligaemic shock.

Anuria and Severe Oliguria

The experimental work on this subject has already been considered. In spite of the experimental evidence obtained by Durlacher and Darrow (1942), they did not believe that fatal increases in concentration in the extracellular potassium were the cause of death in anuria. In association with Winkler *et al.* (1938) they thought that the symptoms of potassium intoxication were totally different from those of uraemia.

The cause of the increase in extracellular potassium is an interesting problem. An exogenous source can be excluded, because the rise in the serum potassium can be observed when such patients are starved. Elkinton *et al.* (1949) showed that the rise in extracellular concentration was derived mainly from intracellular potassium. It has been assumed that this increase in extracellular potassium in the anuria associated with mismatched transfusion results from haemolysis and the liberation of potassium from the red cells. There are many objections to such a theory. The rise in serum potassium is rarely noticeable in the first day

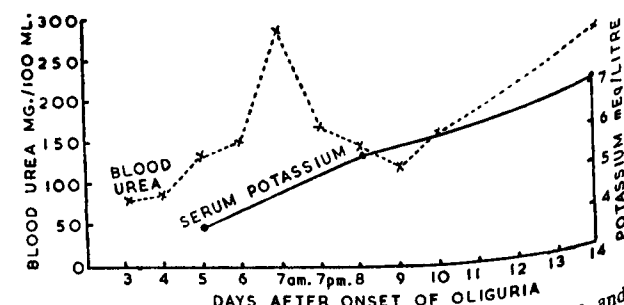


Chart showing effect of peritoneal dialysis on blood urea and serum potassium concentration in patient with severe oliguria.

or two after the transfusion. The Chart demonstrates this point in such a case, and shows that the rise is progressive in the later stages. The Chart also illustrates the effect of peritoneal dialysis in reducing the blood urea, but not in reducing the serum potassium concentration when a solution such as Ringer's is used as the dialysate. It is also interesting to note that the patient remained clinically well, though suffering from severe oliguria, until the eighth day, when symptoms of uraemia began to appear. At this time the blood urea concentration had been greatly reduced by dialysis, the carbon dioxide combining-power of the plasma had returned to 60 volumes%, and the plasma chlorides had risen to 82 mEq per litre. Though this is not direct evidence of potassium intoxication, the uraemic symptoms were certainly associated with the increase in the serum potassium. When recovery ensued after thirteen days' oliguria, the serum potassium rapidly returned to normal.

In view of the fact that the rise in extracellular potassium in such states is a progressive one, I believe that increased adrenocortical activity may be the cause of the potassium withdrawal from the cells. The "stress" origin of such a cell depletion would be in line with the mobilization of potassium from the cells after trauma, operation, and other tissue injuries. There is as yet, however, no real proof of this mechanism. The gradual rise in the serum potassium could be explained in other ways. For example, after crush injuries much potassium may be liberated from the damaged muscle. Potassium may also be derived from the cells during the protein catabolism of starvation. The mechanism therefore remains in doubt.

Treatment

Kolff (1950) has shown that *subnormal* serum potassium concentrations may actually be produced in uraemia in patients on a Borst diet (high carbohydrate, low protein). Fenn (1939) showed that potassium is deposited in the liver along with glycogen. Experimental evidence suggests therefore that after injections of carbohydrate a movement of potassium from the extracellular to the intracellular spaces takes place. This may be a part of the merit of a treatment such as that of Bull *et al.* (1949), in which a high carbohydrate intake is advocated.

If the extracellular potassium concentration has already reached toxic levels before adequate treatment is begun, some form of dialysis may be necessary. Intestinal dialysis as described by Black and Stanbury (1948) is a most suitable method of reducing the extracellular potassium concentration in such cases. Peritoneal dialysis is cumbersome, and may be dangerous.

Summary

Potassium deficiency may occur as a result of deprivation of the ion, by excessive loss though vomiting, by diarrhoea, or in the urine.

The loss is accentuated by saline infusion, operation, injury, and perhaps by other stress conditions.

The symptoms of potassium deficiency may occur when the serum potassium concentration is still within the normal range. The symptoms are therefore due to cellular potassium depletion.

The erythrocyte potassium concentration is not an index of the muscle-cell potassium content.

Symptoms of potassium intoxication are directly related to the extracellular potassium concentration, and not to the cell potassium content.

ADDENDUM.—In the recovering phase of renal cortical necrosis when diuresis ensues, it has always been our experience that excess potassium is rapidly cleared from the extracellular fluid. In a recent case, however, I have observed a potassium and non-protein nitrogen retention after the onset of diuresis. In this case the urine continued to approximate to a glomerular filtrate for several days. On

theoretical grounds it was believed that, in the presence of a satisfactory urinary output, the excess potassium and nitrogen would be cleared by giving cortisone. This was done, and a dramatic fall in the serum potassium and non-protein nitrogen was observed. If the urine volume had not been sufficient, however, it would have been dangerous to use cortisone.

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"Egg white is the most alkaline natural fluid known, having a pH of about 9.5; this high alkalinity confers on it a definite bactericidal character, which is enhanced by the presence of certain proteins, such as lysozyme, a known antibiotic. The pH of yolk is about 7, and the whole egg therefore should act as an electric cell or battery because of the difference in acidity between the yolk and the white. The yolk, having an excess of positive hydrogen ions over the white, as it is more acid, ought to be at a positive potential relative to the white and should correspond to the positive pole of a cell. This difference in electric potentials within an egg can be demonstrated directly with the aid of a sensitive galvanometer. . . . The potential difference between yolk and white varies considerably from egg to egg and with the age of the egg; it is about 1/10 of a millivolt."—From a lecture given by D. P. Riley, D.Phil., at the Royal Institution on November 7, 1952.

Serial sections have been examined, but they do not show any lesion of the blood vessels of the part. The appearances suggest a primary lesion of the muscle fibres, resulting in disintegration of the fibre, unassociated with vascular damage" (Figs. 1 and 2).



FIG. 1.—Haematoxylin-eosin ($\times 200$). Biopsy of gastrocnemius muscle showing localized necrosis of fibres surrounded by oedema and lymphocytic infiltration. One fibre is seen shrunken and separated from the sarcolemmal sheath.



FIG. 2.—Mallory's phosphotungstic acid haematoxylin ($\times 330$). Same specimen as Fig. 1 showing strictly localized necrosis of muscle fibre with loss of striation and staining. The unaffected part of the fibre and the surrounding fibres show well-preserved striation.

The Literature

Up to the time of our observation, we could find only six case histories of this disease. Two further cases were ascribed to this syndrome (Millikan, 1939; Bywaters and Dible, 1943), but in one a clinical description was not available, and in the other the diagnosis was retrospective after death. Since 1946 five further cases have been described, three of them in the same family.

We owe the first description of the disease to Meyer-Betz (1910).

A 13-year-old boy was admitted to hospital in a state of collapse and apparently moribund. The disease started suddenly with abdominal pain, bleeding from the nose, and vomiting. He became very weak and a few hours after the onset voided some black urine. The family history revealed nothing. His past medical history showed that at the age of 10 his urine appeared to contain blood for two days, but he was not obviously ill.

From that time he had "haematuria" once or twice a year, lasting for two days and associated with severe muscular weakness. About nine months before admission he had a more severe attack: he could hardly move and his urine was black. Four months before admission he had an attack of abdominal pain associated with severe weakness lasting for about 14 days. His mother noticed at this time that his legs and feet were swollen.

On examination the child could barely move. The lower extremities were more affected and were almost paralysed. The feet were in talipes equinus and the calf muscles contracted and hard. Passive movement of knee and hip caused pain. The elbows could not be straightened and there was limitation of wrist movement. The patellar reflexes were absent. All the muscles involved felt hard and tender to pressure. There was mild anaemia, with moderate leucocytosis.

The urine voided at the time of admission was chocolate-coloured and turbid, and showed a heavy deposit. There was some detritus, believed to be red cells, but no actual red cells were seen. A few granular and hyaline casts were also present. The test for albumin was strongly positive and spectroscopically the pigment resembled both oxyhaemoglobin and methaemoglobin. The output of urine was severely reduced during the first day, but its colour rapidly became paler and by the end of the second day the pigment had disappeared. At this stage hyaline, granular, and red-cell casts were seen in abundance. Gradually the urinary output rose and the child recovered. The contractures disappeared in this order: hands, flexors of left arm, flexors of right arm; last to disappear were the contractures of the most severely affected calf muscles. Within three months of the onset the child appeared to be normal again.

Two minor attacks involving only the calf muscles and leading to discoloration of the urine were also observed.

Meyer-Betz noticed the striking similarity between this condition and "paralytic equine haemoglobinuria," and, although unable to confirm the nature of the pigment, he was aware that myoglobin was involved.

The cases since observed closely resemble the first. The pattern is the same and the variation is only in the severity of the episodes. The Table summarizes the main features.

The onset is sudden. With minor attacks there is bilateral but not necessarily symmetrical involvement of the muscles of the lower limbs. The attacks, which are frequently repeated over a period of months or years, often follow exertion after a period of rest in bed. The calf muscles are most often affected; they are painful and feel wooden as if in tonic contracture. The feet are in the position of a ballet dancer, and the attack is followed within a few hours by transient myoglobinuria. The duration and intensity of myoglobinuria is proportional to the severity of the attack and to the extent to which the musculature is involved. It may well be that minor attacks are more common than hitherto believed, and are missed because the staining of the urine is not noticed. The attacks are not associated with neurological changes, either sensory or motor. There is no oedema or involvement of the overlying skin. The course is generally afebrile, except in severe attacks in small children. Normal red- and white-cell counts appear to be the rule, and the urine shows no red cells or stromata to account for the blood-stained appearance.

Major attacks differ only in extent. The involvement of muscles spreads upwards until all the skeletal muscles are affected; this leads to the apparent paralysis which is included in the name of the syndrome. Myoglobinuria is more intense and prolonged.

Even the most severe cases on record ended favourably; renal failure seems to be unusual. The attacks have a tendency to recur, but in several of the cases they became less frequent and ultimately disappeared. The remote prognosis is more difficult to assess. Case 1 was well—apart from some residual contracture of the calf muscles—a year later, when last seen. Case 2 had three lesser attacks in the next two years. We have been able to follow up Case 3 in France 16 years later, as her father is a medical practitioner. She had one severe and two milder attacks within three years of the onset, and then recovered completely. The other cases could not be traced.

Details of Cases in the Literature

Author	Case No.	Age	Sex	Family History	Course and Remarks
Meyer-Betz (1910)	1	13	M	None	History of several minor attacks. In hospital with very severe attack involving whole body. Later two minor attacks while under observation. Complete recovery a year later.
Hittmair (1925)	2	41	F	"	Onset with sudden major attack, starting in legs, ascending to trunk and arms. Recovery in 14 days. Second major attack a year later, followed by a lesser attack, and finally minor attack during following year. Recovery.
Debré et al. (1934)	3	21	F	"	Major attack with generalized paresis. Febrile. Calves most affected. 10 months later identical attack. Milder attack a year later and a minor attack after a further 3 months. Complete recovery.
Huber et al. (1938)	4	4	M	"	Single attack of medium severity affecting lower limbs. Slight fever. Recovery.
Louw and Nielsen (1944)	5	4	M	8 members of 5 generations affected by sex-linked recessive muscular disease starting in childhood. ?Progressive muscular dystrophy	History of repeated minor attacks involving calves only. Seen with minor attack at age of 10. Recovery. Myoglobin confirmed.
Scherwin (1945)	6	38	M	None	Three attacks with atypical distribution and course. Oedema and red skin over muscles involved. ?Polymyositis. Outcome not known.
Elek and Anderson (present case) (1946)	7	41	F	"	Single minor attack. Myoglobin confirmed. Recovery.
Hed (1947)	8	20	M	3 males of 6 siblings affected; 2 males healthy. No other family history of muscular disease. Mother diabetic	Several minor and some major attacks from age of 15. Attacks related to exertion on fasting. One mild attack observed. Abnormal sugar tolerance curve. Myoglobin in urine confirmed.
"	9	19	M	Brother of Cases 8 and 10	History of minor attacks from age of 16. Related to exertion while fasting. Abnormal sugar tolerance curve. Carbohydrate-free diet for 24 hours was followed by severe attack. Myoglobin confirmed.
"	10	18	M	Brother of Cases 8 and 9	History of minor attacks consisting of pain in legs and dark urine. Related to exertion.
Wissler (1948)	11	6	M	3 brothers suffered from a form of muscular atrophy. 2 died	Single attack of medium severity observed. Slight fever. Myoglobin confirmed.
Kreutzer et al. (1948)	12	39	M	None	History of repeated fleeting attacks. 3 attacks of medium severity observed. Attacks could be brought on by stretching of muscles. Myoglobin confirmed. Recovery, but no follow-up available.

Differential Diagnosis

The relative ease with which myoglobin can now be identified spectroscopically sets myoglobinuria apart from any form of haemoglobinuria. Although all of them are uncommon, there are several conditions known in which this pigment or its decomposition products appear in the urine. In all these the primary lesion is in skeletal muscle. If there is a sufficiently severe lesion of muscle and enough

circulation for absorption to occur myoglobinuria will ensue. Myoglobin is readily excreted by the kidneys (Camus and Pagnez, 1902); its threshold is stated to be about 20 mg. per 100 ml. Above this value its excretion in dogs is proportional to the concentration in the blood (Yuile and Clark, 1941), which means that myoglobin is cleared about 25 times more rapidly than haemoglobin. The least amount to produce visible discoloration of the urine is about 40 mg. per 100 ml. This rapid excretion explains why in all but the most severe and widespread lesions of muscle the staining of the urine is very transient.

The conditions in which myoglobinuria is one of the cardinal signs may be summarized as follows (modified from Björk, 1949): (1) Paroxysmal paralytic myoglobinuria; Haff disease. (2) Dermatomyositis with myoglobinuria; myositis following carbon monoxide poisoning; myoporphyria. (3) Progressive muscular dystrophy. (4) Traumatic myoglobinuria: (a) "crush syndrome"; (b) electrical high-voltage accidents; (c) arterial occlusion with ischaemia.

Haff disease is undoubtedly the commonest cause of myoglobinuria in man. It occurs in East Prussia (Starfinger, 1924; Ewig, 1924; Meyer, 1924), Sweden (Berlin, 1944), and Karelia (Basharina and Kyrochkina, 1949). Its clinical features closely resemble the condition described by Meyer-Betz, and the histological findings, described by Kaiserling (1932), consist of focal lesions of individual muscle fibres. The pigment in the urine has been identified as myoglobin (Assmann et al., 1933; Jeddoloh, 1939).

Dermatomyositis may also be associated with myoglobinuria, as in the case described by Günther (1924) and possibly also in Paul's (1924) case. In both the disease was characterized by rigors and high fever, and the severity of the muscular lesions was greater in the upper than in the lower extremities. Both terminated fatally. It may be that Scherwin's (1945) case should also be ascribed to this group, since there was oedema of the skin over the affected muscles. Myoglobinuria was not confirmed in any of these three cases, and the clinical picture was unlike that of paroxysmal paralytic myoglobinuria.

Carbon monoxide poisoning causes a severe form of myositis, sometimes with myoglobin in the urine (Günther, 1921, 1940; Brass, 1944).

Myoporphyria is less well established as a disease entity; cases associated with muscle atrophy and loss of myoglobin have been described (Vanotti, 1935-6; De Langen, 1943; Belloni, 1947). Similarly the relationship of progressive muscular dystrophy to paralytic paroxysmal myoglobinuria is at present undefined. The resemblance of the distribution of the lesions was noticed early (Meyer-Betz, 1910; Kreutzer et al., 1948). Louw and Nielsen (1944) found evidence suggestive of progressive muscular dystrophy in the family of their case and a similar family history in another case (Wissler, 1948). Furthermore, some authors are of the opinion that the primary injury in progressive muscular dystrophy is in myoglobin metabolism (Meldolesi, 1937; Meldolesi et al., 1939).

The only group of known aetiology is that of traumatic myoglobinuria. Originally observed in the first world war (Frankenthal, 1916), it was studied by Minami (1923) and Husfeldt and Bjerring (1937) and later most extensively by Bywaters and his associates (Bywaters, and Delory, 1941; Bywaters and Beall, 1941; Bywaters, Delory et al., 1941; Bywaters and Popjak, 1942; Bywaters, 1944; Bywaters and Stead, 1944). Severe crush injuries or physical punishment (Langen, 1946) may cause necrosis of muscle, which, if severe enough, terminates fatally through renal failure. High-voltage currents similarly cause damage to skeletal muscle, often to a greater extent than the external injuries would suggest. Myoglobinuria and renal failure have been observed (Fischer and Rossier, 1947; Fischer and Fröhlicher, 1947). Ischaemic necrosis due to arterial thrombosis, embolism, or even spasm may simulate the conditions of traumatic myoglobinuria (Bywaters and Stead, 1945).

Aetiology

Little is known about agents causing acute necrosis of muscle. Myoglobinuria is, however, a common condition in animals (Minett, 1935). One form affecting horses is known as "paralytic myoglobinuria" (Fröhner, 1884; Camus and Pagniez, 1902, 1904; Camus, 1903), and the pigment has been identified (Carlström, 1931). The large muscles of the hind part are most severely affected and the onset is sudden. In "enzootic myoglobinuria" of horses (Wirth, 1921; Hobmaier, 1926; Stang and Wirth, 1928; Deubel, 1932; Bédaride, 1933) the muscles of mastication are affected. There is stiffness and swelling but no paralysis. Draught oxen and young calves suffer from "white muscle disease" (Vawter and Records, 1947), while lambs and young pigs suffer from a form of acute muscular necrosis, but the pigment has not been found in the urine (Hobmaier, 1926).

Foxes suffer from a disease known as Chastek paralysis, while in districts afflicted with Haff disease cats and even birds may suffer from it. The so-called "intermittent paralysis" of horses is said to be due to thromboses in the abdominal aorta (Carlström, 1931).

While the chain of events starting with acute muscular necrosis and leading to myoglobinaemia and myoglobinuria can easily be traced in all these conditions, and in recent years much has been learned about the renal lesions accompanying this sequence, practically nothing is known about the aetiology of acute focal muscular necrosis. In equine paralytic myoglobinuria excessive lactic acid formation was blamed, and this suggestion is reflected by Hed's statement that in his cases abnormal carbohydrate metabolism was responsible. Since the mother suffered from diabetes, the association may well have been accidental. Furthermore, there is no evidence of faulty carbohydrate metabolism in any of the other cases (Kreutzer *et al.*, 1948). Millikan's observation regarding excessive blood potassium levels is likely to be the result rather than the cause. Nor is there convincing evidence that human paroxysmal paralytic myoglobinuria is a hereditary condition. Its course and the long-term good prognosis make it unlikely, but this point cannot be settled until more information is available.

The condition resembles Haff disease in its clinical course, the low incidence of uraemia, and the histological changes found in the muscles, and may be a sporadic form of it. Haff disease is epidemic and so far all the outbreaks have stopped before it could be decided whether a virus or a toxic agent was responsible. Eating tainted fish is believed by many to be the cause. In this respect it may be noteworthy that Chastek paralysis of silver foxes, in which there is severe damage to muscles, is due to feeding on certain raw fish. The symptoms of this disease can be produced experimentally by a diet deficient in vitamin B₁, and recovery follows administration of this vitamin. A substance, probably a protein, has been recovered from fish that inactivates vitamin B₁ (Ågren, 1944). So far intravenous aneurin has not been tried either in Haff disease or in paroxysmal paralytic myoglobinuria, but on the basis of this theory it should bring about rapid recovery. Apart from our case, there is no information available about the lesions in the muscle as they appear in the acute phase, since no biopsy has been taken in any of the other cases. In one of Hed's cases a biopsy between attacks showed no abnormality except for a little diffuse increase of fibrous tissue between the muscle fibres. This suggests that, whatever the aetiological agent, the paroxysms of myoglobinuria represent the onset of necrosis in the muscles, possibly aggravated by exertion.

Summary

Paroxysmal paralytic myoglobinuria is briefly reviewed and a case illustrating the syndrome described.

The disease occurs in minor and major forms, which differ only in the extent of the lesions. Minor forms are characterized by painful tonic spasms affecting the lower

limbs, mainly the calf muscles, followed within a few hours by transient myoglobinuria. This pigment is suggested by the colour and by the absence of red cells or stromata. Major attacks consist of pseudoparalysis of the whole body, and are rarer. The disease has a tendency to recur, but the prognosis is good. The pathological changes in the affected muscles consist of focal necrosis. The aetiology is unknown.

We thank Sir Claude Frankau for permission to publish this case; Professor Theo. Crawford for his pathological investigations and for the use of the photomicrographs; and Dr. J. C. White and Mr. T. Pringle for the biochemical investigations.

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In the second number of *Scientific Film Review* there are assessments of four medical films: "Dextran—The New Narrow Fraction" (Benger Laboratories Ltd.), "The Effect of Metallic Ions and Osmotic Disturbances on the Heart" (U.S. Information Service: Indiana University), "Gastric Secretion" (Imperial Chemical Industries), "The Mitral Valve" (Montefiore Hospital, New York), and "Senile Obliterative Arteritis of the Legs" (Ciba Laboratories Ltd.). There are also reviews of three films on human reproduction, intended for schoolchildren and others. *Scientific Film Review* is obtainable from the British Film Institute, 164, Shaftesbury Avenue, London, W.C.2. Annual subscription 5s., single copies 1s. 6d.

SPLENECTOMY IN THREE CASES OF MYELOPHTHISIC ANAEMIA

BY

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AND

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Myelophthisic anaemia, a comprehensive term denoting anaemia associated with reduced cell formation by the bone marrow and compensatory haemopoiesis in other organs, is generally accepted as the one absolute contraindication to splenectomy. The spleen is regarded as the main focus of the extramedullary haemopoiesis, and therefore essential for the maintenance of the patient's life.

This paper describes three patients with myelophthisic anaemia in whom splenectomy was performed. One of them benefited greatly from the operation, one temporarily, whilst the third, although not improved, did not appear to be materially harmed. It is suggested that the improvement caused by the splenectomy was due to the removal of an important haemolytic component of the anaemia.

Case 1

A white man aged 31 complained of having felt tired at the end of the day's work for a few weeks before coming to hospital in February, 1950. Food "felt too hard for his stomach," and on several occasions he vomited immediately after a meal. There was no blood in the vomit. His appetite diminished, but he noticed no loss of weight. During the five days before admission he felt increasingly weak and had three attacks of shivering and sweating. Since the age of 16 he had suffered from occasional epistaxes. About a year before admission these nose-bleedings occurred every morning for a period of a few months. In 1944 he contracted malaria while in the Navy, and he had what was possibly a second attack in 1946, and a recurrence three months before admission. In 1947 he was examined for life assurance and was told that his spleen was enlarged. Since then he had been aware of a lump in his abdomen, but had no pain in that region and noticed no alteration in the size of the lump. There was no relevant family history.

On examination the patient was seen to be well nourished, with a sallow slate-brown pigmentation of the skin. Small lymph nodes were found in the cervical, axillary, and epitrochlear regions. The spleen, firm but not tender, extended into the left iliac fossa and 2.5 cm. across the midline. The firm edge of the liver was felt 3 cm. below the costal margin. While in hospital he had an irregular fever occasionally reaching 102° F. (38.9° C.). No malaria parasites or leishmania protozoa were found in blood and bone-marrow smears. Wassermann and Berger blood reactions, blood cultures, and *Brucella* agglutination tests were all negative. Serum proteins and liver-function tests were normal, and there was no excess of bilirubin in the serum. Radiographs of the whole skeleton were normal.

On admission the blood findings were: P.C.V., 22%; haemoglobin, 7 g. per 100 ml.; leucocytes, 3,500 per c.mm. (neutrophils 62%, eosinophils 2%, lymphocytes 28%, monocytes 8%); platelets, 63,000 per c.mm.; reticulocytes, 2%. The blood smear showed marked anisocytosis and poikilocytosis. In the first smear no immature cells were found, but after a few days 2 normoblasts per 100 leucocytes were counted and a similar number were regularly seen afterwards.

Eight sternal and iliac crest punctures failed to produce bone marrow. A sternal trephine biopsy was therefore performed, and the histological examination of the material obtained showed some fibrous tissue and some cells resembling histiocytes, but no haemopoietic tissue.

Course and Treatment.—On February 22 the patient had a severe epistaxis which reduced the volume of packed red cells to 18%. He was given 3 pints (1.7 litres) of blood, and the next day the volume was 28%. One month later the volume had dropped to 22%. On March 30 he was given 4 pints (2.3 litres) of blood and left hospital. He was readmitted on May 18, when his packed cell volume had dropped to 15%. He was again given 4 pints (2.3 litres) of blood, which raised the volume to 35%. Subsequently he was treated outside hospital, where his condition steadily deteriorated. From information obtained it appears that he received 18 pints (10.2 litres) of blood during the next three months. On August 21 splenectomy was performed by Mr. M. Cole-Rous, acting in consultation with Dr. B. G. Shapiro. The spleen weighed 3,300 g., and histological examination showed the changes of Gaucher's disease, increased haemosiderin in the swollen histiocytes, and myeloid metaplasia. After the operation the patient's condition improved rapidly. He returned to work in October, 1950, and has since, without treatment of any kind, felt perfectly fit.

On October 20, 1952, more than two years after the splenectomy, a blood examination showed: P.C.V. 49%; haemoglobin, 16.2 g. per 100 ml.; leucocytes, 9,100 per c.mm. (myelocytes 4%, neutrophils 56%, eosinophils 2%, basophils 1%, lymphocytes 29%, monocytes 8%); platelets, 430,000 per c.mm.; reticulocytes, 6%. In the blood smear one erythroblast and three normoblasts per 100 leucocytes were counted.

Comment.—This patient presented with Gaucher's disease of unknown duration, a grossly enlarged spleen, a slightly enlarged liver, and a haematological picture of myelophthisic anaemia. In spite of numerous blood transfusions his condition deteriorated rapidly, but after splenectomy a dramatic improvement took place. More than two years after the operation he lives a normal life and his blood picture is virtually normal, although the leuco-erythroblastosis might be interpreted as evidence of persistent extramedullary haemopoiesis.

Case 2

A white man aged 66 was admitted on February 25, 1952, with a typical history of gout of eight years' duration: repeated attacks of excruciating pain and swelling of the metatarso-phalangeal joint of his left big toe, with occasional involvement of his left ankle and at one stage his left elbow. Undue strain, exercise, or alcohol might bring on the attacks, which responded promptly to the administration of colchicine. Within three weeks of the onset of the gout he began to feel tired and out of sorts and easily became short of breath. His doctor found "a large spleen and anaemia," and his blood count at the time was: red cells, 4,300,000 per c.mm.; haemoglobin, 12.2 g. per 100 ml.; white cells, 6,920 per c.mm. (neutrophils 65%, eosinophils 4%, basophils 1%, lymphocytes 27%, monocytes 3%). The peripheral blood smear showed anisocytosis, poikilocytosis, and an occasional normoblast. The platelets appeared to be normal. He was given iron by mouth, liver injections, and x-ray therapy to the splenic area, and, although the treatment did not materially alter his blood picture, he felt well during the following years, apart from his attacks of gout. Two months before admission he became increasingly short of breath. After an attack of whooping-cough the dyspnoea was even more noticeable, and this was his only symptom. There was no history of gout or other relevant diseases in his family.

On examination the patient was obviously pale. His joints appeared normal except for an enlarged olecranon bursa at the right elbow. No enlarged lymph nodes were felt. His blood pressure was 125/55 mm. Hg. The spleen was firm, smooth, not tender, and was enlarged to 13 cm. below the

costal margin. The liver was felt 5 cm. below the rib margin and appeared to be of normal consistence. Special investigations showed: Urine, normal; blood urea, 68, 47, and 28 mg. per 100 ml. on different occasions; serum uric acid, 7.8 mg. per 100 ml.; serum creatinine, 2.76 mg. per 100 ml.; serum albumin, 4.7 g. per 100 ml.; serum globulin, 3.1 g. per 100 ml.; serum van den Bergh, direct and indirect negative; thymol turbidity, 1; thymol flocculation, 1; colloidal gold, 0. Radiographs of the pelvis, femora, and skull were normal.

Blood examination showed: P.C.V., 25%; haemoglobin, 8.5 g. per 100 ml.; leucocytes, 2,500 per c.mm. (neutrophils 55%, lymphocytes 45%); platelets very scanty; reticulocytes, 2%. The peripheral blood smear showed anisocytosis, poikilocytosis, and occasional myelocytes and normoblasts.

Five attempts to obtain bone marrow by needle biopsy failed. Trephining of the sternum was done, and, surprisingly, the marrow was found to be extremely cellular and

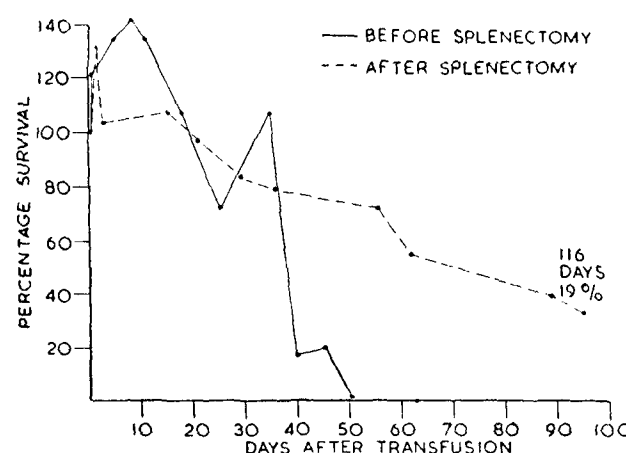


FIG. 1.—Red-cell survival curves of Case 2.

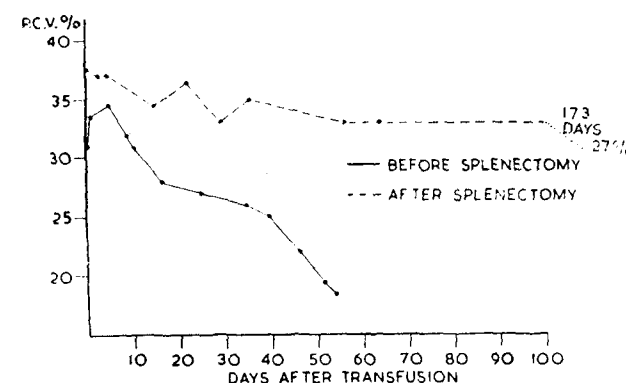


FIG. 2.—The packed cell volumes of Case 2 before and after splenectomy.

of normal composition. The differential count of the marrow gave this result: Myeloblasts, 0.66%; promyelocytes, 1.33%; myelocytes, 4.66%; metamyelocytes, 7.33%; eosinophil myelocytes, 0.66%; neutrophils, 33.33%; eosinophils, 1%; lymphocytes, 8.33%; monocytes, 1%; early erythroblasts, 2%; late erythroblasts, 13.66%; normoblasts, 26%. The report on the histology of bone-marrow sections read: "Histologically there is definite evidence of myelofibrosis. The trabeculae are thickened with prominent cement lines, and, whilst osteoblastic activity is on the whole slight, woven bone is being formed in some areas. Myelofibrosis, on the other hand, is absent, there being occasional foci only of plump fibroblasts. The bone marrow is very cellular, with numerous blasts and more mature cells of both red and white cell series. Megakaryocytes appear to be in excess."

Red-cell survival was estimated by the Ashby technique (Dacie and Mollison, 1943), and was found to be shortened (Fig. 1).

Course and Treatment.—Ferrous sulphate, 18 gr. (1.2 g.) daily, was given for two months without improvement of the patient's anaemia. He was given a transfusion of 4 pints (2.3 litres) of blood, which resulted only in a brief improvement (Fig. 2). After the transfusion his gout became worse and the dosage of colchicine had to be increased to control his acute symptoms. After further transfusion splenectomy was performed on May 2, 1952, by Mr. E. Malherbe. A small spleniculus, a lymph node at the hilum of the spleen, and a small piece of liver were also removed. The spleen weighed 1,600 g., and histological examination revealed pronounced myeloid metaplasia with gross excess of megakaryocytes. Evidence of blood destruction was shown by changes in the cells lining the splenic sinuses and the presence of altered pigment. A differential count on smears made from splenic pulp gave this result: Myelocytes, 6.33%; metamyelocytes, 6%; neutrophils, 12.66%; lymphocytes, 70%; monocytes, 1%; normoblasts, 4%. Numerous megakaryocytes were seen. The lymph node showed evidence of blood destruction by the presence of altered blood pigment and active macrophages, but haemopoiesis was trifling. The sinusoids of the liver contained a large number of megakaryocytes, but there was no indication of haemopoiesis.

The patient's gout flared up after the operation, but was controlled by three days' treatment with A.C.T.H. followed by colchicine. The survival rate of transfused red cells was now normal (Fig. 1); the improvement is also reflected in the almost steady packed cell volume without further transfusions (Fig. 2). The patient has felt well, and has been practically free of the symptoms of gout. A blood examination on October 21, nearly six months after splenectomy, showed: P.C.V., 27%; haemoglobin, 9.5 g. per 100 ml.; leucocytes, 38,000 per c.mm. (myelocytes 2%, metamyelocytes 7%, neutrophils 74%, basophils 1%, lymphocytes 16%); platelets, very numerous; 9 normoblasts per 100 leucocytes were counted.

Comment.—This patient showed the classical picture of gout combined with the syndrome of myelophthisic anaemia. The hyperplastic bone marrow in this combination is apparently rather characteristic (Reifenstein, 1945; Merskey, 1949), but in this case there was definite myelofibrosis. There was a very close association between the onset of gout and the beginning of the symptoms due to anaemia; furthermore, once the spleen was removed and the blood count stabilized the gout virtually ceased. It is likely that the gout was related to the intensity of the haemolytic process. The haemolytic element in the increasingly severe anaemia was clearly demonstrated by the short survival of transfused red cells, and the part played by the spleen in this phenomenon may be inferred by the return to normal of the red-cell survival time after splenectomy. This improvement was reflected in the clinical condition, and the patient lived a normal life. The remission was not complete and on October 23 he was readmitted for another blood transfusion of 6 pints (3.5 litres) of blood. Sixty-seven days after this transfusion he was again transfused with a similar volume of blood, but only 51 days elapsed before blood was again required. During the last transfusion period he was on continuous cortisone therapy (75 mg. a day after an initial loading dose).

Case 3

A white woman aged 58 was referred to hospital because of unexplained anaemia and splenomegaly. She had been given the usual haematinics without improvement and had been maintained only on blood transfusions. She had suffered from mild hypertension for years, and for the past four years had complained of general weakness. One year previously an obscure episode occurred during which she may have vomited a little blood. She thinks that her doctor did a venesection and removed a "a pint or two of blood." After that she was unable to walk for six months, and

then she slowly recovered a little. She could not recall losing blood in other ways. Her appetite had been poor for months.

On examination she was seen to be anaemic. Her heart was slightly enlarged and her blood pressure was 170/90 mm. Hg. There was no adenopathy. The spleen was firm and smooth, but not tender, and was enlarged to the level of the umbilicus. The liver was felt 5 cm. below the costal margin. Gall-stones were demonstrated by a cholecystogram, but the gall-bladder excreted the dye fairly well. Barium enema and two barium-meal examinations gave normal results.

Blood examination showed: P.C.V., 15%; haemoglobin, 6.4 g. per 100 ml.; leucocytes, 3,300 per c.mm. (myelocytes 1%, metamyelocytes 4%, neutrophils 33%, eosinophils 1%, basophils 1%, lymphocytes 58%, monocytes 2%); platelets, numerous; reticulocytes, 4%. The blood smear showed marked anisocytosis, poikilocytosis, and polychromasia. Two erythroblasts and seven normoblasts per 100 leucocytes were counted.

Marrow puncture was attempted in two areas of the sternum and in two sites on the left iliac crest. The fluid

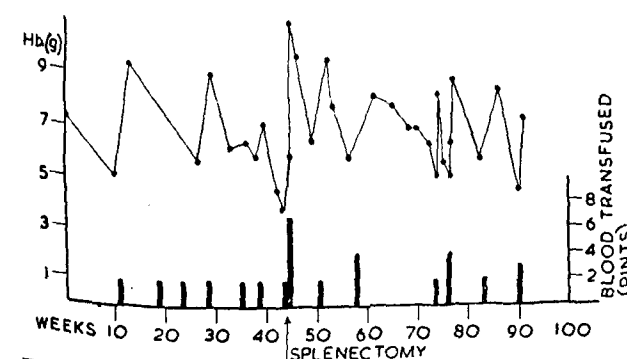


FIG. 3.—Haemoglobin levels and transfusion requirements before and after splenectomy in Case 3.

obtained appeared to be identical with the peripheral blood. Trephining of the sternum was done; smears made at the operation also appeared to be similar to the peripheral blood. Sections of the marrow showed the changes of myelofibrosis. The medullary cavity was traversed by thick bony lamellae and the scanty residual spaces contained some fibrous tissue, oedematous adipose tissue, a few osteoclasts, and an occasional lymphocyte and plasma cell. Myeloid cells were practically absent.

Course and Treatment.—The patient was kept under observation for some 40 weeks. Repeated blood transfusions were essential to keep her alive (Fig. 3). Splenectomy was therefore performed by Mr. J. Heselson. The spleen weighed 1,400 g., and the striking histological feature was active haemopoiesis, both myeloid and erythrocytic. Megakaryocytes were numerous. Erythrophagocytosis was slight, but there was an excess of haemosiderin pigment. The walls of the sinusoids were thickened, and within the sinusoids themselves haemopoiesis appeared to be proceeding. For a short time after the operation the patient felt a little better, but her blood-transfusion requirements remained unaltered (Fig. 3). Cortisone was tried in full dosage for six weeks without effect. The patient was still alive more than a year after the splenectomy, but her blood status had not improved.

Comment.—This was clearly a case of myelophthisic anaemia with myelofibrosis of unknown origin in which the patient could be kept alive only by repeated blood transfusions. Splenectomy did not improve the condition, but it did no harm.

Discussion

These three cases conform to the diagnosis of myelophthisic anaemia. The complete syndrome consists of a reduction of all the formed elements of the blood with some,

usually few, immature red and white cells in the peripheral blood—the so-called leuco-erythroblastosis. Bone marrow is difficult or impossible to obtain by needle biopsy, and when trephining is done the marrow is often found to be fibrosed or sclerosed and the cellular composition is characteristically similar to that of the peripheral blood. Areas of hyperplastic marrow may be found. The spleen is grossly enlarged and there is slight hepatomegaly. Splenic puncture may assist in the diagnosis by demonstrating the myeloid metaplasia (Moeschlin, 1951). Radiography of the skeleton may show increased density of the bones.

The commonest cause of the syndrome is encroachment on the bone marrow by foreign cells as in carcinomatosis or the lipoidoses, as in Case 1. Poisoning of the bone marrow by chemicals such as benzene or carbon tetrachloride may give rise to the condition; and, finally, a group of cases is found in which the aetiology is obscure, and this group has therefore been given a confusing array of descriptive names: myelofibrosis, agnogenic myeloid metaplasia, aleukaemic megakaryocytic myelosis, etc. Case 3 apparently belongs to this ill-defined group.

If the conception of hypofunction of the bone marrow with compensatory extramedullary haemopoiesis is correct it would seem logical to believe that the removal of the main focus of this haemopoiesis, the spleen, would be deleterious to the patient. Splenectomy in myelophthisic anaemia has therefore persistently been condemned (Downey and Nordland, 1939; Carpenter and Flory, 1941; Bodley Scott, 1949; Wintrobe, 1951; Learmonth, 1951; Moeschlin, 1951; Chatterjea, Arrau, and Dameshek, 1952; Whitby, 1952). When the operation has been carried out the results have been poor, if not disastrous. Hickling (1937) reviewed 27 reported cases: in 15 the patient died a few days after the splenectomy, while those that survived the operation did not improve and most were dead within a year.

As an exception to this general rule a few cases of myelofibrosis and myelofibrosis have been described in which splenectomy was beneficial (Engell, 1947; Edwards, 1951; Franks, 1952; Andersen and Sørensen, 1952), and of the three cases reported above one showed great improvement, one temporary improvement, and one did not deteriorate.

From the evidence presented, especially the rapid elimination of transfused cells in Case 2, it would seem that in some instances of myelophthisic anaemia an important element of haemolysis plays a part in the pathogenesis, and that this red-cell destruction may outweigh the haemopoiesis in the spleen. Whether this haemolysis is a manifestation of "hypersplenism" is an academic point beyond the present discussion. The important fact is the demonstration that in some cases of myelophthisic anaemia the overwhelming haemolysis may be arrested by the removal of the spleen and the patient's condition thereby improved.

The problem must now be to decide which cases to choose for splenectomy. Morrison *et al.* (1951) would limit the operation to cases in which splenic myeloid metaplasia is absent, but this criterion seems too rigid. If the patient is losing ground in spite of repeated blood transfusions, and especially if it can be demonstrated that the red-cell elimination is exceedingly rapid, the question of splenectomy should seriously be considered.

Summary

Three cases of myelophthisic anaemia are described—one due to Gaucher's disease, one associated with gout, and a third of unknown aetiology. The first was greatly improved after splenectomy, the second was temporarily improved, and the third, while little better, did not deteriorate.

Splenectomy is generally contraindicated in myelophthisic anaemia, but it is suggested that with evidence of rapid cell destruction, possibly demonstrated by a short survival rate of transfused cells, it is worth while considering splenectomy as a last resource.

We have to acknowledge the assistance given to us by Professor F. Forman, in whose department this work was carried out. The red-cell-survival studies were done in conjunction with the C.S.I.R. research unit (Professor J. F. Brock). The cases were in the charge of the following clinicians, and we are indebted for their constant co-operation: Drs. M. Cole-Rous, J. Heselson, W. P. U. Jackson, A. Landau, E. Malherbe, M. Nellen. The histological examinations were kindly carried out by Professor J. G. Thomson, Dr. G. Selzer, and Dr. R. G. F. Parker. We were both in receipt of grants for research expenses from the Staff Research Fund, University of Capetown. The work was done with support from the Lady Tata Memorial Trust.

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VALUE OF PRIMIDONE IN EPILEPSY

BY

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Since the introduction of primidone ("mysoline"; 5-phenyl-5-ethylhexahydropyrimidine-4:6-dione) as an anticonvulsant drug some two years ago, two papers have appeared on its use in the treatment of epilepsy. A report of its initial trial at the David Lewis Epileptic Colony was given by Handley and Stewart (1952). Of the 40 patients treated all of whom had had prolonged treatment with other drugs, 12 had complete abolition of all types of attack over the six-months period of trial, and a further 11 showed a reduction of two-thirds or more. Butter (1953) recorded his results also from a special hospital for epileptics, where 58 patients had been treated. Again all had had extensive previous treatment. During 15 months only 3% had their fits abolished, but 50% derived some benefit. The results in both these reports must be regarded as very promising in view of the type of case treated. The present paper records our experience in the treatment of both symptomatic and idiopathic epileptics from the routine out-patient practice of a neurological clinic.

Case Material

Seventy patients of whom detailed records were available are considered here, though a further 12 have been treated; 43 were male and 27 female, and their ages ranged from 4½ to 60 years. Twelve had post-traumatic epilepsy—four from closed head injuries and eight from brain wounds; 10 had symptomatic epilepsy from proved brain lesions such as neoplasm or vascular accident; the remaining 48 cases were regarded as idiopathic. In Table I the cases are grouped according to the predominant type of fit or fits that they had. However, all those listed as having focal fits did have

TABLE I.—Results of Primidone Treatment in Different Types of Epilepsy

Group	Much Improved	Im-proved	No Change	Worse	Total	Treatment Abandoned
1. Grand mal only	11	14	2	2	29	2
2. Grand mal and petit mal	1	5	2	0	8	0
3. Psychomotor attacks	0	2	2	0	4	0
4. Grand mal and psychomotor	4	2	2	1	9	1
5. Petit mal only	2	2	3	1	8	2
6. Focal attacks	2	4	1	0	7	0
Total	20	29	12	4	65	5

an occasional grand mal with the focal attack as an aura. The 31 patients in group 1 had mainly grand mal—10 with a definite aura; 8 (group 2) had both petit and grand mal; 4 (group 3) had psychomotor epilepsy; 10 (group 4) had psychomotor and grand-mal attacks; 10 (group 5) had petit mal only; 7 (group 6) had focal attacks—2 motor, 3 sensory, and 2 visceral.

Dosage.—This varied from 1.5 to 0.375 g. a day. At first a routine of three or four 0.25-g. tablets a day was used, but later an initial dosage of half a tablet thrice daily was adopted, as this produced less drowsiness. It was noted in some early cases that the substitution of primidone for phenobarbitone and sodium hydantoinate produced a modification of the attacks, but not always an actual reduction. As a result hydantoins were tried in conjunction with primidone, and the combination appeared to be more effective. In general, therefore, our initial dosage scheme has become primidone, 0.125 g. (2 gr.) and hydantoin, 0.05 g. (½ gr.) each thrice daily, and this is adjusted in the light of clinical response. A combination of primidone and barbiturates, though occasionally used, has often proved unduly soporific. Primidone alone, however, has been used in 15 cases, with definite improvement in seven.

In five cases toxic symptoms caused the drug to be abandoned in from 10 days to two months of the start of treatment. Of the remaining 65, 12 were treated for less than six months, 23 for six to 12 months, 16 for 12 to 18 months, and 14 for 18 to 24 months. All had had previous treatment, usually for some years, with barbiturates, hydantoins, and sometimes troxidone; and it was because fits continued despite this that primidone was tried.

Results

The results of treatment in each of the six types of attack are shown in Table 1. Those whose attacks were abolished or so reduced as to be negligible so far as their ordinary activities were concerned were regarded as *much improved*; when attacks were reduced by 50% or more they were regarded as *improved*. Reduction was assessed by comparison with the frequency during the year previous to starting primidone. Only those whose actual attacks were increased were labelled "worse," other toxic effects of the drug being considered separately. It will be seen that the best results were obtained in the grand mal and grand mal and psychomotor groups. There are, however, aspects of the drug's action which do not emerge from these figures alone. In groups 1 and 4 there was sometimes a striking improvement in general social behaviour—irritability and perverseness being noticeably reduced. Relatives often remarked on this, and it is important in assessing the drug's value as a remedy in epilepsy rather than solely as an anticonvulsant. In three of the four cases of group 5 who showed improvement, this was unexpectedly delayed. In one, for instance, there had been no improvement after three months and treatment was to be abandoned at the next visit two months later. However, by then attacks were beginning to lessen, and nine months after the onset of treatment they had been completely abolished.

TABLE II.—Results of Primidone Treatment in Traumatic, Symptomatic, and Idiopathic Epilepsies

Type of Epilepsy	Much Improved	Im-proved	No Change	Worse	Total	Treatment Abandoned
Traumatic	4	7	0	0	11	1
Symptomatic	0	5	4	1	10	0
Idiopathic	16	17	8	3	44	4

In Table II the results are compared in the idiopathic, traumatic, and symptomatic cases. There is no significant difference between the traumatic and idiopathic. Of the symptomatic ones, five (two improved, two no change, one worse) had a presumed progressive organic cause so that their poorer response was to be expected. These also weight the overall results in Table I.

In Table I cases are grouped on a clinical basis. However, since the electroencephalogram (E.E.G.) pattern appears to correlate more highly than the clinical description of the attack with response to the oxazolinediones, results are given in relation to E.E.G. records in Table III for the

TABLE III.—Clinical Results of Primidone Treatment in Relation to Varying Electroencephalogram Patterns

E.E.G. Pattern	Much Improved	Improved	No Change	Worse	Total
3 cps. wave and spike	3	2	1	1	7
2-4 cps. bilateral paroxysm	2	1	1	0	4
Generalized dysrhythmia	2	2	1	0	5
Localized or focal spikes	9	14	6	3	32
Atypical wave and spike	4	9	3	0	16
Bilateral theta paroxysm	0	1	0	0	1
Normal record	0	1	0	0	1
Total	20	29	12	4	65

65 patients who continued treatment. There does not seem to be any great difference in the clinical response of the varying E.E.G. patterns.

Those cases with localized or focal spike discharges and atypical wave and spike rhythms most often had these abnormalities in leads from the temporal regions. Clinically, also, they showed a high incidence of psychomotor attacks and the milder conduct disorders sometimes associated with epilepsy. In general, therefore, they represent what have recently tended to be described as "the temporal lobe epilepsies." The record of some improvement in 23 out of the 32 cases is therefore of special interest.

When alterations in seizures are considered in detail in a given case an interesting point emerges. In grand mal attacks with an aura, the grand-mal element may be controlled while the aura continues or even becomes aggravated. In one patient a series of brief sensory attacks in one arm usually lead up to a grand-mal convulsion. For the first few weeks of treatment the sensory attacks became prolonged, so that for some 12 hours a continuous sensation occurred, similar to the previous attacks, but no grand mal developed and the sensation slowly cleared. Addition of hydantoin curtailed this aura, and some months later there were no grand-mal attacks and only occasional brief sensory attacks. A similar effect was noted in three other patients. In one the prolongation of an abnormal sensation was so unpleasant that she refused to continue the drug.

Toxic Effects

In general primidone seems singularly free from toxic effects, and when they occur they are usually mild and transient.

Routine blood counts and urine tests were done in the first 15 patients, but as they showed no abnormality they were abandoned for subsequent cases. Thirty-six patients complained spontaneously of drowsiness at the start of treatment. A further 22 mentioned this in reply to questions. It usually cleared in a week or two, but 12 patients

were still troubled by it months later. A few also described mild confusion and inability to concentrate. In three this was so marked as to constitute a mild confusional psychosis, and in all three of them paranoid trends appeared. In two the drug was abandoned because of this and in the third it was restarted in a smaller dose, with benefit. Two patients had an urticarial rash soon after starting the drug; blood counts were normal and the rash did not reappear when the drug was begun again after an interval. Transient nausea, giddiness, and ataxia occurred in four cases, and, in one, treatment had to be given up. In two vomiting was troublesome: one refused to continue the drug because of this, the other continued with a smaller dose after an interval, with no return of sickness.

Two patients who omitted the drug abruptly and without medical advice developed marked increase in their grand-mal attacks—in one amounting to a mild status epilepticus. It seems best to curtail primidone gradually if possible. In this respect it may be similar to the barbiturates and hydantoins, and unlike troxidone, which does not carry this risk of provoking status epilepticus if stopped suddenly.

Apart from the five cases in which treatment was given up early for the reasons mentioned above, in four it was omitted after three to six months because the fits seemed to be worse; and in a further ten, after a trial of six to nine months, as there was no improvement.

Conclusions

Primidone seems to be of some value in all types of epilepsy. However, the impression is gained that it is less useful in petit mal than in grand mal, while the proportion of psychomotor cases which are improved is especially gratifying, since this type is usually resistant to other anticonvulsants. It may be that it will find a special application here; though more prolonged experience is required, because temporary improvement from any change of drug has so often been misleading in the past.

Apart from its anticonvulsant action, it seems to benefit the milder behaviour disorders, those angularities of conduct from which some epileptics seem to suffer. The relatively high incidence of these in the "temporal lobe epilepsies" suggests that neuronal circuits in this region may be especially implicated and that the drug may act specifically on these. Its evident though mild soporific effect, since this is shared with other anticonvulsants, cannot wholly account for the benefit.

The results reported here are the more striking because this series is a highly selected one, most cases having failed to respond adequately to all the usual anticonvulsants. However, the absence of any serious toxic effects suggests that primidone should be given adequate trial as the drug of first choice in the routine treatment of epileptics.

Summary

Results of primidone treatment in 70 cases of epilepsy whose response to other anticonvulsants had been unsatisfactory are given—48 were idiopathic, 12 traumatic, and 10 symptomatic. Thirty-one had grand mal, eight mixed grand and petit mal, 10 petit mal only, 14 psychomotor attacks with or without grand mal, and seven focal attacks. Forty-nine cases showed improvement, and this occurred in all types of attack. In view of the usually poor response of psychomotor attacks to anticonvulsants, some improvement in eight out of 13 patients who continued treatment is of special interest. Toxic effects are usually mild and transient. In five cases they caused early cessation of treatment, in two probably unnecessarily.

Thanks are due to Imperial Chemical Industries Ltd. for early supplies of the drug for clinical trial; and to Miss F. M. Taylo and Miss F. Boselli for taking the E.E.G. records.

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PARAPLEGIA DUE TO PAGET'S DISEASE (OSTEITIS DEFORMANS)

BY

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Osteitis deformans, or Paget's disease, may affect any part of the skeleton in those of older years. While involvement of the spinal column is frequent, it is unusual for compression of the spinal cord to be produced. It is probable that this complication is commoner than the literature would indicate, as it occurs in an age group in which accurate assessments of the nervous system are rarely made. Two cases are described and their relationship to the usual pattern of the disease discussed.

Case 1

A woman aged 64 was admitted to Dunedin Hospital on January 21, 1952. Three and a half years ago she had begun to notice a nagging pain in the small of her back. This was followed by increasing pain in the hips and knees. About a year ago she had had burning pains in both legs, and her feet had felt numb and lifeless. Walking had become difficult, and eventually she had had to use two sticks. For a year her balance had been bad and she had had numerous falls, in spite of the sticks. She had not noticed that her legs were really weak until six months ago, when she found that she could not lift them up to get into a motor-car. Her left leg had had spasms, when it would cross over the right. She had had increasing trouble with her micturition for six months. Sometimes her water ran away without control and at other times she had great difficulty in passing it. At the time of admission she was getting about the house with difficulty. She had consulted Sir Robert Jones for bow legs at the age of 13.

On examination she was seen to be a short woman with marked bow legs. Her heart was moderately enlarged; her blood pressure was 130/65 mm. Hg. The jugular veins were not engorged. There were crepitations and rhonchi throughout both lung fields. Her ankles were not swollen, the liver was not palpable, and there were no clinical manifestations of any neoplasm. She had a moderate lower thoracic kyphosis with a slight scoliosis to the left. Apart from slight deafness the cranial nerves were normal. Both legs were very spastic, with adductor and flexor spasms that were severest in the right leg. All movements were present in the lower limbs, but the power was very poor. There was a pronounced level of hypalgesia to all forms of sensation at L1. This faded off and there was hypalgesia at T8 on the right and at T11 on the left. Vibration was absent over the spinous processes up to T10. The lower abdominal responses were absent but the upper ones were present. The tendon reflexes in the legs were exaggerated, but no clonus was obtained. Both plantar responses were extensor.

The blood picture was normal. Serum alkaline phosphatase was 12.8 units. Lumbar puncture showed a pressure of 120 mm. H₂O with a slight rise to jugular compression. The fluid contained 10 polymorphs per c.mm. and 80 mg. of protein per 100 ml. X-ray examination showed: fine osteolytic stippling of the skull; minor congestive changes in the chest; increased size of heart as in pulmonary heart disease; a mixture of sclerosis and osteoporosis of T9 and T10 with slight collapse, and similar changes at L3 (? osteitis deformans, ? secondary carcinoma); normal lower limbs. A myelogram from below showed a complete block at T11.

Operation. This was performed on January 24 (anaesthetist, Dr. J. Ritchie). To supplement the general anaesthesia, hexamethonium bromide was used as a hypotensive

agent. A low thoracic incision was centred over T10 and T11. In separating the muscles there were numerous small blood vessels passing from the muscles to the bone that had to be controlled. The laminae and spines of T9 and T10 were massive. The laminae of T9 and T10 were completely removed and part of those of T8 and T11. The thick bone was soft and very vascular. When the bone had been removed it was obvious that there was a small kyphus with its apex at T10. The spinal theca was opened and appeared commodious. There was no evidence of any tumour, and it was possible to pass a fine rubber catheter for 8 in. (20 cm.) upwards and downwards without any difficulty. The dura mater was sutured and the wound closed in layers. It was not necessary to give a blood transfusion. The pathological report (Dr. R. Rodda) on the removed bone showed the typical changes of osteitis deformans.

After the operation there was slow improvement. When discharged home on April 2 the patient was able to walk but still used two sticks; bladder function was normal; tone of both legs was normal and the power slightly reduced; pain and temperature were felt everywhere; cotton-wool sensation was diminished in both feet; vibration was absent up to the anterior superior spines; position sense was very deficient in the ankles and toes; knee- and ankle-jerks were increased; the abdominal responses were all present; the plantar responses were extensor and there was knee and ankle clonus in the left leg.

When re-examined on June 5 she was walking well and used only one stick. Movements of the knees were still a little weak, the left more than the right. There was a trace of ataxia in the left leg. Vibration was absent in both lower limbs, but all other forms of sensation were normal. The right plantar response was flexor and the left extensor. Moist sounds were heard all over the chest.

Case 2

A man aged 65 was seen in consultation on October 16, 1951. In 1941 he had had an attack of congestive cardiac failure. At that time it had been noticed that he had an advanced osteitis deformans of the skull and spine. During 1945 he was admitted to hospital again, complaining of difficulty in walking. It was noted that both legs were weak and ataxic. All forms of sensation were poorly appreciated in the legs. The knee-jerks were absent and the plantar responses were flexor. By 1947 the weakness of his legs had increased and there was bowing of the right femur. X-ray films of both thighs showed severe osteitis deformans. He was fitted with a spinal brace. In 1949 he was admitted to hospital with retention of urine. The prostate was normal to palpation. Cystoscopy showed a fibrous bladder-neck and marked sacculation of the bladder. His bladder function improved and no active treatment was given.

He was again admitted to hospital in 1950 with urinary retention, and a transurethral resection of the prostate was done. A microscopical examination of the fragments showed senile hyperplasia. In spite of the resection he continued to have difficulty in passing his water. In the previous six months his leg weakness had rapidly increased and he had become bedridden. He had frequent attacks of breathlessness.

On examination he had a noticeably enlarged head and a very big right femur. His spine was rigid and there was an upper thoracic kyphosis. He had paraplegia in extension and was not capable of any voluntary movement in the legs. There was a marked hypalgesia to all forms of sensation to T11. The abdominal responses were absent. The plantar responses were extensor and there was bilateral ankle clonus. His bladder was palpable at the umbilicus. The blood pressure was 200/100 mm. Hg, and the apex beat of the heart was felt 1 in. (2.5 cm.) outside the nipple line. There was considerable oedema of both ankles and he had severe dyspnoea on slight exertion. X-ray examination at that time showed gross osteitis deformans of the right scapula, pelvis, femurs, lumbar spine, thoracic spine,

and tarsal bones. There was left ventricular enlargement. A diagnosis of paraplegia due to osteitis deformans of the spine was made. In view of his poor condition he was regarded as unfit for laminectomy, and a gloomy prognosis was given.

He was seen next on August 28, 1952. There had been some improvement in his general health. He no longer had attacks of breathlessness, although his ankles swelled intermittently. He had not walked for about eighteen months. He was able to pass water, but it often leaked away, and there had been attacks of cystitis. Both legs were painful and his buttocks were uncomfortable. He had noticed that his head was still getting bigger and that his dentures no longer fitted. He was a permanent inmate of a "chronic" hospital.

On examination his blood pressure was 220/120 mm. Hg, and the apex beat was felt 1½ in. (3.8 cm.) outside the nipple line. There was no evidence of any congestive cardiac failure. His bladder was palpable at the umbilical level. He had a marked upper thoracic kyphosis. His head was big and the right femur was massive. There was a complete paraplegia in extension. There was considerable hypalgesia for all forms of sensation to T7 on the right and to T11 on the left. The abdominal responses were absent and the plantar responses were extensor. Fresh x-ray films showed that the disease had progressed and that the lumbar spine was ankylosed. The cervical spine was normal. Further, many ribs and the tibiae and fibulae were affected.

The paraplegia was of such long standing that little could now be expected from decompression of the spine. The cardiovascular reserves were small and so no operative treatment was advised.

Literature

In 1877 Sir James Paget described the bone disease that bears his name. Thereafter sporadic cases were recorded in which neurological symptoms had complicated osteitis deformans. Wyllie (1923) gave the first verified account of spinal-cord compression due to osteitis deformans of the spine. Kay, Simpson, and Riddoch (1934), besides having had two cases of paraplegia in 34 cases of osteitis deformans, had seven other cases with less severe neurological signs. Schwarz and Reback (1939), Turner (1940), and Teng, Gross, and Newman (1951) have surveyed the literature. The total number of published cases was 37. Further cases have been published, and Petit-Dutaillis (1951) gave details of three cases treated operatively. Fairburn (1951) had a case in which symptoms recurred after successful laminectomy and which was improved by further operation. Godlewski (1948) had a case of cervical spinal-cord compression successfully treated by head traction with skull callipers. With the above two instances, the total number of published cases of compression of the spinal cord due to osteitis deformans is 44.

Discussion

Teng *et al.* (1951) gave the incidence of paraplegia as 1 out of 131 cases of osteitis deformans, on hospital admissions. The true incidence would be much less, as osteitis deformans is diagnosed commonly without recourse to hospital admission. Gutman and Kasabach (1936) found 59 cases of osteitis deformans in the wards and out-patient department of a hospital that treated 200,000 new cases in the same period. Some cases were symptomless and the radiological changes were found in the course of examinations for other conditions. Osteitis deformans occurs equally in the two sexes (Kay *et al.*, 1934; Gutman and Kasabach, 1936). Spinal complications have usually been recorded in males. Case 1 is exceptional in being female, and is the fourth such case. The age spread has been from 36 to 77 years, with a maximum incidence in the sixth and seventh decades. In the spine, Paget's disease is most frequent in the lumbar vertebrae and then in the thoracic vertebrae; affection of the cervical spine is uncommon

(Gutman and Kasabach, 1936). Paraplegia develops mainly in patients with thoracic spine involvement. Wyllie (1923) showed that there was an overall enlargement of all components of the vertebrae with the exception of the spinal canal. This was consistently narrowed. The most frequent site for the paraplegia was in the upper half of the thoracic spinal cord. Schwarz and Reback (1939) indicated that, for the whole spine, the interpeduncular spaces were narrowest between the third and tenth thoracic vertebrae. There is the additional factor of a kyphus due to collapse of the softened body of the vertebra. This is well shown in Case 1, in which the spinal-cord compression occurred at the apex of a small kyphus. The vertebrae affected were the ninth and tenth thoracic, which is lower than usual. The roominess of the lumbar spinal canal is the reason why narrowing in this area rarely causes nervous signs. Case 1 had incidental involvement of the third lumbar vertebrae, but a rubber catheter was able to pass this site without difficulty. It is rare for the whole of the thoracic and lumbar spines to be affected, as in Case 2. The ultimate fusion of the adjacent vertebrae occurs when the intervertebral disk is replaced by the pathological bony process (Turner, 1940).

The usual history is of a slow and persistent interference with the functions of the spinal cord. The onset is insidious, and may be masked by the pains and failing mobility that characterize many cases of osteitis deformans. The duration of symptoms has been a year in most cases. Both of the above cases had long histories; in Case 1 it was three and a half years, and Case 2 had had osteitis deformans for seven years and neurological symptoms for six of them. Otherwise the progression of symptoms was typical in both cases. It was unfortunate that more attention was not paid to the nervous system in Case 2 when the bladder symptoms became troublesome. There are no special features of the spinal-cord compression except for the predilection for the upper thoracic segments.

The radiological features of osteitis deformans are well known. In Case 2 the emphasis was on an osteoporotic expansion of the many bones involved. There was radiological evidence that the whole lumbar spine was ankylosed. It may be difficult to differentiate the localized form of osteitis deformans from secondary deposits due to cancer. In Case 1 there was a combination of a sclerosis and a porosis with expansion of the pedicles, arches, and spinous processes of the affected vertebrae. On radiological grounds a carcinomatosis of the spine could not be excluded.

The condition most likely to cause confusion in the diagnosis is a benign spinal-cord tumour. Infective processes and malignant tumours cause a more rapid disintegration of nervous function. Turner (1940) pointed out that usually it was not the clinically obvious case of osteitis deformans that developed paraplegia. Although there may be evidence of a widespread bony involvement on radiography, the radiological features are typical enough to make the diagnosis reasonably certain. The presence of deafness is an additional diagnostic feature in many cases. All the clinical evidence in Case 1 pointed to a non-tumorous cause, in spite of the radiological uncertainty. While Case 2 has not been confirmed operatively, the long history and the affection of so many bones leave little doubt that the paraplegia is due to osteitis deformans of the spine. Among the recorded cases of paraplegia due to osteitis deformans the association of this condition with a benign spinal-cord tumour does not seem to have been made.

The only satisfactory form of treatment is removal of the affected spinous processes and laminae of the vertebrae. Myelography is desirable as a pre-operative measure, to confirm the level of compression and to exclude another lesion. When many vertebrae are implicated it may not be expedient to do an extensive laminectomy, and myelography would show the site of compression. The laminectomy can be very bloody owing to the vascular nature of the diseased bone. These patients come into an age group in which cardiovascular and respiratory diseases are

common. Osteitis deformans is associated with a special form of heart failure due to high output (Edholm, Howarth, and McMichael, 1945). The results of laminectomy depend on the duration of symptoms, and little improvement will occur when the paraplegia has been present for a long time. Out of the 44 cases in the literature, laminectomy was done 25 times, with three (12%) deaths, and 18 cases have shown improvement after surgery. An important complication is the recurrence of the paraplegia after the initial relief. This has happened in at least three cases.

Case 1 had chronic bronchitis and pulmonary heart disease, but she tolerated the operation well. Her recovery from the paraplegia was slow, but at the end of five and a half months she had only slight neurological deficiency. Case 2 was not operated upon when first seen, owing to his congestive cardiac failure and poor general condition. It was surprising to find him alive ten months later. Although his cardiovascular state has improved, he has been bedridden for eighteen months. It is extremely unlikely that any improvement in his paraplegia would occur if decompression was done at this date. The general risk is considerable and it has been decided that he should not be submitted to operative intervention. Sarcomatous change is a real contingency that cannot be obviated.

Summary

Two cases of paraplegia due to osteitis deformans of the spine are described.

The literature is brought up to date.

The differences between the two cases and the general pattern of the disorder are discussed.

I am grateful to Dr. John Willis, of Palmerston North, for referring Case 1 and to Dr. Ian M. Macgregor, medical superintendent, Silverstream Hospital, for access to the clinical notes of Case 2.

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The results of the first real test of the Emergency Bed Service's warning system are considered in the report of the service for the year ended March 31, 1953. The year under review includes the great London fog of last December, which resulted in a quite unprecedented rush of applications, and this was followed at the end of January by the influenza epidemic. Throughout this time of crisis, the warning system worked remarkably well, but the report says: "Although an outstanding success, experience has shown, however, that improvement is possible. At present the issue and cancellation of the warnings is solely dependent on the admission rate, and the winter has shown that this tends to result in the warning being put on rather too late and taken off too early. A modification of the scheme is being worked out whereby account is taken not only of the admission rate, but also of the number of applications being received and of the number of admissions made only after referring the case to the medical referees." Applications over the year as a whole increased, and analysis tends to confirm that this was owing to a rise in sickness rather than in the number of doctors using the service. The report also contains numerical details of the applications and admissions during the year.

RECURRENT GALL-STONE ILEUS

BY

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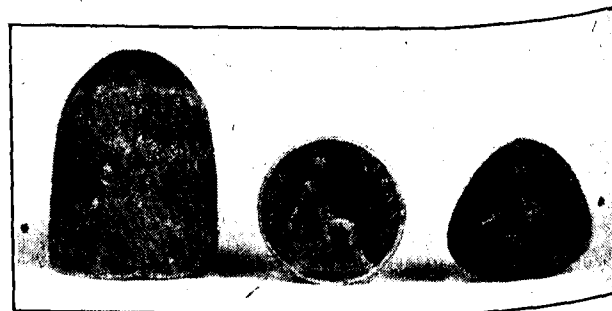
Gall-stone ileus is stated by various authorities to be the cause of 1-2% of all intestinal obstructions (Illingworth and Dick, 1941). Vick (1932) found that in over 6,000 cases of intestinal obstruction 0.68% were due to gall-stones. The high mortality, said to be over 50%, is due to delay in diagnosis and to the advanced age of the patients. Few of the reported cases were diagnosed pre-operatively. Several cases have been reported with multiple stones in the small intestine, but in only a small minority has a second intestinal obstruction occurred. Maurice Lee reported such a case in 1945. The stone usually ulcerates through between the gall-bladder and the duodenum, where it passes down into the small intestine, becoming impacted at the lower ileum. Wakefield, Vickers, and Walters (1939) in 141 post-mortem examinations found the fistulous track in 101 cases.

Case History

A housewife aged 57, 1 para, was seized by violent epigastric pain followed by vomiting two days before admission. These symptoms soon eased but returned on the day of admission, the pain this time being colicky in nature and central in situation. It was associated with severe and persistent vomiting. There was no relevant previous history apart from a dislike of fatty foods.

On examination the patient was dehydrated, with a dry, furred tongue. The abdomen was slightly distended, and on auscultation continuous loud peristaltic sounds were heard. Two enemas were given with negative results. After a diagnosis of acute intestinal obstruction of unknown causation, a laparotomy was performed.

First Operation (J. A. M.).—A distended loop of small bowel presented itself through a right middle paramedian incision. This loop contained a gall-stone which was impacted about 2 ft. (60 cm.) from the ileo-caecal valve. As it was too hard to crush, it was milked up into the distended loop and removed through a longitudinal inci-



Photograph of the two gall-stones.

sion. No other gall-stone could be felt in the small intestine. The gall-bladder area was not examined. Up till the ninth day the post-operative course was uneventful. The patient was taking nourishment and her bowels were working normally. On the tenth day, however, she complained of epigastric pain and vomiting. During the following 10 days she had attacks of incomplete intestinal obstruction, with colic, vomiting, and constipation one day followed by the passage of diarrhoea and flatus the next. It was thought that she had a post-operative obstruction due to local peritonitis and kinking, and attempts to relieve it by intestinal decompression were made. By the twentieth day it was decided that as she was not improving a further laparotomy should be performed.

Second Operation (Mr. W. J. M. Brandon).—The abdomen was opened through the previous wound. A second much larger stone was removed from the same area as before. The post-operative course this time, though slow, was uneventful.

The first stone was pyramidal in shape, faceted at its base, and 1 in. (2.5 cm.) in diameter. The second stone was shell-shaped and 1½ in. (3.8 cm.) in diameter (see photograph).

Comment

In this case the stones must have been lying silent for some time in the gall-bladder, the smaller stone ulcerating through first, the larger one taking 10 days longer to force its way through the preformed fistula's track. If the significance of the large facet on the base of the first stone had been realized, an earlier diagnosis of the post-operative symptoms could have been made. Both these stones were radio-opaque, as tested post-operatively. This is unusual. The sex of the patient, the lack of previous history, and the intermittent type of intestinal obstruction are typical features of this condition.

Summary

A case is reported in which 20 days after an operation for gall-stone ileus a second stone was removed from the small intestine. The patient eventually recovered.

I would like to thank Mr. W. J. M. Brandon, consultant surgeon, Law Hospital, for his help and permission to publish this case.

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Medical Memorandum

Mercuric Chloride Poisoning Treated with Dimercaprol

Mercuric chloride poisoning with suicidal intent is fortunately no longer fashionable in this country, although it still seems to be common on the Continent and in America. While Longcope and Luetscher (1949) in America reported on 61 cases of mercuric chloride poisoning treated with dimercaprol (B.A.L.), collected over a period of three years, no reports have, to my knowledge, been published in this country. It therefore seems of interest to make known the following case.

CASE REPORT

A man aged 37 swallowed 2 g. of mercuric chloride with suicidal intention at 1 a.m. on May 6. He vomited repeatedly shortly after taking the tablets, but the vomit is said not to have contained solid particles of the substance, but only to have been stained blue. About one hour later he passed a large amount of pale urine and began to have cramps in his hands and feet. At 10 a.m. he had violent abdominal colic with bloody stools. He then took fright and sent for a doctor. He was admitted to hospital one hour later.

He was seen to be a rather underweight man of slender build, but there was no evidence of shock and no gingivitis; the tongue was coated but not dry. The pulse was regular and the blood pressure 110/80. The bladder was not palpable suprapubically, but no urine had been passed since 2 a.m. He complained of some abdominal colic and of painful cramps in his limbs.

He was given an immediate injection of 100 mg. of dimercaprol, and two hours later a further 200 mg. The injections were repeated at four-hourly intervals for four doses, and then 100 mg. was given four-hourly for a further four doses. The patient reported very shortly after the first injection that the cramps in his limbs were abating and he had no abdominal colic and no bloody stools.

The first specimen of urine was obtained at 10 p.m. in scanty quantity and loaded with protein; the sediment contained casts in most unusual numbers, some hundreds to a field. Next day the patient felt comfortable. His blood pressure was 120/70. The urinary output was still scanty and showed gross proteinuria, and blood urea was 46 mg. per 100 ml. The urinary output increased considerably from the third day, but there was a heavy trace of protein in the urine up to May 11. His blood pressure was stable at 120/70. On May 15 the sediment still contained a few casts. The patient was allowed up, and was discharged home on May 19.

The total dose of dimercaprol given was 1.6 g. over a period of 72 hours.

COMMENT

Although early vomiting may have prevented full absorption of the dose taken, it is likely that the consequences would have been fatal without appropriate treatment. Among a series of 86 cases of mercuric chloride poisoning reported by Longcope and Luetscher (1949), without treatment with dimercaprol, there were 27 deaths; death occurs in most cases of poisoning with 1 g. and more of the compound. Suppression of urine after an early diuresis, and bloody diarrhoea, point to a heavy absorption of the poison.

Following on the original publication by Peters *et al.* (1945) on the value of dimercaprol in the treatment of arsenical poisoning, Waters and Stock (1945) pointed out its possible use in the treatment of poisoning with other heavy metals, including mercury. Further, Gilman *et al.* (1946) investigated experimentally in cats and dogs the protective action of dimercaprol in poisoning with mercury, and reported favourably on it. The first and most important contribution to human therapeutics was by Longcope *et al.* (1946). They treated 23 cases of mercuric chloride poisoning with one death; one patient who recovered had swallowed 20 g. of the poison. Longcope and Luetscher (1949) reported a further 38 cases so treated, with only one other death. The dosage recommended by them is of 300 mg. for the first injection and a further two or three injections of 150 mg. at four-hourly intervals. A very important point is that treatment should be started at the earliest time within two or three hours from taking the poison. The one death reported occurred when treatment was delayed until 13 hours after poisoning.

Dimercaprol is known to produce toxic symptoms itself if given in a dose of 5 mg. and over per kg. body weight. These symptoms comprise nausea, vomiting, headaches, generalized aches and pains, burning sensations in the mouth, nose, and eyes, sweating, restlessness, weakness, and pains in the limbs, jaws, and trunk muscles. The heart rate is often increased, and there may be a rise in both systolic and diastolic blood pressure. These signs and symptoms subside within four hours (Peters *et al.*, 1945). The initial dose of 300 mg. recommended by Longcope may be expected to produce toxic symptoms in a number of patients of rather slender build; these symptoms have not been reported in the treatment of acute arsenical and mercuric poisoning, perhaps because the drug combines very rapidly within the body with heavy metals and is no longer available in free form. In comparison with the extreme danger to life of poisoning with mercuric chloride the risk of toxic reaction from the first large dose of dimercaprol is certainly inconsiderable.

The case described above made a remarkable recovery, as treatment was delayed for 12 hours and the first dose of the antidote was inadequate.

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Reviews

TEXTBOOK OF DERMATOLOGY

Dermatologie. By Professor Robert Degos. (Pp. 1,160; 301 figures. 8,600 francs.) Paris: Editions Médicales Flammarion. 1953.

This is an outstanding book in the great French tradition. It is comprehensive, but throughout bears the stamp of personal observation and experience. Many of the verbal descriptions are masterpieces, and these are supported by black-and-white pictures which are uniformly of the highest class both in photographic technique and in portrayal of their subject. The photomicrographs of histological sections are of equal calibre. Where required there are concise discussions in small print of the more scientific aspects of pathogenesis—for example, the relation of heparin to mast-cells, and the chemical aspects of melanogenesis. More attention is paid to foreign contributions to dermatology than in many French books, but though the author has read widely he has also read critically. Nowhere is the sense of personal experience more marked than in the sections on treatment, where the author's comments help the reader to determine which treatments are of actual rather than theoretical value. One might even wish that the author had had the courage to leave out some of those rather speculative forms of treatment which he obviously feels do not work in practice. He critically assesses such recently introduced agents as A.C.T.H. and the antibiotics, though he does not mention mepacrine in the treatment of lupus erythematosus. The whole book is beautifully produced on excellent paper, and bound in a stout loose-leaf cover so that supplementary pages may be added from time to time.

With such an excellent production it seems almost churlish to criticize, but it is hoped that anything which is said here may be construed as constructive and not destructive. The arrangement in chapters is based purely on the descriptive nature of the lesion—for example, erythematous lesions, papular lesions, scaling lesions, etc.—and the book suffers from defects inherent in such a system. Thus observations on syphilitic lesions are scattered throughout at least eleven different chapters, which entails many cross-references, while accounts of such varied conditions as warts, urticaria, Darier's disease, and filariasis are all found in one chapter. Even this system breaks down, and the author is forced to have such chapters as "Malignant Haematodermia" and "Naevi" which do not conform to one type of clinical lesion. It would surely be easier for the reader and make for clearer thinking if the book were arranged aetiologically, even though some difficulties might result. The other major criticism is that the book does not convey to the reader the importance of psychological factors in many dermatoses. There are references to "chocs émotifs" and "troubles nerveux," but these are only in passing, and no account is given of such fundamental work as that of the Guy's school on the asthma-eczema complex or Klaber and Wittkower on rosacea. In patients with constitutional eczema no mention is made of psychological treatment either by a sympathetic dermatologist or a trained psychologist, nor of phenobarbitone.

Other omissions noted are any reference to thorium X, or to dithranol in the treatment of psoriasis, nor is any mention made of cholinergic urticaria and Grant's work, nor of recent work by O'Brien and Sulzberger and others on prickly heat. The proof reading in French has been excellent, only one slip being noticed (*naïéance* on p. 445), but, though better than most French writings, English names are still spelt wrong, even "Whitefield," and there are several examples of unusual accentuation—e.g., pemphigus érythématosus (p. 445).

But these are trivial points in what is undoubtedly one of the best textbooks of dermatology produced in any language for many years.

F. F. HELLIER.

EXPERIMENTAL HYPNOSIS

Experimental Hypnosis: A Symposium of Articles on Research by many of the World's Leading Authorities. Edited by Leslie M. LeCron. (Pp. 483. \$6 or £2 5s.) New York and London: The Macmillan Company. 1952.

In the numerous recent books on hypnosis, it is presented variously as a method of treatment scorned by orthodox medicine and offering new hope for suffering mankind, as a mystery exclusive to master minds, as a sort of back door to the occult world, or as a branch of medicine meriting a Royal Society of its own. The drama of the hypnotic séance has been apt to get into the writer's style, and he presents himself either as a high priest in triumph or as a misunderstood man who has to appeal to the layman for a fair hearing.

The editor of this book has succeeded in avoiding these difficulties and in marshalling 20 contributors who present, for the most part, objective evidence, much of it original, on aspects of hypnosis which can be subject to experiment. Experiments on different techniques, the state of the nervous system at different levels of hypnosis, its effects on memory and efficiency in mental tests, on the time sense, on the formation and extinction of conditioned responses, and on autonomic and secretory function are all discussed. There is a reasoned appreciation, supported by experiment, of the possibilities of misuse of hypnosis for antisocial ends and an account of the results of its use in dentistry and obstetrics. Particular interest attaches to the editor's own work on age-regression and the results of educational tests given to subjects who have been told they are of school age.

All books on hypnosis have a lay circulation, especially among the morbidly interested, and the authors recognize this. But they discuss the sort of questions which are commonly asked by the intelligent and stable layman and the medical research worker, and give a general view of the present state of experimental work in a readable form. Continuity between the contributors is provided by a foreword to each article by the editor, who has produced a book of great interest to the general medical reader.

ALEXANDER KENNEDY.

TEXTBOOK OF GYNAECOLOGY

Textbook of Gynecology. By Emil Novak, M.D., D.Sc. (Hons.), F.A.C.S., F.R.C.O.G. (Hon.), and Edmund K. Novak, M.D., F.A.C.S. Fourth edition. (Pp. 800; 522 illustrations. £3 8s. 6d.) London: Baillière, Tindall and Cox. 1952.

In writing this fourth edition of his textbook of gynaecology Dr. Emil Novak has enlisted the help of his son, Dr. Edmund K. Novak. If this is a sign of advancing years and preparation for retirement on the part of the senior author, the book itself shows no such signs. It remains distinguished by the charm, enthusiasm, fluency, and well-ordered knowledge of the master. Some may argue that the pattern is more orderly than Nature intended or indeed shows, but the examination candidate will not have any such misgivings and will be thankful to have all scientific doubts and discrepancies disguised or hidden away.

Anyone meeting this book for the first time and without its title page would have no difficulty in recognizing it as written by the author of *Gynecologic and Obstetric Pathology*, which was first published one year earlier. The two books are similar in style and layout, and many of the illustrations are identical. This is considerably larger because, in addition to the systematic accounts of various diseases and their pathology, it includes many chapters on essentially clinical problems such as menstrual disorders, sex and marital relations, discharge, backache, sterility, and endocrine upsets. A chapter on female urology is contributed by Dr. H. S. Everett.

Since the book is designed for undergraduates and general practitioners, all details of surgical treatment are deliberately and properly omitted. Many undergraduates will probably consider that for their purposes the other aspects could well have been abbreviated. But more

advanced readers will find the book extremely attractive, and, except for those interested only in pathology, it is rather better value than its elder sister, for it contains nearly as much pathology and much more besides.

T. N. A. JEFFCOATE.

HISTORY OF NEUROLOGICAL SURGERY

The History and Development of Neurological Surgery. By Ernest Sachs, M.D. (Pp. 158; 50 figures. £1 10s.) London: Cassell and Co. 1953.

This is a very brief account of the development of neurological surgery from the earliest times to the present day. The first half of the book is on the interesting but relatively unimportant surgical measures undertaken from the earliest times to the advent of the Listerian era; into the second half are crowded all the remarkable advances made during the past hundred years. The reader will probably wish that the author had expanded the latter half to twice or three times its present size. Nevertheless, by the inclusion of 540 references, the way is left clear for anyone to follow up any particular subject in which he is specially interested.

Due credit is given to the outstanding pioneer work of Victor Horsley and Harvey Cushing, but we thought it inaccurate to attribute to the latter the devising of the trans-frontal method of approach to the pituitary fossa. Frazier, by modifying MacArthur's technique, first popularized the trans-frontal approach, though no doubt Cushing modified the details of the method.

It is well said that during the war of 1939-45 neurological surgeons for the first time came into their own, and that in that war results of treatment of head injuries were far better than ever before. If the author had compared mortality from penetrating head wounds in the first and second world wars the figures would have been most impressive, for it is known that the mortality was reduced from 50% to less than 10%. Half a page is given to a description of the improvement in the treatment of spinal injuries, but there is no mention of the remarkable work of Ludwig Guttmann, whose ingenious and active methods of rehabilitation have revolutionized the outlook for many of those who were formerly left to linger on in misery until death relieved them.

The book is illustrated by fifty attractive illustrations. On p. 36 occurs the word "escerotics" where the sense demands "escharotics," and the curious word is repeated in the index. We thought this might be an American form of the more common term, but could not find it in an American dictionary and must presume it is a misprint.

ZACHARY COPE.

BONE TRANSPLANTING

Die Konservierung von Knochengewebe für Transplantation. By Hans Roth. (Pp. 222; 233 figures. £4 3s.) Vienna: Springer. 1952.

An active field of research is at present provided by studies on the behaviour of tissues and organs transplanted from their normal site, or from one individual to another. Interest in the subject is stimulated by hopes of widening the scope of the surgical use of grafted tissues in the replacement of anatomical or physiological defects in the body. Blood transfusion is a frequently employed transplantation, while such tissues as skin, corneal tissue, bone, cartilage, blood vessels, and endocrine glands are being used or studied, and the possibility of grafting intact organs, such as the kidney, is under active investigation.

The author of the present volume, a surgeon of the university clinic at Basle, discusses in some detail the preservation of bone tissue for transplantation. This is prefaced by a good general account of the behaviour of bone transplants as seen in experimental studies. The author summarizes most of the important work in this field, and in addition describes experimental studies of his own. He also recounts his extensive experience with clinical bone grafts and with the organization of a "bone bank" for the preservation of the necessary grafting material.

Innate chemical and immunological differences appear usually to prevent more than the transient survival of cells when transplanted from one individual to another, and it is of interest that the regular and effective use of bone as a grafting material depends on factors other than cell survival on the part of the transplant. Indeed, bone now has to compete with a range of non-biological synthetic substances as a grafting material, and its advantages depend chiefly on its influence as a stimulus to the development of new bone by the tissue in contact with the graft. Grafted into the skeleton, the ultimate fate of a satisfactory transplant is complete replacement by newly developed living tissue which becomes functionally incorporated into the structure of the bone.

The healing process is much the same whether the transplanted bone comes from the individual into which it is grafted, from another individual of the same species, or even from a different species. Available information suggests, however, that the rate of repair is more rapid when the graft is an "autotransplant," but the convenience of using "preserved" bone from another individual is such that this type of graft (that is, a "homotransplant") finds frequent clinical use.

After his account of general studies with experimental transplants the author outlines the technique he has developed for the operation of a "bone bank" and for the clinical use of the material from it. He uses corpse bone, removed with aseptic precautions and preserved by refrigeration in liquid paraffin at a temperature of about -15°C . Dr. Roth has used such material on more than 100 occasions in a wide variety of orthopaedic operations.

This book is accurately written and excellently produced, with an index and a good bibliography. It is certain to be of considerable interest and use to those concerned with any aspect—clinical or experimental—of bone transplantation.

H. A. SISSONS.

TREATMENT OF BURNS

On Burns. Compiled and edited by Nathan A. Womack, M.D. (Pp. 178. £2.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This book is the story recorded on tape and "gently edited" of a 14-day conference held in the State University of Iowa in 1951. As an authoritative work on the treatment of burns it is disappointing, though as a detailed record of a good conference between surgeons and research workers it is admirable.

The only clinical material carefully analysed is a study of 200 severely burned patients treated in one hospital from 1930 to 1950. This was a period of great change in methods of treating these injuries, and relatively few of the 200 had been treated by accepted modern methods. One contributor, Dr. Truman Blocker, is an obvious enthusiast for exposure treatment of acute burns, but the argument and evidence he presents for this method are not altogether convincing. His chapter might well have been matched by an equal enthusiast for a carefully undertaken occlusive method of treatment, but the book contains no authoritative evidence on this matter, nor does it indicate that both methods have their place in local treatment. The conference discussed most of the important problems associated with the treatment of thermal injury in peacetime, and it will be of interest to all who are concerned in this.

The symposium was an outgrowth of a discussion of a State Advisory Committee for Civil Defence, concerned with stock-piling material for the medical care of thermal injuries in any future war with modern weapons. It sought only to get a clearer understanding of accepted hospital methods of handling thermal injuries. The main value of the book to readers in Britain is that it is an excellent example of a realistic approach to a civil-defence problem by the State of Iowa, an example that could well be followed by the regions and their hospital authorities here.

W. GISSANE.

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MENTAL ILLNESS IN TWINS

Mental illness has to-day yielded relatively few of the secrets of its more common forms, and, though the theory of demoniacal possession and the wages of sin may have given place to dianetics and the importance of guilt-feelings, the proportion of theory to observation is often still very high. The only antidote to this is sound observation, and for those who can tolerate the pains of scientific doubt the unsolved problem of the major psychoses has acted as a stimulus to the gathering of reliable information, to consideration of predisposing and exciting causes, and to planned observation of the natural history of the morbid process. In this respect the progress of research into schizophrenia and cancer—to take two common diseases—is remarkably similar; there are advances in empirical treatment and accumulation of much information, but the main problem awaits solution. In both the constitutional approach has led indirectly to advances in the science of genetics, because it was a necessary preliminary to establish the extent to which inherited factors could predispose to disease and the extent to which a morbid predisposition could be modified by factors occurring during life and by the effects of treatment. In the same way, also, it has been necessary to investigate genetic factors in normal tissue growth and, in the study of the mental disorder, the inherited factors in the growth of normal personality, of which that of the schizophrenic is a caricature.

It is seventy years ago since Francis Galton¹ gathered information about the intellect, temperament, and character of twins and showed that identical twins were more alike in these respects than binovular ones or siblings of different age. In 1926 Dahlberg²

reported his findings in a large number of normal twins and discussed the applicability of twin studies to the problem of hereditary and environmental influences. Since then a series of workers have successively brought new principles to light and developed new techniques in this specialized field of study.

If a pair of uniovular twins are separated at birth and brought up in different environments, and if both develop schizophrenia at the age of 17, one after an unhappy love affair and the other after working hard for an examination, it appears at first sight that a few more of such examples would make the evidence for a wholly genetic aetiology for the disease overwhelming. The matter is, however, not as simple as that, and it was Luxenburger³ who pointed out how deceptive might be the conclusions drawn from the isolated reported case. While recognizing that such cases, selected because of exceptional interest, are of great value in indicating possibilities, he showed that they are of relatively small importance in estimating the general significance of inherited factors. For this reason he embarked on a study of unselected twins by collecting from hospitals over a large area of Germany the names of all the patients with schizophrenia who happened to be twins. Taking uniovular and binovular twins together, Luxenburger found that for every pair of twins in which schizophrenia appeared in both there were four pairs in which only one twin was affected—in other words, there was a concordance rate of 20% as against 80% in cases collected from the literature. But only uniovular twins can be regarded as genetically identical, and the later studies of Lange,⁴ Smith,⁵ and Rosanoff⁶ on criminal, mentally defective, schizophrenic, and manic-depressive twins suffered from the defect that there was no satisfactory criterion of ovularity. Rosanoff made the important suggestion that separate gene-borne predisposing and activating factors might account for the irregular familial distribution, especially in manic-depressive states. In the later work of Conrad⁷ and Stumpff⁸ the ovularity was more carefully investigated. In 1939 Juda⁹ reported on a study of mental defectives and showed that conditions hitherto thought to be due to birth trauma occurred in both twins when one had been delivered without difficulty. In general the concordance for states of mental deficiency accompanied by physical stigmata was very close. A further advance was made in 1941 by Essen-Møller¹⁰ in Sweden, who observed in a series of unselected twins that in schizophrenia especially there might be concordance in the fact of breakdown, but that the clinical picture sometimes differed very greatly in the pairs studied. In other observations, especially those of Kallmann,¹¹ the

high concordance in both schizophrenia and manic-depressive psychosis was confirmed, and from his material it became clear that in spite of the great aetiological importance of heredity recovery may occur, and this may be related to treatment.

In 1936 Dr. Eliot Slater set out to plan a survey of unselected twins appearing in the London mental hospitals and psychiatric units, a study which would be free from the objections to previous inquiries and in which, for the first time, the relationship of normal personality to psychotic symptoms would be considered. He also included psychoneurotic disorders and psychopathic personalities in the scope of his inquiries. The results, now published as a monograph¹² by the Medical Research Council, represent the conclusion of an enormous task carried out with a constant appreciation of the dangers of loose thinking and of the need to compile records which would be of use to later workers in the same field. It is not too much to say that Dr. Slater, in working out his methods and presenting his results, has made contributions to this branch of study which are applicable throughout all medical research. Altogether there were 295 patients, born from multiple births, about whose twins the necessary information was collected, and a full clinical study was made of each pair. The greatest care was taken to establish ovularity, and an original method of converting finger-print characteristics into terms of figures was worked out and proved to be a reliable index of similarity. Attention was paid to personality traits as well as to the symptoms of psychiatric disorder, and the case histories were condensed into summaries without great loss of content. The results are clearly given, and the protocols are such that further results of interest will be obtainable in the future as specific problems are thrown up by later work.

Fortunately the results of Slater's consistent and dispassionate approach emphasize the great importance of environmental factors on individuals rendered vulnerable to disease by their heredity and show that they can be helped to adjust themselves to life in spite of the inborn handicap. This evidence should make those concerned with treatment less hesitant to face the facts of genetics, and less inclined to therapeutic pessimism when the constitutional element is clearly great.

Slater has also shown that, with certain limitations, research on twins, especially when combined with clinical studies, is a valid approach to the problem of heredity and environment in mental disease. So far as specific diseases are concerned, the concordance for schizophrenia in uniovular twins was 76% compared to Kallmann's 86%. From this it is deduced that

heredity plays a major part in predisposition to this disease, but the case studies indicate that the personality of the individual and the experience of his lifetime have much to do with whether the disease becomes manifest or not. Among the psychopathic and psychoneurotic twins the concordance rate was lower, but the actual form of the disorder was more often similar—and this appears to be related to the strong evidence in this study that the basic make-up of the personality is largely determined by heredity. It will take some time to digest and apply the results of this survey, but there is little doubt that the Medical Research Council, in sponsoring this work, has assisted Dr. Slater to present a report which will doubtless rank as a classic in methodology and in the objective presentation of clinical material. It will, in addition, notably increase the ratio of observation to theory in the very speculative field of the aetiology of mental disorder.

FIRST WORLD CONFERENCE ON MEDICAL EDUCATION

Modern history may justify scepticism about the usefulness of large international gatherings, but those who had the duty of thanking the organizers of the First World Conference on Medical Education—held in London last week under the auspices of the World Medical Association—spoke with a sincerity which was clearly in tune with the feelings of the delegates. The 600 representatives who came to the Conference from 59 countries and 92 medical schools or universities seemed confident that medical teachers at least could disregard the barriers of distance and language and meet as one group of people with a common purpose—the improvement of the practice of medicine.

The results of a conference of this size cannot be quickly assessed and packed tidily away into compartments labelled "premedical studies," "pre-clinical studies," "clinical studies," and so on. In general the delegates had no difficulty in agreeing that changes were needed in medical education, but, as Dr. Victor Johnson remarked, it is easier to move a graveyard than change the curriculum. The course of medical study is like a slab of butter: it can be pressed into various shapes, and pieces lopped off at one end can be slapped on at the other, but the volume remains the same. The Conference heard many suggestions about the shape the curriculum should take and about the places where a reduction appeared possible and, more commonly, where additions were essential. No one had the temerity to

¹ *Inquiries into Human Faculty*. London, 1883.
² *Twin Births and Twins from a Hereditary Point of View*. Stockholm, 1926.
³ *Z. ges. Neurol. Psychiat.*, 1928, 116, 297.
⁴ *Verbrechen als Schicksal, Studien an kriminellen Zwillingen*. Leipzig, 1929.
⁵ *Z. ges. Neurol. Psychiat.*, 1930, 125, 678.
⁶ *Amer. J. Psychiat.*, 1934, 91, 247.
⁷ *Z. ges. Neurol. Psychiat.*, 1935, 153, 271.
⁸ *Die Ursprünge des Verbrechens dargestellt am Lebenslauf von Zwillingen*. Leipzig, 1936.
⁹ *Z. ges. Neurol. Psychiat.*, 1939, 166, 365.
¹⁰ *Acta psychiat. (Kbh.)*, Suppl. 23, 1941.
¹¹ *Congrès International de Psychiatrie, Rapport VI Psychiatrie Sociale* (pp. 1-27). Paris, 1950.
¹² Slater, E., *Psychotic and Neurotic Illnesses in Twins*, Spec. Rep. Ser. med. Res. Coun. (Lond.), No. 278, 1953. H.M.S.O., London.

say that a perfect curriculum could be devised for any one country, let alone the world, but all were agreed that efforts to improve medical education should be unceasing—which seems to indicate that the first world conference on this subject will not by any means be the last.

In last week's *Journal* we commented on the purpose of the Conference and published Sir Lionel Whitby's presidential address and other papers read at the opening plenary session. Elsewhere in this issue we continue our report of the proceedings of the Conference (pp. 556 to 565)—a report that has necessarily to be curtailed, for over 200 speakers contributed to the discussions during the week. The final assessment of the work of the Conference will have to await the publication of its *Proceedings*, but there can be no doubt that it fulfilled the hopes of those who originated the idea. At the concluding plenary session the vice-presidents and rapporteurs of each of the four sections gave most thoughtful and informative reviews of the week's work, and their addresses will be reported in full in next week's *Journal*.

In the section which discussed "Requirements for Entry into Medical Schools," the case for educating prospective medical students in the humanities was of course put strongly, but, as Dr. Raymond Whitehead, the rapporteur of the section, pointed out in his remarks, the section felt it was worth emphasizing that education in science had its own cultural value—a view which those with no scientific training often conveniently ignore.

In this section the topic which provoked the most lively discussion was that on the selection of students. Plato thought that the ideal State should have a ruling caste nurtured and trained for government. The ideal medical student could be produced only by the same Utopian methods. Teachers are perhaps in danger of expecting too much from their students, and, as Dr. Whitehead said, they should be content to see only one or two divine attributes in them, remembering that "they are merely ourselves when young." The main purpose of selection is to pick out those who will educate themselves. The view that self-education was all important in the making of a doctor—both before and after graduation—was repeated time and again throughout the conference. A medical student from the Netherlands even went so far as to say that examination failures were often due to the fact that students were too hampered by their teachers and not allowed to find their own way about.

In his comments on the work of the second section—"Aims and Content of the Medical Curriculum"—the vice-president, Sir A. L. Mudaliar, wisely

reminded his audience that the content of the curriculum matters less than those who teach it. There was no lack of constructive suggestions about how the teaching of some subjects—anatomy and physiology, for instance—could be combined and about how the whole curriculum could be integrated. Dr. Morgan Jones, the rapporteur of this section, called attention to the general feeling that the fragmentation of the curriculum must not be allowed to go any further and that the study of medicine must be made a comprehensible whole once again. There are many ways of teaching the basic sciences and of relating this teaching with clinical problems, but, as Dr. Morgan Jones summed it up, "for the study of the practice of medicine in its broader aspects, there is no substitute for clinical clerkships, out-patient clinical work, and the study of the patient in his home and occupational environment."

Medical educators, like all other teachers, must remain constantly aware that the road they are travelling can very quickly become rutted. Professor A. Hurtado, the vice-president of the section considering "Techniques and Methods of Medical Education" urged the importance of experimentation in teaching as in all medical subjects. Many interesting schemes which are being tried out in various parts of the world were described during the meeting of this section, and there was a lively discussion about the place of teaching in the patient's home. This reflected the general awareness of the danger that the student may come to regard a patient in a hospital bed as a case—interesting or commonplace—but there was agreement that teaching in the home should not be designed as a preparation for general practice any more than teaching in the hospital should be designed as a preparation for a specialist career. The aim of all teaching should be to turn out what one speaker described as "the basic doctor," who on qualification would be prepared to launch out into the study and, later, practice of that branch of medicine for which his inclination and talents fitted him. As Professor Hurtado said, it would be entirely erroneous to try to fit pregraduate education into some predetermined plan of postgraduate activity. This section agreed on the value of the clinico-pathological conference as a tool of medical education and heard several experts talk on the management of group discussions. In presenting his report as rapporteur of the section Professor Ian Aird said that at times it was essential for the teacher to descend from his lofty isolation and let his students argue and discuss, "merely correcting their errors and guiding the direction of their common flow of thought." Several speakers emphasized the necessity for close personal association

between teacher and student, but not much was said in debate about the tutorial system which Sir Lionel Whitby recommended in his presidential address. This entails the selection from among the teaching staff of "tutors" to guide the steps and supervise the work of a group of students. No doubt future conferences will return to this theme.

The fact that preventive and social medicine was allotted a section of its own at this conference may have occasioned some surprise, but, as Professor Stampar said, it also gave much satisfaction to those who have long believed in the importance of social medicine, not only as a subject in the medical curriculum, but also as a background to hospital and family practice. As a matter of fact speakers in every section seemed anxious to comment on the new slant which medicine was taking as the result of a more perceptive understanding of the relationship between health and social welfare. That social medicine still does not receive enough attention was a common complaint, but even those who agreed with this complaint were not too sure of the exact place of social medicine in undergraduate education. The influence of socio-medical studies is of course now pervading the whole curriculum, and this influence is bound to become stronger. Why, then, are some clinicians still hostile to this subject? Dr. Charles Fletcher, the rapporteur of this section, gave one possible answer to this question:

"Experts in social medicine do not find it easy to expound their subject, which, though precise and objective in many aspects, also contains many conceptions that are still imprecise. Its advocates are thus tempted to talk in indigestible phrases, whose meaning, I suspect, is often as doubtful to them as to the rest of us. Such terms must be repressed if medical men are to listen, and social medicine must base its claims on a clear exposition of effective and comprehensible achievement."

It is only fair to add that contributors to the discussions of this section clearly showed that they possessed the powers of exposition which social medicine particularly demands.

When the Conference came to an end last Saturday no one doubted its success. Disagreements in debate were numerous, but there was no acrimony. The many social occasions, graced by the presence of the delegates' wives and families, were true demonstrations of international amity. Above all, there was an optimistic conviction that medical teachers, united by their strong professional bonds, common purpose, and humanistic tradition, could, and would, exert a strong influence for the good in world affairs.

DEFICIENCY OF POTASSIUM

The amount of potassium in the body, as measured by the technique of isotope dilution, is about 40 mEq. per kg., or some 2,800 mEq. in all.¹ The amount in the extracellular fluid, 4 mEq. per litre, is very small, and 97% of the potassium in the body is in the intracellular fluid. Potassium is normally lost through the skin, the bowel, and the kidney. The kidney can adjust to a very low intake,^{2,3} though it may take a few days to do so, but a loss from the skin and the bowel, of the order of 10 mEq. daily, continues.⁴ During starvation the potassium liberated by the breakdown of body tissues may be enough to cover the inevitable losses and to maintain a normal concentration in the body fluids,⁵ though the total amount in the body is obviously reduced. On the other hand, moderate deficiencies of potassium may arise with artificial diets that exclude potassium but provide adequate calories and protein.^{2,3,4} Mr. I. W. MacPhee discusses in this issue (p. 528) the mechanisms involved in the production of potassium deficiency. Large deficits, amounting to 30% of the total,^{6,7} may occur when the losses from the body are abnormally large. This happens, for instance, when fluid is lost from the gastro-intestinal tract by vomiting, aspiration, or diarrhoea, or through a fistula; and also when the normal renal mechanism for conserving potassium is upset by acidosis⁸ or alkalosis.⁹ Some forms of renal disease themselves lead to large losses of potassium.¹⁰ Moreover, perhaps because of an increase in the excretion of adrenocortical hormone, the renal conservation of potassium is not so efficient in ill persons as in the normal.

A deficiency of potassium may thus complicate many diseases, but symptoms attributable to it have been capricious in their incidence and have been relieved, at least temporarily, by doses of potassium that were small compared with the total deficit. For example, a deficit of 800 mEq. is equivalent to 60 g. of potassium chloride, but severe symptoms, if present at all, may disappear after the first dose of 10 g. The clinical effects depend partly on other changes in electrolyte metabolism as well as on the extent of the deficit of potassium. Potassium shortage is compensated by a retention of sodium in place of potassium

¹ Corsa, L., Jun., Olney, J. M., Jun., Steenburg, R. W., Ball, M. R., and Moore, F. D., *J. clin. Invest.*, 1950, **29**, 1280.
² Black, D. A. K., and Milne, M. D., *Clin. Sci.*, 1952, **11**, 397.
³ Lowe, K. G., *ibid.*, 1953, **12**, 57.
⁴ Blahd, W. H., and Bassett, S. H., *Metabolism*, 1953, **2**, 218.
⁵ Aikawa, J. K., *Proc. Soc. exp. Biol. (N.Y.)*, 1951, **78**, 524.
⁶ Fourman, P., and Ainley Walker, K. M. S., *Lancet*, 1952, **2**, 368.
⁷ Schwartz, W. B., and Reiman, A. S., *J. clin. Invest.*, 1953, **32**, 258.
⁸ Fourman, P., *Lancet*, 1952, **1**, 1042.
⁹ Franglen, G. T., McGarry, E., and Spencer, A. G., *J. Physiol. (Lond.)*, 1953, **101**, 35.
¹⁰ Milne, M. D., Stanbury, S. W., and Thomson, A. E., *Quart. J. Med.*, 1952, **21**, 61.
¹¹ Cannon, P. R., Frazier, L. E., and Hughes, R. H., *Metabolism*, 1953, **2**, 297.
¹² LeQuesne, L. P., and Lewis, A. A. G., *Lancet*, 1953, **1**, 153.
¹³ *New Engl. J. Med.*, 1952, **246**, 637.

in the cells and is associated with an alkalosis in the extracellular fluid,² shown by a high bicarbonate and a low chloride concentration in the plasma. Under these conditions symptoms may be slight, but if sodium is not retained and if there is a complicating acidosis symptoms may become obvious once the deficit of potassium exceeds some 10–15% of the total body potassium.⁶ Mental apathy and stupor, anorexia, nausea, and symptoms of intestinal atony are among the more prominent. With very gross deficiencies such symptoms may occur even without a complicating acidosis, and Dr. J. S. Logan gives an instance elsewhere in this issue (p. 532). He suggests that a gastric ileus in his patient, who had had a gastro-enterostomy, may have been attributable to the deficiency of potassium.

The large amounts of potassium required to correct a deficiency cannot be given quickly because a sudden rise in the concentration of potassium in the extracellular fluid may stop the heart. Fortunately the urgent manifestations of a potassium shortage can be reversed with relatively small amounts of potassium, provided the compensatory mechanisms for a potassium deficiency can operate. Therefore if sodium deficiency and acidosis complicate the picture they must be corrected. A low plasma bicarbonate content points to the need for saline. Although urgent symptoms may abate with minimal treatment, it is still desirable to correct the potassium deficiency completely, for, even when compensated by sodium retention, it may cause myocardial lesions¹¹; it may be responsible for apathy, anorexia, constipation, and intestinal atony in convalescent patients; and it may predispose to oedema.^{6, 12}

Normal diets provide 50–100 mEq. of potassium daily and will gradually restore a deficit. With smaller intakes or with continuing losses supplements of potassium may be needed, but, when possible, intravenous administration must be avoided. But when intravenous therapy is essential the amounts of potassium provided by Ringer's solution and the like are quite inadequate for the treatment or prevention of a deficiency. The usual practice is to give a solution containing 2.7–3.1 g. (70–80 mEq.) in a litre slowly over four hours. Logan points out that intravenous therapy may be avoided by giving potassium per rectum.

The ideal course of action is to prevent major deficiencies from arising in patients who are in danger. At present the diagnosis of potassium deficiency rests above all on the history of abnormal losses. The losses can, however, be replaced as they occur, and for this Cooke and Crawley¹³ have devised two simple solutions for patients who are losing gastric or intes-

tinal secretions. The appropriate solution is given intravenously in a volume equivalent to that lost. Surgeons may welcome this means of avoiding a difficult biochemical problem when patients are unable to take potassium salts by mouth.

A NEW ADRENAL COMPOUND

The various types of biological activity which reside in the suprarenal glands can be tracked down to their origins in certain chemical fractions, and from these concentrates 29 separate crystalline steroid substances have been isolated. The chemical constitution of all but one of these substances has been determined, and during the last year or so nearly all of them have been synthesized. Of these 29 compounds, about 7 have shown themselves able to prolong life in adrenalectomized animals and to prevent the occurrence of at least one of the major side-effects of adrenalectomy. When subjected to different methods of assay these seven key compounds have shown considerable differences in their main modes of action, which are, however, often roughly divided under the headings of "mineraloid" and "gluco-corticoid" activity. The most potent of the gluco-corticoids is hydrocortisone (17-hydroxycorticosterone), and until now deoxycortone (D.C.A.) has proved itself the most active of the mineralo-corticoids. Corticosterone takes a half-way position between these two substances. So far, the two most potent of the gluco-corticoids, hydrocortisone and cortisone, have been recognized as being the substances whose effect on the pathological processes of rheumatoid arthritis and certain other rheumatic diseases is greatest. Nevertheless, it is recognized by clinicians that even for this purpose it is probable that more effective substances, or combinations of substances, may emerge as the physiology of the adrenal gland and its secretions become better understood.

Examination of blood from the suprarenal vein has shown that corticosterone and hydrocortisone are released from the gland in amounts which make it very probable that it is these two compounds which are responsible for the normal adrenal carbohydrate metabolism. On the other hand, similar observations have not supported the original idea that mineralo-corticoid activity is principally regulated by deoxycortone. It now seems that the steroid fraction which is mainly responsible for the mineraloid activity of the normal gland is a new compound, to which the name "electrocortin" has been provisionally attached by Simpson and Tait of the Middlesex Hospital Medical School. Since, however, this compound is contained within the "amorphous fraction" of the glandular secretion, it has previously been impossible to investigate the effect of this fraction on the human or animal body.

On August 25 Professor T. Reichstein, who in 1951 shared the Nobel Prize for Medicine with Drs. P. S. Hench and E. C. Kendall, announced at the Eighth International Congress of Rheumatic Diseases held in Geneva that he has been able at last to produce this

substance in pure crystalline form. The process of crystallization is at present long and complicated, and no doubt it will be some time before therapeutic trials of electrocortin can be started. The outlook, however, is promising, since it would appear that from now on the three main hormones of the normal adrenal cortex will be available in pure form, and clinicians will be able to administer them in controlled fashion, varying the relative dosage in accordance with the needs of the body. They may thus shortly be able to reproduce the normal functioning of the adrenal cortex in those diseases, including the rheumatic group, in which this form of therapy can be shown to be of major therapeutic importance.

SELECTION OF STUDENTS BY INTELLIGENCE TESTS

Sir Frederic Bartlett, who last week addressed one of the sections of the First World Conference on Medical Education on the use and value of intelligence and aptitude tests, threw aside his distributed paper, which was concerned with general and fundamental considerations, and made the first public statement on the results of a long-term investigation which the Medical Research Council set on foot a little more than five years ago on all aspects of the selection of medical students in Great Britain. A small research group was organized under Dr. A. D. Harris, with its headquarters in the experimental psychology laboratory in Cambridge. The initial plan contemplated a five years' study. The design was to apply representative tests of intelligence to a reasonably large population of prospective medical students before any of them had taken their first medical examination, then to follow these students through all their pre-clinical and clinical medical examinations to their first years in professional practice. The tests used were all of familiar type, fully meeting the usual conventional requirements, and of proved reliability. Complete results were now available, said Sir Frederic Bartlett, for a comparison of test performances with examination records in the first and second M.B. examinations. The conclusion was that the predictive capacity of tests of this kind for the first two medical examinations as conducted in this country was, with one possible exception, entirely negligible. They could, as the situation stood at present, add nothing of importance to existing methods of selection based upon school records and interview. To rely upon them alone or principally would be "fantastically silly." The association between test and examination success was even lower for the second than for the first M.B. There might be a number of reasons for this, but it was difficult to avoid the conclusion that test results might become of smaller and smaller significance the longer the time that had elapsed since they were achieved.

There was, Sir Frederic Bartlett added, one possible exception to this generally unpromising story. There were always a few candidates—less than 5% in this country—who for a variety of reasons slip through the meshes of the net of school record and interview and

proceed to a career of almost unrelieved failure. The figures obtained in this investigation showed a critical point of intelligence-test score below which a candidate was exceedingly unlikely to pass the first examination, and in no such case, out of some 600 candidates already followed up, had the second medical examination been passed. Whether for this small minority—already indicated by other means, but not quite decisively—it was worth bringing in some existing procedure of testing was a practical question which must be decided by the relevant controlling medical authority in each country. Sir Frederic Bartlett's opinion was that it was worth while. Neither the organization nor the cost involved would amount to much, and a good deal of frustration and discontent on both sides might be avoided. The story was still incomplete. The results of the "finals" had still to come along, and it was possible that the tests would prove of greater predictive value at that stage, though Sir Frederic Bartlett thought this unlikely for two main reasons. In the first place, there was evidence that test performances became less indicative of contemporary capacity with lapse of time, and, secondly, in this country at any rate, the distribution of successes in medical finals was so widely different from that in any known intelligence test that considerable agreement between the two was nearly impossible.

AUSTRALIA'S HEALTH SERVICE

Health matters were a major issue in the 1949 Australian election, which brought the Liberal and Country Party Government into power. The Health Act of the preceding Labour Government had been strongly opposed by the medical profession and received its death blow from a decision of the Australian High Court, which ruled that part of it was unconstitutional. The present Government in four years has introduced various health measures under regulations. It now proposes to consolidate these in a Bill to be introduced in the coming session of the Federal Parliament. The Minister of Health of Australia, Sir Earle Page, has described the proposed health service to the General Assembly of the World Medical Association at The Hague this week. His address is summarized in the opening pages of the *Supplement*.

Apart from public health, and measures for the medical care of the poor which any society would accept as a charge on the community, Australia has taken the bold step of pinning its faith to the voluntary principle. The Australians are a vigorous people and might be expected not slavishly to copy the health schemes of other countries. They believe that the voluntary method is the right one for them and that it brings out the best qualities of their people. Their scheme has been based on sound foundations: the agreement and co-operation of the medical profession were secured before it was introduced; and it was introduced in stages and not placed in final form on the Statute Book until considerable experience had been obtained. The progress of the scheme will be watched with interest all over the world.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE ANXIETY STATE

BY

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An anxiety state is nature's way of announcing that life—the common life of mind and body—is disturbed and uneasy. Patient and doctor alike might welcome more precise, more self-evident indications of conflict and discord. The patient may have nothing to show for his illness—how willingly would he change it for a broken leg—and the doctor, having tried everything, may grow impatient. Nevertheless, we have in the anxiety state an authentic illness which creates a vast amount of unhappiness and incompetence.

The medical student seldom receives sufficient instruction about the psychoneurotic patient, and those seen in hospital are often atypical, with inadequate personalities. The physician brushes them aside impatiently or jokes about them. The phrase "Only nerves" suggests that "nerves" is a well-known and at the same time a discreditable complaint, best disregarded, and this is supported by the tags "A flight into illness," "Escapism," etc., which pass from one textbook to another. The student—immature and unaware of the complexities of emotional experience—with no further guidance from his teachers is unable to overcome acquired prejudice. It may be years before he outgrows his cynicism and appreciates the plain fact that reasonable, respected, and successful people are liable to neurosis. Thus he is apt to suspect an obscure physical complaint when he is consulted by a successful business man who complains of giddiness or palpitations. The young doctor learns late that intellectual brilliance and great organizing ability do not give protection against morbid anxiety. Unaware of this, he leads his patient into paths of expensive investigation, useless treatment, and probably into invalidism.

The Attitude of the Doctor

The purpose of this article is to describe the features of the anxiety state and to suggest how it may be handled by the doctor who has no special training in psychiatry, and in particular the lines along which the interview can be conducted.

Each doctor inevitably displays his own attitude of mind towards neurosis and so towards the anxiety state which is the commonest form of neurosis. But the attitude adopted is significant, since it affects the capacity to recognize the complaint. Recognition has two aspects: the knowledge of the characteristics of the condition; and, secondly, an acceptance of the fact that the anxiety state is in itself an illness and entitled to care and attention.

The sick mind, like the sick body, should be helped by considered rather than by casual methods. The doctor in general practice has not the time (and few have the experience) to use formal psychotherapy, but he can acquaint himself with the general conclusions reached by others about the neuroses. Patients should not be referred to a psychiatric clinic or to see a specialist at the first sign of trouble. The majority need never be, provided the practitioner knows how to interview patients with symptoms of neurosis. Technique is of less importance here than in any other branch of medicine. Personal consideration and a friendly approach can make the examination of therapeutic value, for in the relation between patient and doctor lie the essentials of cure or improvement.

Those people who are by nature mentally dull and therefore unable to compete on equal terms in the world are liable to contract the anxiety state. They are much benefited by our support and encouragement and by the simple prescriptions we may provide. Most sufferers with anxiety states, however, are of good intelligence, and they can be given considerable help by the family doctor who recognizes that, though sick, they are reasonable. The understanding of their puzzling illness may well be a first step towards helping them to resume responsibility for their lives. The doctor who stubbornly relies on mere common sense comprehends the anxiety state with difficulty. An unknown factor is ever present in the clinical picture—namely, the unconscious motives and the hidden mental conflict. The patient may be told of this so that he will cease to blame his environment or the shortcomings of his family. Every branch of medicine has its unknown aspects, but medical aid is not therefore withheld.

Features of the Anxiety State

Emotion plays the leading part in every anxiety state and emotion inevitably has its physical counterparts. Accordingly we always get a combination of psychological and somatic elements, although the prominence of one symptom—such as persistent pain—may distort the picture.

The somatic features, usually mentioned first, resemble closely the physical accompaniments of fear: palpitations, flushing, sweating, increased blood pressure and pulse rate, pain, giddiness, tremors, diarrhoea, polyuria. When the anxiety is protracted, headaches, nausea, and other digestive troubles, vaginismus, impotence, and lassitude may be prominent. Blundering jerky movements and restless foot movements may indicate muscular tension due to morbid anxiety. Usually one or two of these symptoms will be to the fore and fluctuations are common. The psychological symptoms include lack of concentration, unreliability of memory, apprehension, and feelings of unreality or of unreality in the external world and, as a consequence, a dread of insanity.

The anxiety may be centred on specific situations. This may become evident when we ask about travelling; whether the patient dislikes going to theatres or crossing the street; whether he has any particular fears, such as a fear of knives, of blood, of poison or diseases—for example, syphilis, cancer. Such morbid fears are usually called phobias. They are often given special labels such as *claustrophobia* and *agoraphobia*, implying wrongly that they have an origin different from other forms of morbid anxiety. The purpose of the phobia is protective, and the situation or eventuality on which it is focused is shunned. If the patient cannot side-step the dreaded situation he is thrown into a panic.

The patient is often in dread of a situation where he is called on to make a direct response. For instance, should he have to drink a cup of tea his hand shakes—a distressing symptom. Again, he is unduly alarmed at being shut in a lift or a railway carriage from which there is no immediate escape. The dread of going out alone, travelling alone, and many similar situations illustrates the subtlety with which an unconscious, unknown problem is projected upon the environment.

The anxiety-ridden patient feels that many of his symptoms are unreasonable and out of proportion to the circumstances. He agrees with his doctor who reassuringly tells him that there is nothing to worry about. But his symptoms are not the result of forethought and are impervious to

logic. Such symptoms, however—palpitations, pain, etc.—alarm the patient, and his demand for medicine seems to him eminently sensible.

Morbid anxiety has a retarding effect on thought and action, and this helps us to distinguish it from normal anxiety—that is, anxiety which spurs us to fitting effort and achievement, as when the student, anxious about his examinations, works harder. Yet morbid anxiety is reasonable, although the reason is hidden, unconscious.

The Interview

The busy practitioner shudders when a patient says, "I'd better start at the beginning, Doctor." He foresees an egotistical and wandering monologue, and so cuts the interview short. The embarrassment and futility of such interviews can be overcome if we make it a rule to examine the minds as well as the bodies of those patients whose symptoms suggest "nerves." A sympathetic relationship, which is at the same time one of detachment, must be established. Without it there can be no appreciation of the patient as a person. The quality and the value of the interview depend on the personality of the doctor, his sincerity, and his capacity for understanding. Having ascertained the reason for the visit and the immediate circumstances—age, marriage, business, general health—a brief chronological survey of the patient's development, noting the personal and family history, school career, and employment record, should be obtained. In a few minutes it is possible to judge how the patient has met the customary demands of life.

We turn next to the present illness and inquire in particular about its onset, duration, course, and response to previous treatment. The emotional climate in which an illness begins is invariably important.

Previous ill-health should be noted and resemblances to the present illness. Special attention should be given to illness of a like kind in a member of the patient's family. His father may have died of cancer; his mother may have had headaches, indigestion, and a "dicky heart." The danger of psychological infection is considerable.

A fear of insanity haunts some patients and they are relieved when the subject is mentioned. They want to know if their illness is "mental." Reassurance should be deferred until the examination is finished, when it can be given with conviction—provided there is no evidence of psychosis. Similarly, the subject of suicide should be raised with the depressed patient, particularly if there is early morning waking and self-depreciation. Such inquiry will not influence the patient towards suicide, nor will he be deflected from it by the (untrue) remark that those who speak of committing suicide do not do so. Nearly all depressed patients have suicidal thoughts; and, in face of the responsibility which the family doctor is called on to bear in the management of a suicidal patient, he is justified if he calls in a specialist.

"How has the illness changed you? Were you a different sort of person previously?" Inquiries of this type are often productive. The doctor's own attitude to the conduct of life will be fully evident by the tone of his questions. If this rings true, the patient will speak freely on any subject.

The physical examination, an essential part of the investigation, is best made when rapport has been established, rather than at the beginning of the interview. The relevance of the state of mind to that of the body becomes evident when seen against the background of personal development and social adaptation.

During the examination the intelligent patient should be given some explanation of his illness: that emotion always affects the functioning of the body and this may become pronounced at times (for example, blushing, tachycardia, polyuria), and that the symptoms are not "diseases" but upset and disturbed normal processes. The patient with palpitations may think he has heart disease. Perhaps he has been told that he has high blood pressure or that his heart, although sound, is not quite healthy. Behind the fear

of going out alone may be the fear of falling down dead. Most laymen believe that life hangs by a thread if there is anything whatever the matter with the heart. The patient with abdominal pain may think he has cancer, but is afraid to ask lest his fear be confirmed. Doctors are often too reticent, too cautious, and even disposed towards a bad prognosis. Optimism is usually more justified than—to the patient—ominous silence. Notice the relief of the patient on hearing: "Your heart is sound, anyhow"; "There is no growth, no sign of cancer." Organic disease may be accompanied by an ill-defined feeling of anxiety arising probably from reduced efficiency, so the physical examination should be thorough. But with the anxious patient it should not be repeated without good reason. Disordered emotions, rather than organic disease, are far more likely to be present, and the danger of treating an anxiety state as an organic illness is considerable.

The number of intellectually dull persons in the community is high, and they often contract anxiety states or other neuroses. Failure to pass routine school examinations and frequent changes of work suggest intellectual and social defect. The doctor will often get a shock if he asks a few simple questions in mental arithmetic or in general knowledge. (A smartly dressed girl of 16 insisted that there were 20 half-crowns in 30 shillings.)

Too much should not be expected from explanation and reassurance. The friendly and genuinely interested doctor increases the patient's self-respect when he listens to him, explains modestly, and gives reassurance only after careful examination. But the anxiety state may well need special treatment, and this should not be withheld in favour of sending the patient for a "complete rest"—a form of management with little to commend it.

Hypnotics and sedatives, as supplementary aids, are valuable. But when given again and again, without any effort at enlightenment, the patient is encouraged to accept "nerves" as a permanent disability. When the patient has some insight into the nature of his illness the sedative is given as a temporary measure to allay tension and not as a "nerve tonic."

Patients may mention the housing shortage and financial and business worries as "getting them down." While these are important, they are usually secondary to the patient's relation to his family and others, which if not central is again and again a crucial matter in the anxiety state. The tire-some elder sister, the alcoholic parent, the unhappy marriage, may be linked with the illness although the patient has not observed any association. The doctor should not attempt to sort out family troubles, but his patient will be helped by speaking of them and helped far more than by a tonic and advice not to worry.

An interview conducted on these lines will take perhaps half an hour. But it results in a clear picture of the patient as a whole, and in the long run time will be saved. A patient can get lasting benefit even in one interview, particularly in the early stages of the illness, provided he is given some element of insight into his illness. During the interview the doctor should bear in mind the importance of an affirmative diagnosis in the anxiety state—that is, a diagnosis which rests upon the presence of morbid anxiety. A diagnosis of "functional" or "nerves" reached by the exclusion of organic disease is of little value, as it gives no information about the nature of the illness or the person who is ill.

Relatives quite reasonably ask about their demeanour to the patient: should he be "made to do things" or "given-in-to"? The cue here—and the same holds for every medical interview—is that the patient should be accepted as being ill and thus entitled to help and encouragement. The patient will lose courage if bombarded by good advice and allusions to will-power.

Psychiatric illness is seldom clear-cut, and so the interview is designed on general lines and is suitable for a wide range of patients. It is well to cast the net wide, for apparent irrelevancies often turn out to be important.

FIRST WORLD CONFERENCE ON MEDICAL EDUCATION PROCEEDINGS OF SECTIONS

The Conference continued to meet in four Sections, which held simultaneous meetings on August 26, 27, and 28. Their proceedings are reported below in continuation of the reports in last week's Journal (pp. 486-9)

SECTION A: REQUIREMENTS FOR ENTRY INTO MEDICAL SCHOOLS

Wednesday, August 26

Section A, presided over by Dr. DONALD G. ANDERSON, continued its discussion on the general theme of the requirements for entry into medical schools.

Teaching the History of Science

Professor A. PAZZINI (University of Rome) insisted that the teaching of the history of science was not a question of the assimilation of names and dates, but rather of enabling the student to understand the evolution of science, the development of ideas, and the creation of a scientific consciousness. He was followed by Professor M. MOUQUIN (University of Paris), who stressed the value of films and museum panels.

Dr. MOGENS PIHL (Denmark) rejected compulsory teaching of the history of science and favoured an historical study of specialized subjects rather than a general course. Professor L. JUSTIN-BESANÇON (France) thought that films on historical subjects should be televised. Dr. MORRIS FISHBEIN (University of Illinois, U.S.A.) said the history of medicine must be written in the biographies of great doctors, and wanted the development of ethics and medical law taught as separate disciplines. Professor F. A. SONDERVORST (Louvain) reported that the Belgian Committee for the History of Science had invited the Government to set up chairs in the history of medicine in all four universities. Dr. M. M. WEAVER (University of British Columbia) considered that the incoming medical student benefited by a prescribed course in the history of medicine. Dr. ST. GEORGE B. DELISLE GRAY (United Kingdom) and Professor JOHN P. HUBBARD (University of Pennsylvania) also spoke.

Teaching Scientific Methods

Professor GUSTAV NYLIN (Stockholm) pointed out that it was inconceivable that the undergraduate student could be given a comprehensive knowledge in each branch of his studies. The introduction of an additional subject, "Scientific Methods," would, in his opinion, be inexpedient. But it would be productive and practical to allow time in each branch of medical education to give striking and inspiring examples of the manner in which scientific methods had evolved. Professor H. SCHULTEN (West Germany) also spoke on this subject.

The Value of Mathematics

Professor P. BONNEVIE (University of Copenhagen), in speaking under the title "Science is Measurement," said that this had been explained by the Programme Committee as covering the problem of including some mathematics in the premedical period so as to prepare the student for his introduction to medical statistics at a later period. But the subject had another meaning—the use of mathematics as a tool for all natural and social sciences, by reducing observations to figures and attempting to record experiences in terms of quantitative laws.

Miss DIANA DYASON (Lecturer in the History and Methods of Science, University of Melbourne) then described her experimental premedical course.

Thursday, August 27

Biology a Fundamental Study

On Thursday morning the place of biology, physics, and chemistry in medical education was discussed, with Dr. EDWARD L. TURNER (Washington) in the chair.

Professor JEANE VERNE (University of Paris), speaking on the role of biology in student training, described how the teaching of this subject was carried out in France. At present the premedical year closed with an examination. Owing to the great numbers seeking to enter the medical profession it had been proposed that in the large schools the examination should be replaced by a competition. But such a competition might well favour students with superficial knowledge and work to the disadvantage of others who had in them the makings of an excellent doctor.

Professor W. BARGMANN (University of Kiel) did not favour the teaching of biology to medical students only, as proposed in Germany. Before entering the university, pupils must be acquainted with the world of organisms. It was the task of the schools to provide basic knowledge of biology.

Miss M. L. JOHNSON (University College) doubted whether biology, as usually taught, really developed the powers of observation. Students saw things which they thought were there, and failed to see things which they thought ought not to be there.

How Much Physics and Chemistry?

Dr. H. C. BURGER (University of Utrecht) outlined the course of medical physics which was given at his university. Fifty lectures were given in the first year, and practical work was done on 16 afternoons. The teacher in medical physics must also be a research worker in close relation with the medical world.

Professor E. C. DODDS (University of London) said it was obvious that the whole of the teaching of chemistry should be aimed at an understanding of the structure and properties of those substances which occurred in the body and took part in metabolic processes. It was upon this field that chemical education should be concentrated. It was also necessary to study the chemical structure of drugs.

Mr. J. B. JEPSON (University of London) defined the aim as being enough chemistry to enable practitioners to appreciate advances in medical science. Dr. C. D. LEAKE wanted more chemistry.

Dr. W. E. S. MERRETT (Principal, Kano Medical School, Nigeria) said that as a physiologist he wanted students to know the hydrodynamics of the movement of fluids through tubes, but such things came only in advanced courses of physics and chemistry. One answer was to teach these subjects, but with a special medical bias.

Dr. A. S. M. NAYAR (Madras) and Dr. M. TALAAT (Egypt) also spoke.

Introduction to the Social Sciences

Professor T. S. SIMEY (University of Liverpool) said that the social sciences amplified the natural sciences and showed the student the way in which scientific method could be applied to the study of persons. He hoped that the social sciences would develop in the medical course as a simple means of enabling the student to understand those aspects of human nature which were important to the medical practitioner in his work.

Selection of Students

Dr. A. E. SEVERINGHAUS (Columbia University, New York), in a paper read by Dr. ALAN VALENTINE, stated that in the United States no group of applicants for entry to a profession were more carefully screened than those who wished to enter the medical schools. In 1952 there were 16,760 applicants for 7,425 places.

"I look for a quality which, for want of a better term, I call 'warmth,' but I feel wholly unequal to the task of trying to tell you how I arrive at a decision in this matter."

Friday, August 28

Intelligence and Aptitude Tests

In the final session, Sir FREDERIC BARTLETT, former professor of experimental psychology at Cambridge, opened a discussion on the value of intelligence and aptitude tests. He considered that an attempt ought to be made to find a form of tests in which the "answer" must exhibit not only a final issue but also the steps by which it was approached and eventually achieved. Sir Frederic gave the first public statement on the results so far achieved in the Medical Research Council's long-term investigation of the selection of medical students. He confined himself to that part of the investigation which was concerned specifically with the use of tests. The tests used were AH5, a Cambridge high-level intelligence test widely standardized on students of university type; a group of pattern-perception tests; and the well-known N.I.P. Group Test 33. The correlations between test performances and examination results lay between 0.2 and 0.4 for the first M.B. (the higher figure representing only a very small part of the total population); and between -0.1 and 0.3 for the second M.B. To rely on such tests alone, or principally, would be fantastically silly—unless, of course, there was something wrong with the examination. There might be many reasons for the association between test and examination success being even lower for the second M.B. than for the first M.B., but it was difficult to avoid the conclusion that test results might become of smaller and smaller significance the longer the time that elapsed since they were achieved. The view that tests of this kind revealed stable, relatively unalterable, human properties was almost certainly wrong. Once a doctor got into the world it did not seem as if it was intelligence which counted for a great deal, but personality. Ability tests, however, might be useful if applied at a late stage of training, not compulsorily but for guidance.

Professor E. ASK-UPMARK (University of Upsala, Sweden) reported that in Sweden they had found a definite correlation between the record of a student in anatomy and his record in the clinical years.

Professor G. PATRICK MEREDITH (University of Leeds) said that university examinations did not depend entirely on intelligence. They depended a great deal on hard work and character.

Dr. H. E. THELANDER (University of California) had found that tests which tested a person under stress were the ones most likely to correlate with performance. Others speaking in the discussion were Dr. J. VAN LENNEP (Belgium) and Professor W. M. MILLAR (University of Aberdeen).

The Method and Value of the Interview

Dr. S. G. VENGSAKAR (Tapiwala National Medical College, India), considering the method and value of the interview, defined the purpose of an interview as being to provide the applicant with an opportunity to display his personal qualities. The candidate should be given every opportunity to present himself favourably.

Professor GORDON KING (Hong Kong) compared the results of two "selected" years of students with two "unselected" years of students at Hong Kong, the former students being admitted after interview, the latter only on the results of the matriculation examination. The 1946 (unselected) group of students was an older group whose determination to study medicine had remained alive through five years of war, and a high proportion survived to sit the final examination. In the remaining three years (selected and unselected) little difference was noticed. Further, over 70% of students in the lowest gradings, according to interview, and only 20% of those in the highest, survived to sit for the final examinations.

Dr. T. A. DIVINE (Leeds University) commented that one could find from a personal interview the appearance of a candidate and his background, and assess his motive. Dr. E. R. BOLAND (Guy's Hospital Medical School) agreed that personal judgments could be fallacious but believed more accurate than inaccurate ones were made. He would rather

Dealing with the interview as a method of selection, Dr. Severinghaus said that at his school about one-quarter of the applicants were interviewed, and no student was admitted without an interview. However, an experienced interviewer was necessary.

Professor S. SUNDERLAND (University of Melbourne) said that there was a need for more well-trained doctors; at the same time suitably qualified students were presenting themselves in ever-increasing numbers. It seemed odd that the reaction to such a situation should be to embark on a policy of selection for entry into medical schools. The stage had now been reached where students were being coached for interviews. Interviews were not used at any subsequent stage of the student's career, and it was therefore unfair to emphasize them when he was applying for entry to the course. Melbourne University had decided to base selection solely on examination results at the end of the first premedical year. It resulted in overcrowding, but it gave all prospective medical students a chance to compete under substantially the same conditions.

Professor W. W. GREULICH (Stanford University, San Francisco), a member of an admission committee, said he had been impressed by the number of times the estimate of a candidate by equally critical, equally qualified people had differed. Dr. W. G. SMILLIE (Cornell University) and Dr. S. G. VENGSAKAR (India) also spoke.

Dr. DENIS BRINTON (St. Mary's Hospital, London) described the selection of students in the United Kingdom. The procedure was divided into three stages: perusal of application form and confidential report; the interview; and the student's first year in the school. Not a few psychologists had been critical of the value of the interview, because the test was incapable of standardization and control. But as yet there was no scientific means of measuring personality. Experience had shown that a student who failed the premedical examination seldom avoided worse trouble later.

Student Selection in India

Professor S. S. MISRA (Lucknow University) said that there were now in India 29 undergraduate medical colleges, as compared with 16 in the undivided India of 1947. About 2,000 undergraduate students were admitted every year for a five-year undergraduate course. Not more than between 30 and 40% of these students qualified in the minimum period. There were about 50,000 qualified doctors in the country, with its population of 350 millions—a ratio of 1 in 7,000. Even with the increased number of medical colleges and admissions it was not expected that there would be more than 2,000 newly qualified medical men each year—a totally inadequate number. Student selection was based on an assessment of previous scholastic achievement, and an additional premedical test. The low admission age (17), the lack of insistence on a more liberal education, and the absence of an aptitude test were responsible for the admission of many unsuitable students.

Dr. T. B. DAVIE described observations being made at the University of Capetown. Professor M. TALAAT (Alexandria University, Egypt) noted the importance of selection of teachers. Dr. DAG KNUTSON (Stockholm), Dr. MUSA GHANTUS (Lebanon), and Dr. ST. GEORGE B. DELISLE GRAY continued the discussion.

Describing student selection in Canada, Dr. M. M. WEAVER (University of British Columbia) said that medical schools in Canada were reluctant, or refused completely, to accept into the final four years in medicine anyone younger than 19 or older than 30. Lack of emotional stability or some other personality disorder might be a determining factor in the rejection of a borderline applicant. Other factors which it had been found helpful to discuss with borderline applicants included health and physical adequacy for the medical course, reading habits, the applicant's reason for wishing to become a doctor, and what he intended to do after qualification.

Dr. M. D. PENAS (University of Santo Tomas, Manila, Philippines) and Dr. MARCEL POUMAILLOUX (Paris) also spoke.

select a wife after a 20-minute interview than on the results of a competitive examination. Dr. JOHN B. LAGEN, also supporting the interview, said that when selection at the University of California was based entirely on marks there was a total "mortality" of 20-25%. During the last seven or eight years, with a selection interview, the mortality had been 7 or 8%. Professor W. M. MILLAR (University of Aberdeen) said an interview afforded the student the opportunity of making a good human relationship with some members of the faculty at the outset of his career.

SECTION B: AIMS AND CONTENT OF THE CURRICULUM

Wednesday, August 26

Section B, with Sir A. L. MUDALIAR in the chair, continued its discussion on the aims and content of the curriculum.

The Doctor is Human

Professor W. MELVILLE ARNOTT (Birmingham) said that it was sometimes suggested, mainly, he suspected, by those who because of poor education or intellectual indolence had fallen behind, that the scientific element in medical practice was in some way antagonistic to human kindness. This was a mischievous slander which carried little weight among intelligent people. It was just as much a crime against science as against humanity for a doctor to fail in human kindness or in sympathy. The doctor must realize that even though he could do little or nothing to stay the course of an illness his very presence gave comfort and support to the patient and the relatives. All these and many other less tangible elements in good doctoring could not be taught as formal items in the syllabus, but they could be inculcated by example.

Professor W. LÖFFLER (Switzerland) was inclined to the view that one of the chief troubles in medical teaching was that some people overestimated the practical side and others the theoretical side; it seemed advisable to synthesize the two. Any educational system must also be in accord with the mentality of the country concerned.

Dr. S. C. SEN (India) thought the time had come when medical ethics should form a very important part of the medical curriculum.

Mr. A. B. GILMOUR (Hon. Secretary of the British Medical Students Association) said that general practice was the one branch of medicine of which students knew nothing until they were qualified. They would like to have a greater knowledge of the atmosphere of general practice and all its difficulties.

Other speakers were Dr. E. ASK-UPMARK (Sweden), Dr. JOSE A. BUSTAMANTE (Cuba), Professor LEON GERIN-LAJOIE (Canada), Dr. DAG KNUTSON (Sweden), Dr. J. A. PRIDHAM (U.K.), and Dr. J. L. TROUPIN (U.S.A.).

The Introductory Clinical Course

Professor L. JUSTIN-BESANÇON (University of Paris) spoke on the introductory clinical course, in particular the influence exercised on the preliminary instruction by a knowledge of the nature of the practice which the student would follow after qualification. Must the young doctor whose career might be spent in clinical practice in a village or small town be required to undergo the full round of training in laboratory work, microbiology, radiology, and so forth? He urged that the conception of medical instruction must allow for differences, alike in method and in purpose.

Sir LIONEL WHITBY (Cambridge) spoke of the fundamental need to stimulate and encourage students' powers of observation. A student's introduction to clinical medicine in the wards should not begin with his learning the names of diseases, but with his learning how to express what he had seen, felt, or heard. Complete familiarity with the normal led quite naturally to an extremely quick observation of the abnormal.

Dr. A. C. DORNHORST (U.K.), Professor FELIX HURTADO (Cuba), Dr. DAG KNUTSON (Sweden), Dr. J. G. ORCOYEN (Spain), and Dr. M. PRYWES (Israel) also contributed to the discussion.

Teaching of Psychological Medicine

Professor D. EWEN CAMERON (McGill University) said that the teaching of psychological medicine in the undergraduate curriculum could not be exclusively concerned with hysteria and mental deficiency, with schizophrenia and manic-depressive psychoses. They would entirely fail to rise to the challenge of the times to produce physicians fit to lead the great enterprises of modern health if they so limited themselves.

Professor A. MILLAN (Mexico) emphasized the need for students to understand the mind as well as the body of patients. A patient seeking a physician's aid was not merely an animal whose symptoms could be linked with a disease.

Professor A. LAMACHE (Rennes) considered it absolutely necessary that those who studied the body should study also the psychological mechanisms which were constantly in operation; while Professor D. DE SOUZA (Brazil) thought that the emphasis should be on the student and not the patient, the first essential being that the student should know and understand himself in order to have an adequate appreciation of a patient's emotions.

Other contributors to the discussion included Dr. JOSE A. BUSTAMANTE (Cuba), Dr. OLIVER COPE (U.S.A.), Dr. M. ISELIN (France), and Dr. CHAUNCEY D. LEAKE (U.S.A.).

Thursday, August 27

Medicine and Surgery as One Discipline

On Thursday morning Dr. OLIVER COPE (Harvard) discussed the teaching of medicine and surgery as one discipline. He considered that much might be gained if the departments of medicine and surgery were willing to combine in the teaching of undergraduate medicine. A number of diseases, such as those of the gastro-intestinal tract and the endocrine organs, were traditionally taught by both departments. Consultation could be readily achieved, and where differences in point of view still existed combined group teaching by interneers and surgeons could be arranged. The difficulties of such a situation were largely emotional.

"The interneer would not be bothered with his technical-minded colleague, the surgeon. The surgeon, considered by tradition intellectually inferior by the interneers, would be anxious, ready to have his feelings hurt, and therefore assertive from the start. But it is worth a try."

Professor A. ASENJO (University of Chile) agreed that the teaching of internal medicine and surgery should be carried out as one discipline, only separated into parts dedicated to treatment and to examination with very specialized techniques. This teaching should be carried out not only in hospital but in family surroundings.

Dr. J. A. MACFARLANE (Canada) said that if they were not to give consideration to the easement in some way of the medical curriculum then students were going to continue to spend more and more time going to lectures and tutorials.

Professor PATRICK KIELY (Ireland), Dr. T. SCHAFFER (South Africa), Dr. M. ISELIN (France), Dr. S. C. SEN (India), and Dr. A. P. THOMSON (Birmingham) also spoke in the discussion.

Teaching of Minor Surgery

Mr. WILLIAM GISSANE (Birmingham Accident Hospital) declared that the term "minor surgery" implied neither importance nor respectability—a bad introduction to the presentation of any subject in undergraduate teaching. Such an introduction had some other shortcomings. There was no purposeful attempt to build on the knowledge the student had already gained in the departments of physiology, anatomy, bacteriology, and pathology. "Minor surgery," as generally taught, placed too much emphasis on the operat-

ing act, the use of tools, the names of splints and patterns of bandages, and not enough upon the surgical principles behind the act and the use of the tools.

Dr. M. ISELIN (France) said that the student must be taught to know the type of surgery he could perform himself as distinct from that for which it was necessary to have recourse to surgical specialists.

Dr. ST. GEORGE B. DELISLE GRAY (U.K.) regarded minor surgery as that which could be—and should be—carried out by the general practitioner.

Professor A. SPINELLI (Rome) said that it was agreed in his country that students wasted their time in attending the performance of major operations. Further contributions to the discussion were made by Professor F. A. SONDERVORST (Louvain) and Professor L. G. TORNEL (Spain).

The Teaching of Obstetrics

Professor DUGALD BAIRD (University of Aberdeen) said that the teaching of obstetrics varied according to the organization of obstetrical services from one country to another, and according to national customs and the stage of evolution reached. In Britain, on the assumption that only a proportion of graduates, and only those who had had postgraduate experience, would practise midwifery, undergraduate training was now much more general and less technical than it used to be.

The standard of management of pregnancy and labour in the best maternity hospitals was now so high that the general practitioner must find it increasingly difficult to compete unless he had had special training or had constant practice under favourable conditions.

Mr. H. K. PACEY (New Zealand) then described obstetric trends in his country, where there were a well-organized medical service and a national maternity service that had operated with great smoothness since 1940.

Dr. F. M. ROSE (U.K.) was of opinion that in the teaching of the medical student the dangers inherent in pregnancy and parturition were sometimes overstressed. This country was maintaining a very expensive hospital service, and maternity beds were sometimes needlessly filled with cases which could quite well be confined at home.

Dr. MARY ESSLEMONT (Medical Women's Federation) suggested that, as they were so few, all the maternity patients in teaching hospitals should be reserved for the medical students; it was possible to arrange for patients in non-teaching hospitals to be available for midwives.

Other speakers on this subject were Dr. ST. GEORGE B. DELISLE GRAY (U.K.), Dr. G. MOUTHON (France), and Dr. J. G. ORCOYEN (Spain).

The Teaching of Paediatrics

Professor ALAN MONCRIEFF (University of London) raised the question, "Is paediatrics a branch of medicine?" In general terms paediatrics was medicine at a special age period. Usually it came into the second year of clinical studies, after a basic period of six months had been spent in internal medicine and a similar period in surgery. The General Medical Council would like to see midwifery also precede paediatrics. Clearly work on the newborn baby must be concurrent with midwifery, and this was a useful introduction to child health. It would appear that paediatrics should come somewhere towards the middle of the second year of clinical studies, after general medicine, surgery, and obstetrics, but before the specialties. With regard to the new compulsory year, a paediatric post might be suitable in the second half of this year, but not for the first six months.

Professor G. M. H. VEENEKLAAS (Netherlands) said that lectures should be given less frequently.

Dr. F. M. ROSE (U.K.) said that hospitals were reluctant to admit young children unless it was vitally necessary, or in cases where separation from the mother was not an important factor. Consequently, instruction in paediatrics

might be enriched by teaching on material from general practice where one encountered cases not normally admitted to hospital.

The Place of the Specialties

Dr. H. G. WEISKOTTEN (Chairman of Council on World Education and Hospitals, American Medical Association) said that practice in the specialties had become so popular that from 60 to 70% of the recent graduates of medical schools of the United States of America had been undertaking intensive graduate programmes and then limiting their practice to a specialty. Many were complaining that the graduates looking forward to general practice now received inadequate training in the specialties during their intern or residency period. This was particularly true with regard to their training in dermatology, which was said to be a subject they had to deal with in 15% or more of their patients. In the United States too little emphasis had been placed upon the educational value of out-patient clinics.

Dr. W. W. S. JOHNSTON (Australia) said that teachers in specialties should constantly keep in mind the necessity for a balanced view so that the subject concerned was properly related to general medicine as a whole.

Lieutenant-Colonel SANGHAM-LAL (India) thought there was a tendency nowadays for cases to be referred to specialists unnecessarily, but there was also a definite risk of patients being treated by their general practitioner for far too long before being referred to a specialist. Who was better qualified than a general physician to train students in knowing where to draw the line?

Dr. S. C. SEN (India), who said it was far more difficult to be a good general practitioner than a good specialist, felt that less importance should be given to the specialties.

Professor W. MELVILLE ARNOTT (U.K.), Professor E. HUSFELDT (Denmark), and Dr. F. M. ROSE (U.K.) also spoke.

Teaching of Tropical Medicine

Dr. L. E. NAPIER (formerly professor of tropical medicine, Calcutta) referred to the doctors who went to the war areas in 1939 and successive years and found they were ill-equipped because they had not got a sufficient grounding in tropical diseases as a result of their undergraduate training and experience in temperate climates. It was necessary in a contracting world for treatment of tropical diseases to form part of the curriculum.

Sir GEORGE MCROBERT (U.K.) emphasized the particular importance of students in temperate climates being taught the fundamentals of malaria and amoebic dysentery, and other speakers shared the view that it was necessary for students to be made familiar with general questions of tropical medicine.

The Intern Year

Sir DAVID CAMPBELL (President, General Medical Council) said that it was odd to find one of the subjects chosen for discussion at the Conference "Is an intern year necessary?" He thought that was settled. The idea of the intern year was very old. In connexion with the study of medicine at Salerno the Emperor Frederick II in 1221 decreed that no one should study medicine unless, *inter alia*, his five years' medical course had been followed by an additional year of practice under the supervision of an older practitioner. No doctor who had served an internship in a teaching hospital could fail to appreciate that he had had a vital educational experience. Among other advantages of making internship compulsory was the fact that it imposed fairly and squarely on the universities the duty of approving hospitals and posts and of keeping an eye on the nature of the training and experience to be had therein.

Dr. M. PRYWES (Israel) said that since an intern year had been made compulsory in his country the standard of medicine in hospitals there had been very substantially raised.

After the discussion on this subject the Section adjourned for the day.

Friday, August 28

The Undergraduate and General Practice

On Friday morning the first paper was one in which Professor A. L. RICHARD (University of Ottawa) introduced the subject of the undergraduate and general practice by giving a definition of the general practitioner. After listing certain requisites of knowledge and skill, he said that the general practitioner should always be able to do something for his patient, if it was only to have an insight into the probable developments of the patient's disorder. A large part of the success and usefulness of the general practitioner would depend upon the influence which he exerted upon his patients, the confidence which he infused, his power to explain, persuade, and inspire. These powers were more easily wielded by a man of general culture and education than by one who had had only training in the field of exact science.

Dr. E. A. GREGG (Chairman of Council, British Medical Association) said that there were many motives which led men and women into medical practice, but he thought there were still quite a few people who went into it with the desire of devoting themselves to the welfare of their fellow human beings, and that idea was well worth cultivating in the young student. The teaching of the family doctor should be *eminently practical*. Most emphasis should be laid upon his acquiring skill and ability in using his eyes and hands and in thinking while doing so. The main place in which a doctor learnt his work was not the medical school or the wards, but the out-patient department.

Dr. RICHARD SCOTT (University of Edinburgh) described a unit for teaching general practice which had been established in Edinburgh in 1948 in order to demonstrate the indivisibility of medicine and to illustrate the social aspects of health and sickness. The primary concern of this unit was not, he explained, vocational training for future general practitioners; rather, it provided an opportunity for senior students to be confronted with a patient-doctor situation which they could resolve only by integrating for themselves a great deal of what they had learnt elsewhere.

Other speakers were Dr. J. R. ELLIS (U.K.), Professor A. LAMACHE (France), Mr. R. W. HESLOP (British Medical Students' Association), Dr. J. CASTRO-VILLAGRANA (Mexico), and Drs. ST. GEORGE B. DELISLE GRAY, A. TALBOT ROGERS, and F. M. ROSE (U.K.).

The Balanced Curriculum

Sir HENRY COHEN (University of Liverpool) said that our overcrowded and confused curricula showed that we had vacillated between whether the aim of the undergraduate curriculum was to produce a good general practitioner or to lay the foundations of a medical career whatever branch of medicine was later to be followed. Spectacular discoveries in diagnosis and treatment had made increasing specialism in their techniques inevitable. Meningitis, pneumonia, malaria, subacute bacterial endocarditis, and diphtheria, to mention only a few infections, must be portrayed to-day in patterns which were unknown 20 years ago. The use of special procedures had enabled exploration by x rays into practically every crevice and cavity of the human body. With so vast an increase in the corpus of medical knowledge it might well be asked how could the doctor be any longer expected on qualifying to be an efficient practitioner of medicine, surgery, and midwifery. The undergraduate curriculum could not embrace the whole theory and practice of medicine; it could not attempt to teach the techniques required in the practice of specialties. It must limit its aim to laying the foundations of the doctor's training. Since medical knowledge was ever expanding, the undergraduate curriculum must favour the acquisition of enduring habits of work and thought and of enthusiasm for study, so that the doctor would remain a student throughout his professional life. The growth of knowledge in both medicine and in

educational methods meant that a curriculum could never be final; it was always moving to that end, but it never arrived.

Professor TOMIO OGATA (Japan) said that if medical students were taught only what was essential, fundamental, and necessary for their future activities, and nothing more, they would not feel satisfied. They should be informed—not necessarily taught—about certain phases of actual progress in medical science.

Dr. JOHN BURTON (U.K.) said that *doctor* meant *teacher*, and one of the sources of imbalance in most curricula was the fact that the student was regarded as an empty vessel into which knowledge had to be poured, and never as the doctor who had got to be the teacher of the future.

Professor PATRICK KIELY (Ireland) asked if they were not overemphasizing the itinerary which the student should carry in his pocket as against the ideology which he should have in his mind.

Dr. J. G. ORCOYEN (Spain) and Dr. L. BINBAYYA BIDYABHED (Thailand) also spoke in the discussion.

SECTION C: TECHNIQUES AND METHODS OF MEDICAL EDUCATION

Wednesday, August 26

The general theme in Section C was the techniques and methods of medical education. The Wednesday morning session was devoted to medical illustration, and many examples were shown of visual aids, the cinematograph film, and the still picture. Professor A. GARRETTON-SILVA (Chile) presided over this session.

Visual Aids in Education

Dr. P. N. CARDEW (St. Mary's Hospital) said that visual methods of education had in the past proved a controversial subject, especially when applied at university level of study. There had been a feeling that while they might be suitable for schoolchildren the written or spoken word was more dignified and appropriate for a learned profession. Yet many newly qualified doctors remembered the symptoms of a disease by visualizing a certain page of their favourite textbook. The visual memory was receptive and tenacious but could as easily be confused by poor illustration as stimulated by the expert use of visual symbols. Dr. Cardew described the varied uses to which lantern slides, still pictures, and motion pictures could be put.

Dr. KENNETH SODDY (World Federation for Mental Health) discussed the uses of the one-way observation screen. Its main value clinically was in the observation of the behaviour of young children, but, with the patient's consent, it had obvious uses in the field of psychological medicine.

The Moving Picture in Medical Education

Mr. RALPH P. CREER (American Medical Association) said that educational psychologists were of opinion that the rate of learning was based on experience; therefore one of the most effective methods of teaching was to provide direct experience or an adequate substitute. That was where the use of the motion picture came in, for many types of previously unobtainable experiences were now only as far away as the motion picture projector.

But, like other aids to teaching, motion pictures had their limitations. They placed a new responsibility on the teacher, for they involved special preparation and a new method of teaching.

The Still Picture

Professor TOM JONES (University of Illinois) discussed the group of visual teaching media referred to as still pictures. These included all forms of inanimate pictorial representations, from simple blackboard diagrams to full colour photographs and drawings. Still pictures were more widely used to-day in medical schools than either motion

pictures or three-dimensional material. It would be difficult to imagine anatomy, pathology, and surgery being effectively communicated without photographs and drawings.

Tracing the history of medical illustration, Professor Jones said that probably no single event had contributed so much to the advancement of medical knowledge as the basic discovery of photography with all that it implied. With the necessity of crowding into a curriculum all the material now considered necessary for the training of a physician or surgeon, newer methods of teaching had to be found. Language must always be the main stream of communication, but, to quote a report on the use of audio-visual aids in the U.S. Armed Services: "The concepts of more learning in less time, of greater retention, and of more realistic instruction have reinforced the contention that learning can be facilitated and made more meaningful through appeal to all the senses."

Among those who took part in the discussion or made comments on the examples shown were Professor G. P. MEREDITH, Professor ROBERT CRUICKSHANK, Mr. C. E. ENGEL, Dr. PATRICK COLLARD, Dr. PETER HANSELL, Dr. JOHN BURTON, Dr. ROBERT OLLERENSHAW, and Mr. A. B. GILMOUR, honorary secretary of the British Medical Students Association.

Thursday, August 27

The Lecture and Group Discussion

On Thursday morning, with Professor A. Hurtado in the chair, Professor G. P. MEREDITH (University of Leeds) discussed the art of lecturing and of organizing discussions. He listed three main reasons for the ineffectiveness of many lecturers: faulty delivery; the forcing of words to perform functions for which other media were more appropriate; the distribution of the lecturer's attention over too many techniques. The lecture was not the appropriate medium for the presentation of factual information. Its primary function was the communication of theoretical concepts. His impression was that in university teaching generally there were too many lectures. The effect of the lecture should be the establishment of a new concept or group of concepts in the mind of the student. On the other hand, the discussion group was adapted to exploring the implications of concepts and to answering all those questions which immediately arose in the mind when new concepts were grafted on to old knowledge.

Mr. K. H. McALLISTER (Further Education Organizer, Somerset County Council) said that group discussions ensured a flow of ideas. With the lecture it was often the bright members of the audience who were the pacemakers, and the teacher adjusted himself to their standard.

Professor IAN AIRD said that at a recent conference in London on the application of group methods in medicine a hundred medical teachers separated themselves into four groups, each with a non-medical educationalist to guide it. The technique was a little difficult at first, but it quickly became obvious that it might have a real and practical application to clinical medicine. Dr. JOHN BURTON (Director, Central Council for Health Education) said that the group discussion method had the advantage of putting the teacher in a position of finding out what his students really knew, what were the emotional barriers to their learning, and how he could adjust his teaching to their levels and concepts. Further, in a discussion group, a teacher was examining while he taught. Dr. VICTOR SORIANO (Uruguay) said that in his school the lecture and discussion group systems were combined, and the lectures always ended with questions. Professor S. S. MISRA (University of Lucknow) said that he had found that frank confession by the teacher that he could not answer a student's question did not diminish the teacher's prestige.

The Full-time Teacher

The full-time system of appointment to the teaching staff in the Faculty of Medicine, as followed at the University of Chicago, was described by Dr. L. T. COGGESHALL, dean of the Division of Biological Sciences in that university. The

physicians so appointed were free to follow their three major interests and responsibilities, namely, teaching, engaging in scientific research, and giving medical care, "without the limitations and distractions" generally imposed by private practice. The system had been successful in fulfilling the primary functions of a medical school, though the speaker admitted that such a system might not be universally applicable to the purposes of medical education.

Professor H. B. WULFF (Lund University) said that if doctors and money were available the full-time system was excellent, but it was a good thing, nevertheless, for many schools to have well-paid teachers, not full-time, but allowed a strictly limited private consulting practice.

Professor FELIX HURTADO (Cuba) said that the full-time system was inappropriate in his country because such a professor would be unduly limited in his experience of patients.

Dr. FRANK FREMONT-SMITH (New York) said that the main disadvantage of the full-time system was that it tended to isolate teachers from the realities of medical practice in the communities which surrounded their medical schools, and therefore there was a tendency for them to teach a practice which would be far removed from what most of their students encountered later in their career. Mr. D. H. PATEY (Middlesex Hospital) said that in England consultants got very good payment for the work they did under the National Health Service system, and therefore there was an opportunity for those connected with hospitals to devote their major energies to teaching and research. Professor E. HUSFELDT (Denmark) held that the university professor should have some private practice. Dr. M. POUMAILLOUX (Paris) said that a doctor who devoted the whole of his life to hospital practice and had no private practice had no normal conception of medicine as it was to-day.

The Place of the Textbook in Teaching

Professor MAURICE MULLER (University of Lille) said that the teaching of medicine could be divided into three parts: primary teaching leading to a doctorate, supplementary teaching enabling the doctor to keep his knowledge up to date, and higher education which led to hospital and university appointments. In each stage different textbooks were needed.

Professor J. E. DEBONO (University of Malta) said that he had no quarrel with textbooks in general, but he had some quarrel with the textbook—the book which the student considered to contain all necessary knowledge. This was a snare and a delusion. Textbooks were not meant to be read right through, but to be dipped into. Professor H. WENDEROTH (Germany) and Professor J. N. P. DAVIES (Uganda) also spoke.

Library and Reference Services

Lieutenant-Colonel FRANK B. ROGERS, director of the Armed Forces Medical Library, Washington, discussed the value of library and reference services in undergraduate medical education. He said that in the United States more than half the schools gave instruction in the use of the library and in bibliographical methods. The librarian could show the student that there were better ways of finding material than by paging aimlessly through volume after volume of likely journal titles.

Mr. C. C. BARNARD (Librarian, London School of Hygiene and Tropical Medicine) said that the library should be an integral part of a school and the librarian a member of the teaching staff. He outlined a scheme which was in operation at his school consisting of three lectures on library usage, with demonstrations on the use of the catalogue.

Professor JOHN F. FULTON (Yale) emphasized the importance of the library in medical school curriculum. Dr. F. A. SONDERVORST (University of Louvain) raised the question of the relative value of central and departmental libraries. He found that students preferred scattered local libraries, each dealing with different branches of study in the various departments of the university. Dr. H. E. MACDERMOT (Editor,

Canadian Medical Association Journal) referred to the Osler library—not a memorial library but Osler's own library—in Montreal. This was of great interest to students and other visitors, to whom it was shown by a man who knew it intimately. Professor J. N. P. DAVIES (Uganda) spoke of the need for creating in the library a pleasant atmosphere, with good lighting, comfortable chairs, and works other than medicine. The library should be open for very long periods, and located conveniently to the medical school.

The Medical Museum

Dr. C. J. HACKETT, Director of the Wellcome Museum of Medical Science in London, spoke of the role of teaching museums in undergraduate education. The contents of such museums should be broadened to include all aspects of medicine. Specimens of pathological conditions, parasites, drugs, and the like, and illustrations and diagrams should be brought together with carefully prepared summaries so that the student might see a disease as a whole, from cause to prevention. He suggested the establishment of a Medical Museums Bureau on a national or international basis for the dissemination of information on museum techniques and for originating and exchanging illustrative material and specimens.

Professor E. F. D'ATH (University of Otago, N.Z.) said that most of the teaching medical museums were in the main pathological museums, having been developed as adjuncts to the teaching of pathology. With the co-operation of other teaching departments the museum could be broadened in scope and made more attractive.

Professor M. MARTINEZ-BAEZ (Mexico), Dr. B. CASTLEMAN (Massachusetts General Hospital, Boston), Professor TOM JONES (University of Illinois), Miss SYLVIA TREADGOLD (Guy's Hospital), and Dr. LEWIS (South Africa) also joined in the discussion.

Teaching the Teacher

Dr. R. D. LAWRENCE (King's College Hospital) said that some attention had been paid in recent years to the question of the selection and training of the teacher, but there had been almost nothing done in this country to ensure that teachers of medicine could teach or to help them if they could not. Teachers of medicine were chosen on account of various qualities and achievements, but not for their teaching ability. Training in teaching did not exist. It was sometimes said that good teachers were born and not made. That was an axiom in which he did not believe. The teacher should have a ready flow of words, a capacity for logical arrangement, and an ability to keep what he taught at the student level. He must also have a character and personality which interested the students, and be able to tease them and laugh with them. Dr. Lawrence referred to the deplorable diction and delivery of many lecturers, and suggested week-end courses for teaching teachers to teach.

In the course of a brief discussion Professor IAN AIRD mentioned an experiment which was being tried out in London whereby it was proposed to give certain men exercises in lecturing and bedside teaching. Dr. F. FREMONT-SMITH (New York) said that the teacher-pupil relationship was analogous to the parent-child relationship, and must be a two-way process of communication. Dr. W. HOWARD HUGHES (United Kingdom) suggested that the schools of the future which produced the finest teachers would be those which had the best extra-curriculum activities, including sport and dramatic societies.

Friday, August 28

The Examination Paper

The final session in Section C began with a discussion on the examination paper.

Professor IAN AIRD (University of London) said that practical examinations in medicine were, to his mind, too short and hurried, and the examination paper might well be used as a sieve or filter to reduce the number of candidates presenting in the practical examinations.

"After having read many thousands of examination papers, I feel competent, not to say whether the writer of the examination paper was a good doctor, but often to say quite confidently, on the result of the written examination alone, that a candidate should not be allowed to practise medicine. If a candidate proved himself in the written examination to be in error on a number of important facts, or not to be provided with a satisfactory number of facts on a given subject, or if he proved to lack understanding of an essential pathological or therapeutic process, that candidate should, on the result of the written examination alone, be rejected, and not present himself for the other parts of the examination. This would allow a longer time than at present available for the practical, oral, and clinical examination of doubtful candidates."

Professor MUNAWAR ALI, President-elect of the Pakistan Medical Association, considered that undue importance was given to the examination paper. The insistence on 50% marks in each component of the examination to avoid failure was unsound in principle. The type of question in vogue at present should be replaced by questions that could be answered on the basis of a general knowledge of medicine gained by the students through their clinical observation and study of patients, not merely on the strength of the cramming of textbooks.

Dr. J. L. TROUPIN (World Health Organization) said that in dealing with his students at examinations he had told them that they were at liberty to bring any textbooks or notebooks they wanted, and to make any inquiries, even over the telephone. The students thought it a jest, but they invariably said that they preferred an examination where they did not have books and could use only what they had learned.

Professor BEATRICE JOLY (University of Ibadan, Nigeria) suggested that the final examination might be regarded as a useful method of evaluating teaching and teaching ability as well as student proficiency. The examination papers in any particular subject should be available to the senior members of the department, by whom they should be assessed very carefully with a view to criticizing the teaching which had contributed to the examination results.

Others who made brief comments were Dr. S. S. MISRA (India), Professor F. AKKRAWI (Bagdad), and Professor M. D. PENAS (Philippines).

Practical and Oral Tests

Professor A. GARRETON-SILVA (University of Chile) discussed methods of testing the degree of knowledge acquired by the student. Some of these methods were of a general character, common to all subjects; others were of a special character. In the preclinical period the criterion of progress was the laboratory work done by the students under the vigilance of the professor and his teaching staff. In the clinical period the best criterion was the care of a patient by the student together with the professor, but here it was essential that the student should share the responsibility for such care.

Dr. R. A. MOORE (Washington University) described a multiple-choice examination which was gaining favour in the United States. This meant putting questions to the students and suggesting a number of answers, one, or perhaps more, of which was correct, and the student was asked to say which in his view was the proper answer. The answers were graded electronically so that no error on the part of the assessor came in. He also described a method of comparing one school with another, taking a mean for all the students.

Why Students Fail

Mr. T. R. HENN, Senior Tutor, St. Catherine's College, Cambridge, in a thoughtful paper, discussed the reasons for student failure. He was inclined to think that any one of more of a number of possible "traumatic" conditions, fostered by the strain of the social and intellectual life of a university, were finally brought to a head, as it were, in a false attitude to the university, to the examination, and the final degree which the examination represented. Those of them who were concerned with the universities could do much to ensure that only intellectually suitable students were admitted, though it was seldom possible to investigate psychiatrically a likely predisposition to a breakdown, nor

would it be advisable to attempt anything of the kind. And who would dare to exclude a potential Shelley or Baudelaire? What conflicts would analysis have revealed in John Donne or Milton? What was possible was to develop in teachers and students a sane attitude to all examinations. Mr. Henn went on to speak of ways in which examinations and the preparation for them could be set in a fairer perspective.

Touching on suicides among university students, Mr. Henn said that the incidence at the older universities in this country was higher than at the younger, probably reflecting the higher standard of entry and of examination, and perhaps the different rhythm of living. Sexual disturbances were not, in his experience, an important cause of failure.

A student, Mr. A. P. OOMEN (Netherlands), said that the relation between medical students and their teachers should not be just the same as that which existed between other students and their teachers—that is to say, that the teachers gave of their wisdom and knowledge and the students just took it in. The making of good doctors was not, in the first instance, a question of absorbing knowledge, but of developing a wiser, better, and more understanding man.

Professor D. E. CAMERON (McGill University) mentioned some of the reasons why students failed. One of the reasons was the development of neurotic or even psychotic difficulties. There was the student who "blew up" in an anxiety state at examinations. What guarantee was there that he would not "blow up" later on at an operation or a delivery? There were students who showed a major change in motivation during the course of their studies, perhaps as a result of marriage and a wife who discouraged them from pursuing a medical career. Again, the woman student had a most confusing role to play. She had to compete with and act like a man, and was often prevented from participating, as her sisters could, in social life. An unusual number of problems arose in the case of the woman student.

The discussion was continued by Professor AKKRAWI (Bagdad), Professor E. ASK-UPMARK (Sweden), and Professor VICTOR SORIANO (Uruguay).

SECTION D: PREVENTIVE AND SOCIAL MEDICINE

Wednesday, August 26

In Section D, under the presidency of Professor A. STAMPAR, the discussion was continued on preventive and social medicine.

The Teaching of Epidemiology

Professor THOMAS FRANCIS (University of Michigan) opened the proceedings with a paper on the teaching of epidemiology. He suggested that epidemiology should be introduced into the curriculum as a study of pathogenesis: ideally, the teaching of epidemiology should permeate all phases of medicine which related to pathogenesis and its applications. Of one thing he was sure, that the more epidemiology was recognized as and believed by the instructors to be an integral part of medicine and medical research rather than some esoteric or merely intellectual activity the greater its effectiveness would be.

Dr. J. WICKSTRÖM (Finland) said that the importance of epidemiology was little acknowledged in practice. At none of the ten medical schools in the Scandinavian countries was there a professorship of epidemiology; lecturers were in charge of the instruction, and one could not expect an adequate competence in education where such a system prevailed.

Professor ROBERT CRUICKSHANK (St. Mary's) said that there were three main avenues along which medicine had made progress—namely, laboratory experiment, clinical signs, and the epidemiological method. Only in recent years had it been realized how applicable the epidemiological method was to a whole variety of diseases. There was the danger of mistaking applied bacteriology for fundamental principles. A great deal was taught about the modern methods which

the laboratory used, but this did not constitute the teaching of epidemiology, which was essentially the pathogenesis of disease in the community. He outlined the teaching of preventive medicine at St. Mary's.

Professor P. BONNEVIE (Copenhagen) said that epidemiology was a part of hygiene, which was concerned chiefly with the environment and the action and attitude of man towards it. Dr. P. S. WOODRUFF (Adelaide) emphasized the importance of the student's participation in epidemiological studies. Professor STAMPAR did not consider that there should be special chairs in epidemiology; the subject should be included in hygiene and social medicine.

Demography and Vital Statistics

Professor AXEL STRØM (Oslo) discussed the teaching of demography and vital statistics. Seminars and colloquies were the methods best suited for teaching these subjects. Lectures were, in his opinion, less valuable.

Dr. PETER PAU (Trinidad) said that he had found an acquaintance with games of chance a useful introduction to statistics in the teaching of students. He had also enjoined his students to study crowds, as at football matches, in order to familiarize themselves with the notion of epidemic disease.

Professor STAMPAR mentioned that as an examiner he had been struck by the fact that many students were quite unable to state the population of their own town or county or the birth and death rates.

Teaching of Medical Genetics

Dr. J. A. FRASER ROBERTS (Stoke Park Colony, Bristol) contributed a paper on the teaching of medical genetics, a knowledge of which, he said, was of practical importance in learning and practising medicine. Instruction should not be postponed to postgraduate courses, and the genetics taught in connexion with biology should be supplemented by teaching on medical genetics during the clinical years. Five or six systematic lectures should suffice.

Dr. M. POUMAILLOUX (Paris) read a short contribution to the discussion sent by Professor M. LAMY, of Paris. In France, in the introductory year, during which the natural sciences were taken, twenty lectures were devoted to animal genetics, but until the recent establishment of a chair in medical genetics at Paris (of which Professor Lamy is the holder) there was no teaching in genetics from the human point of view.

Dr. J. B. JEPSON (Middlesex Hospital) emphasized the contribution which the course in chemistry given in medical schools should make to the teaching of medical genetics and of social medicine. The occurrence and importance of variation, genetical and otherwise, could be readily demonstrated as part of the course in chemistry and biochemistry, and it was here, in the first instance, that it should be emphasized as an important factor in clinical and social medicine.

Thursday, August 27

Social Psychiatry

The proceedings on Thursday began with a paper by Professor H. C. RUMKE (University of Utrecht) on the teaching of social psychiatry. Such teaching, he said, should be part of the whole teaching of medicine. Social psychiatry was not a matter only for the student who intended to be a psychiatrist or a specialist in mental health, but also for those who wished to be general practitioners. The more the general practitioner knew about social psychiatry the higher his standing would be. The speaker gave a survey of the teaching of the subject in his own university.

Dr. J. L. HALLIDAY (Department of Health for Scotland) said that there was widespread failure to appreciate the psychology of and social approach to sickness, and to understand what action of a therapeutic or preventive kind such an approach indicated. When the enormous mass of recurrent illness and chronic invalidism was realized it was evident that psycho-social medicine—a term he preferred to

"social psychiatry," which was too exclusive—needed to be incorporated in the curriculum.

Dr. PETER PAU (Trinidad) described some of the difficulties of social medicine in the West Indies, the tracing of family patterns, and the ascertainment of taboos. Professor W. G. SMILLIE (Cornell University) mentioned the useful findings obtainable through the students' health service. Illness among students was often the result of emotional stress. By enabling the student to understand himself and his fellow students he was the better equipped to understand his future patients. Dr. R. SUTHERLAND (Leeds) said that it was often difficult to elicit the underlying tensions in an interview with the patient, and here he had found a use for the tape recorder.

Social Environment and Individual Illness

Professor A. QUERIDO (University of Amsterdam) said that, notwithstanding the development of technical methods and the attention these received in teaching, the individual patient with his complaints and symptoms was the pivot of all true clinical instruction in the art and science of medicine. How could the social factors which had contributed to the illness of a patient be assessed in clinical teaching? And how could the social factors which might assist the patient's recovery be properly evaluated? It was a problem of integrating social data in the same way as the data resulting from x-ray or pathological investigation were integrated. But what specialist was to do this integration? Was the social worker or almoner comparable with the radiologist or pathologist? He was doubtful whether the social worker could bring the teaching up to the standards of medical education.

Professor YOSHIO KUSAMA (Keio Gijuku University, Tokyo) said that when his department in his school of medicine was organized in 1928 it was called "preventive medicine." To-day it was called "hygiene and public health." The public health discipline for undergraduate medical students in his country was not markedly different from what it was in others.

Home Setting in Medical Education

Dr. J. M. FAULKNER (Boston University School of Medicine) described a programme devised at his university which brought students into direct participation in the care of patients in their homes. The programme was organized as the home medical service, which was a division of the Department of Preventive Medicine. This service was an extension of the out-patient department of the Massachusetts Memorial Hospital. It provided medical care in the home for the indigent in a circumscribed area of Boston immediately surrounding the hospital; this was a slum district, with a population of about 50,000. Fourth-year students were assigned to the service, full time, for one month. In addition each third-year student was assigned a patient from the service whom he followed for two years. About 15,000 visits were made annually to about 5,000 patients, 85% of whom were treated at home.

Professor MARCEL GRAFFAR (University of Brussels) said that at the end of the war his university decided to set up a chair of social medicine as distinct from the chair of hygiene. Of this chair the late Professor Sand had been the first titular holder. The co-existence of the two chairs had been entirely successful, and each professor had co-operated with the other. Professor Sand had realized the need for complementing theoretical instruction by practical exercises, and since 1947 the students in their penultimate year had been sent out into the field to study social problems and to make routine reports on their observations.

Among others who took part in this discussion were Dr. JOHN PEMBERTON (University of Sheffield), Dr. E. M. DIMOCK (University College Hospital), Dr. K. NELSON (Richmond, Virginia), Dr. JULES P. DE MELLO (Nairobi), and Dr. DAG KNUTSON (Stockholm).

Professor STAMPAR said that in Zagreb the students were expected to go out in groups to the villages.

Teaching of Occupational Health

Professor A. J. LANZA (Department of Industrial Medicine, New York University Postgraduate Medical School) mentioned the difficulties which had attended efforts to introduce industrial medicine into the undergraduate curriculum. It might well be that before this was achieved the scheme of medical school education would have to be reshaped. In the meantime they kept on trying to establish their "beachhead" in the third or fourth year classes.

Dr. RICHARD SCHILLING (Nuffield Department of Occupational Health, University of Manchester) pleaded for the integration of all the specialties bearing on this subject. One of the great factors encountered in occupational health was the unwillingness of many workers to place themselves under medical care owing to their fear of being deprived of their employment. The teaching of occupational health should be an integral part, with social medicine, of all clinical teaching, and was most effectively given by clinicians.

Professor P. BONNEVIE (University of Copenhagen), Professor THOMAS FRANCIS (University of Michigan), Dr. J. J. GILLON (Medical Inspector-General of Industry in France), and the Chairman (Professor STAMPAR) took part in the discussion.

Student Health Services

Sir ALAN ROOK, senior health officer, Cambridge University, suggested some ways in which use could be made of the student health service for giving practical tuition. One way would be for the instruction of medical students in immunological procedures. Mantoux testing and B.C.G. vaccination of the students themselves, at present done by student health officers, could be used for teaching. He indicated various other ways in which the student health service could be used for the dissemination of knowledge of social and personal hygiene.

Dr. P. S. WOODRUFF described the student health services in Adelaide, and Dr. PETER PAU (Trinidad) those obtaining in the West Indies.

Infant and Child Care

Dr. MARIJ AVCIN (Yugoslavia) opened a brief debate on infant and child care as a medico-social problem.

Professor JOHN CRAIG (University of Aberdeen) said that both the teaching of social medicine and researches into social conditions were becoming more difficult because the more obvious environmental diseases in this country occurred less often. But many questions remained without an answer.

Every student should spend at least a month with a family doctor on his rounds, getting some insight into conditions in the homes of the people. Ward and out-patient work, visits to families in their homes, attendance at child welfare and aftercare clinics, were all useful teaching agencies for medico-social knowledge. Most helpful of all was the teacher himself. Each teacher should strive, therefore, to know his own region intimately, its history and geography, its climate and diseases, its culture and its social problems.

Dr. ROBERT SUTHERLAND said that health education should start with paediatrics, and Dr. MCLENNAN quoted the advice of a paediatric teacher to his students: "Never believe a word the mother says."

Friday, August 28

The Teaching of Nutrition

The first address in the closing session of the Section was by Dr. H. M. SINCLAIR (Oxford) on the teaching of nutrition. The emphasis on nutrition in the preservation of health, he said, was by no means new—witness the teaching in the school of Salerno in the twelfth century. The best method of stimulating an interest in nutrition was probably not by postgraduate study but by a year's research at the

end of the training in physiology and biochemistry. This period of research had proved very valuable at Oxford, where the degree of B.Sc. was available for it.

Mr. HARRY LILLIE (Scotland), Dr. PETER PAU (Trinidad), Dr. DAG KNUTSON (Stockholm), and Dr. ROBERT SUTHERLAND also took part in the discussion.

Housing in Relation to Health

The Section then turned to the housing question, on which there was a paper by Professor J. M. MACKINTOSH (London School of Hygiene and Tropical Medicine). Instruction to the medical student concerning housing should be given in such a way as to stir the student's interest and imagination, and should be related to health and sickness. The primary aim in teaching undergraduates about housing conditions should be to illustrate by example the ill effects, both mental and physical, of bad housing. The best approach was the historical one: the student should be shown by illustration and subsequent visiting what slums were and how they had grown and the methods by which they could be eliminated. The discussion took the form of statements about housing conditions in several countries, particularly in the East.

Integration of Preventive and Social Medicine

The final paper was on the integration of the teaching of social medicine and preventive medicine in the curriculum. Professor J. P. HUBBARD (University of Pennsylvania) said that social medicine was not a separate discipline with a discrete body of knowledge; rather it was an attitude which permeated the entire medical curriculum. It was founded in the basic sciences and in clinical medicine; it drew also upon the social sciences, and in its application called for a health team which included not only the practising physician and the health officer but also the visiting nurse, the social worker, and many others with specialized skills.

Professor STAMPAR, from the chair of the Section, in closing the proceedings, said that he himself had learned a great deal from the many original contributions which had been given, and it was evident that social and preventive medicine was gaining ground in the education of the medical student.

CONCLUDING PLENARY SESSION AND CLOSING PROCEEDINGS

After the four Sections had finished their work the Conference assembled in plenary session on Friday afternoon and Saturday morning, August 28 and 29. Sir LIONEL WHITBY, the Conference President, was in the chair during Friday afternoon, and Professor W. MELVILLE ARNOTT, the Deputy President, presided on Saturday, when Sir Lionel Whitby had to leave for Canada. At these concluding sessions the four Sectional vice-presidents, Dr. Victor Johnson, Sir A. L. Mudaliar, Professor A. Hurtado, and Professor A. Stampar, addressed the Conference, and they were followed by the rapporteurs, Dr. Raymond Whitehead (Section A), Dr. A. Morgan Jones (Section B), Professor Ian Aird (Section C), and Dr. Charles Fletcher (Section D). Each rapporteur summarized the work of his Section and there was then a general discussion on it. Some comment on the remarks of the vice-presidents and rapporteurs is given in a leading article at p. 549, but a full report of their speeches will be given in next week's *Journal*.

During this session the President referred to the death of Dr. René Sand, who was to have presided over Section D, and the Conference stood for a few moments in silent tribute. An obituary notice is printed at p. 571.

Closing Proceedings

On the last day of the Conference, after the final discussion, Professor Melville Arnott said from the chair that there was no doubt whatsoever that the Conference had been very well worth while. He was quite sure that nobody was happy or complacent about medical education, and the

Conference had caused—and would continue to cause—much earnest thinking. But he hoped it would be remembered that plans could never triumph over individuals, and that they would not be hypnotized into too much planning.

Dr. T. C. ROUTLEY, chairman of the Organizing Committee, said that Dr. E. Grey Turner, the indefatigable secretary of the Local Arrangements Committee, had informed him that the entire proceedings had been recorded on 200,000 feet of magnetic wire. But the really permanent record would be in the minds of those who had attended. It was just three years ago that Dr. Hugh Clegg brought forward the idea of this World Conference. The idea "took legs," but the "legs" had new roads to traverse and no road maps to guide them. The result, however, had more than justified the labours entailed. He acknowledged with the sincerest appreciation all who had assisted—the World Health Organization, and the collaborating bodies, the Council for International Organizations of the Medical Sciences and the International Association of Universities; the industrial corporations who had made substantial gifts; the authors of the papers; the interpreters who had rendered excellent service; the Society of Friends, in whose house most of the meetings had been held; the host organization, the British Medical Association and its officers and employees, who had given the most unselfish service; the officers of the Conference, its vice-presidents and rapporteurs, and those who had entertained the members at a succession of social events. He also expressed gratitude for the service, continuing through the years and emphasized in the present Conference, of the secretary-general, Dr. Louis Bauer, and his executive assistant, Miss M. L. Natwick, and finally for the work of Dr. Hugh Clegg, secretary of the Programme Committee, who would continue to labour in the preparation of the published proceedings.

The meeting by prolonged applause endorsed Dr. Routley's remarks, and the Conference then terminated.

SOCIAL OCCASIONS

As host organization to the First World Conference on Medical Education the British Medical Association led off the round of receptions and visits with a reception at B.M.A. House on August 22. The Great Hall was filled with a gathering of delegates from all over the world, many of them accompanied by their wives and families. The guests, who numbered nearly 500, were received by the President of the B.M.A., Mr. J. W. Tudor Thomas, and Mrs. Tudor Thomas, and by the Chairman of Council, Dr. E. A. Gregg, and Miss M. Gregg. On Sunday, August 23, there was an excursion to Cambridge, where the visitors had lunch in Trinity College and tea at Downing, where Sir Lionel and Lady Whitby were the hosts. During the week the Conference was in session receptions were given by the Government, the Royal Society of Medicine, the University of London, the London County Council, and the Ciba Foundation. There was also a sherry party at B.M.A. House given by the Medical Women's Federation to medical women from overseas. On the afternoon of August 25, when the delegates had a half-holiday, there was a river trip down the Thames to Greenwich. At the Conference Banquet on August 28, held at the Dorchester Hotel, Sir Lionel Whitby was in the chair. Sir A. L. Mudaliar gave the toast to the World Medical Association, and this was seconded by Dr. M. Poumailloux. The response was made by the secretary-general, Dr. Louis H. Bauer, who said that he believed the doctors of the world had done more to improve international relations than all the diplomats put together. Dr. Dag Knutson proposed the health of the guests, and Miss P. Hornsby Smith, Parliamentary Secretary to the Ministry of Health, replied. In congratulating the organizers she said that few conferences had commanded the substantial and responsible editorial comment which the First World Conference of Medical Education had achieved. Professor A. Hurtado proposed the toast to the president, and Sir Lionel Whitby made a brief response.

AIDS FOR THE DISABLED

[BY A SPECIAL CORRESPONDENT]

Among the attractions at the first International Congress of the World Confederation for Physical Therapy, which opens at the Central Hall, Westminster, on September 7, is an exhibition of self-help devices, splints, and gadgets for the disabled. The exhibition remains open until September



FIG. 1

widely known, deserve special notice as they are so useful, so simple, and so highly valued by the patients who need them.

The American Physical Therapy Association is exhibiting a collection of aids selected from the many which have been developed in the United States. They include devices to help various types of cripple with the activities of daily living, such as dressing and undressing, toilet, eating, communication, getting about the house, and doing housework. A gadget seems to have been devised to overcome every rehabilitation obstacle.



FIG. 2

12, and it should prove of great practical value to anyone responsible for the care of disabled persons. The exhibits have come from the United States, Canada, and South Africa, as well as from many parts of Britain. It is possible to describe only a few of them here.

The British Red Cross is showing several gadgets and adaptations for the home-bound cripple. The padded eating utensils and the long-handled toilet aids (Fig. 1), although already

There are several exhibits from the Canadian Physiotherapy Association. From the Physiotherapy Department of Ottawa Civic Hospital there is a detailed description of an adaptable bed which can be tilted to 85° by a jacking system to allow a patient to put his feet to the ground and stand up without effort. The bed appears to be sturdy and easily constructed. Other exhibits are splints adapted to take attachments when there is complete loss of control of wrist and hand and an adjustable chair for cerebral palsy patients. Another chair shown by the Canadian Physiotherapy Association is most ingenious (Fig. 2). It consists of a framework on wheels with two overhead bars whose height can be raised on a ratchet. The patient is wheeled underneath the bars, from which shoulder straps are attached to large comfortable axillary pads. The patient is then wound up to standing height, in which position walking re-education can be begun, with no fear of falling.

From the Royal Victoria Infirmary, Newcastle-upon-Tyne, there is a simple device for the retraining of plantar flexion in cases of fractured calcaneus. There are some examples of Mr. Norman Capener's (Exeter) "lively" splints. Each splint is made to suit the individual problem. Its object is to allow both physiological rest and an appropriate amount of function. There is no doubt that similar

splints could be more widely used. The Central Council for the Care of Cripples is showing gadgets to assist crippled housewives do their housework and manage their kitchens. Mr. H. A. Turnbull, M.C.S.P., has sent details of a crutch attachment (Fig. 3) for use by a patient who needs a crutch but cannot control one because of insufficient grip in the hand. This should prove useful in the right case.

Other exhibitors include the World Veterans Association, the Chartered Society of Physiotherapists, and the Association of Occupational Therapists, as well as departments of physical medicine and individual doctors and physiotherapists.

The exhibition demonstrates very clearly how self-help devices have developed along similar lines in different countries and at different centres. On the other side of the Atlantic there seems to be a tendency to encourage the use of aids at an earlier stage than in Britain; perhaps economic pressure demands this. At all events the Americans certainly lead in this field, especially where a complicated gadget is needed.

It may be hoped that the exhibition will stimulate the production of a comprehensive catalogue of self-help devices. This is badly needed, as at present information about them is widely scattered and certainly not easily available to the general practitioner.



FIG. 3

Correspondence

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

Vitamin A in Bread

SIR,—Without wishing to involve you or myself in a discussion on the relative merits of "white" (that is, low extraction) and "brown" (that is, high extraction) bread, I venture to ask you not to perpetuate the long since disproved error that wheat flour contains any vitamin A. You do this in the annotation under the above heading (*Journal*, August 15, p. 385) when you say that "the processing of white flour" removes "practically all the vitamin A." Anyhow, it would be carotene in one or other of its biologically active forms, and not vitamin A, that would be present in purely vegetable material, but it was shown by Zechmeister and Cholnoky¹ more than twelve years ago that none of the carotenoids in wheat was identical with any of those known to have biological (vitamin A) activity, of which much the most important is β -carotene.

The carotenoids in vegetable and animal tissues are closely associated with, or actually dissolved in, the fatty material present; in wheat this is, for all practical purposes, confined to the germ and is the wheat-germ oil. The carotenoids of this oil were submitted by Zechmeister and Cholnoky to careful chromatographic fractionation and found to contain practically nothing but xanthophyll, which is devoid of all vitamin A action.

Readers who wish to check my authority for these statements can do so in any standard book on the carotenoids, such as that by Karrer and Jucker, translated by Braude.² They will find that these authors give the natural sources of different carotenoids. The sources given for α -carotene, β -carotene, γ -carotene, and cryptoxanthin, the only four biologically active carotenoids of importance, do not include wheat.

You, Sir, will, I am sure, support me in the view that it is especially wise to have one's facts right when discussing matters, such as the colour of bread, that seem to arouse irrelevant emotions.—I am, etc.,

Greenford, Middlesex.

A. L. BACHARACH.

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- ² *Carotenoids*, 1950, Cleaver-Horne Press, London.

Gas Flows in Anaesthesia

SIR,—The article by Drs. G. Herington and E. James (*Journal*, August 8, p. 317) brings me to the point of making the following observations which, though they can scarcely be original, I have not yet seen anywhere in print.

It is common to read the statement in anaesthetic literature that anaesthesia was maintained with nitrous oxide-oxygen in the ratio 2:1 or 3:1, but generally no mention is made of the rates of flow of the gases. One assumes that the patient is intended to breathe a 3:1 mixture from the reservoir bag, but probably it was in fact the readings of the nitrous oxide and oxygen flowmeters which were in the ratio of 3:1, and this is not by any means the same thing. The larger the gas flows the closer does the ratio of the percentages of the gases in the bag approach that of the flowmeter readings. But with small flows, as used in closed-circuit-with-a-leak systems, this may be far from being so, because oxygen is metabolized at a variable rate and disappears from the system into the soda lime canister as carbon dioxide, whereas nitrous oxide, being inert, circulates continuously once equilibrium has been attained.

Now in the case in point nitrous oxide-oxygen anaesthesia was continued when "saturation with nitrous oxide was considered adequate . . . with 1 l. of nitrous oxide to approximately 300 ml. of oxygen . . .", which is a ratio of approxi-

mately 3:1. Assuming in this case a basal oxygen consumption of 200 ml./min., and equilibrium to be complete, the bag mixture would settle at 1,000/(300-200) or 10/1=9.1% O₂. Were the basal oxygen utilization only 50 ml. greater the ratio becomes 20/1=<5% O₂. To obtain an oxygen percentage equal to that of air requires either that the oxygen flow must be raised to 450 ml./min. (in this case), or that nitrous oxide be retained by the patient at the rate of 600 ml./min., which will only occur in the initial period of the anaesthesia. Doubling the flow rates to 2 l./min. and 600 ml./min. respectively, while leaving the ratio of flowmeter readings unchanged, raises the oxygen content of the bag mixture from 9.1% to 16.8%.

In practice, of course, one can only guess the oxygen consumption of a patient on the table. Thus it seems to me that in all cases it is important to note the actual rates of flow of the gases rather than the percentage of gases that the anaesthetist intended to administer.—I am, etc.,

Pewsey, Wilts.

J. C. AINLEY-WALKER.

The Pain of Transurethral Manipulations

SIR,—I agree with your correspondent Dr. E. C. Atkinson (*Journal*, August 22, p. 440) that transurethral manipulations are extremely painful and distressing without adequate anaesthesia. Many years ago I came to the conclusion that in the male procaine and cinchocaine were very inadequate, and consequently whenever possible I used a general anaesthetic or a low spinal.

However, this has been changed by the introduction of lignocaine hydrochloride ("xylocaine"). A 2% solution kept in the urethra for 15 minutes gives a very satisfactory degree of anaesthesia. I now find it necessary to use a general anaesthetic only when I am treating by diathermy a growth or dealing with a nervous patient.—I am, etc.,

Ballygally, Co. Antrim.

H. CALVERT DALES.

Generalized Actinomycosis with Possible Cardiac Involvement

SIR,—We thank Dr. Kevin Anderson (*Journal*, August 8, p. 340) for pointing out that *Actinomyces bovis* does not form spores. Nor, may we add, does it grow aerobically in normal methods of blood culture—that is why the spore-bearer grown aerobically was rejected.

We regret that our final generalization was argued to the particular, although we maintain that the principle put forward in our final paragraph still holds good.—We are, etc.,

RONALD S. SAVIDGE.

DONALD M. DAVIES.

Bury.

Appendix in the Hernial Sac

SIR,—I should like to submit the following details of an uncommon case.

A healthy labourer, aged 62, was admitted to hospital on July 14, 1953, complaining of a large tender lump in his right groin. He had had bilateral herniae for 20 years controlled by an adder-headed truss. Some months previous to his admission he noticed the right side swell and "come down" but he did not bother to do anything about it in the way of medical treatment. Three days prior to admission he felt pain and tenderness which made him stop work and go to his doctor. On examination a lump 4½ by 3 in. (11 by 7.5 cm.) was found in the right groin in the position of the external ring. The skin over it was reddened and warm. The swelling was firm and it was impossible to get above it; there was an impulse on coughing and it was irreducible; it did not extend into the scrotum. The left external ring was weak and there was a cough impulse, but no visible lump. Bowel habits were normal and at no time had there been vomiting or abdominal pain.

The case was diagnosed as an irreducible right-sided hernia, probably omentocoele and non-obstructed. At operation there was a large hernial sac which contained a gangrenous, grey-green coloured appendix, 7 in. (17.5 cm.) long. It was hard and contained several faecoliths. It was traced as far as the caecum, which was lying in the neck of the sac, and there ligated and excised in the routine manner. The sac was also ligated

and excised, but no formal repair was carried out in view of the infected contents. The subsequent convalescence of the patient was uneventful and he was discharged home on July 28.

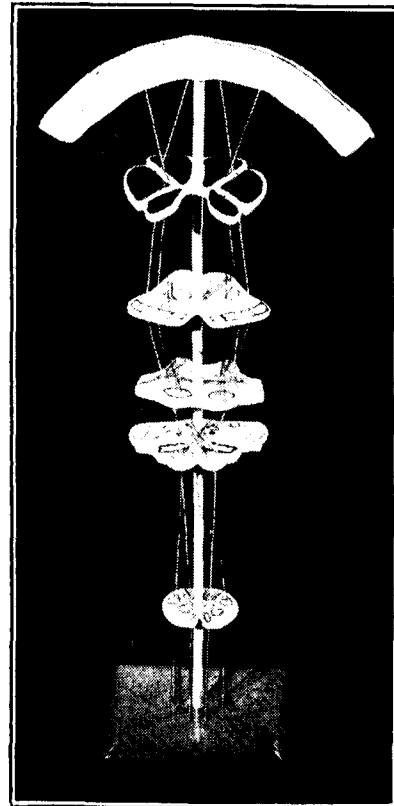
I have questioned several people, and, while they assure me they have heard of the occurrence, none can say they have seen such a case at operation. It would be interesting to know the frequency of the condition. I am grateful to Mr. J. A. O'Connell for his permission to publish the facts of the case and his help in the drafting of this letter.—I am, etc.,

Mullingar, Eire.

T. E. WINCKWORTH.

A Visual Aid

SIR,—When I first studied neuro-anatomy as an undergraduate I found that I had become acquainted with various cross-sections of the brain and brainstem—but I had difficulty in visualizing these sections in relation to one another and especially in relation to the nervous tracts.



The photograph shows a model I have made which illustrates the pyramidal system in an attempt to clarify the formation of the internal capsule and the subsequent distribution of its crossed and uncrossed fibres. In this way, for example, it becomes more or less straightforward to show why the fibres from the lower part of the motor area must occupy the anterior position in the genu and thereafter lie medial to the remainder of the pyramidal tract in the midbrain. I feel that once the elementary conception of the inter-

relationship of the structures is grasped it becomes easier to know what one is looking for in the dissecting-room, and I venture to suggest that such a model would have cleared up many of the initial difficulties I encountered. Comments on its teaching value would be welcomed.

This model, in which coloured threads distinguish the various subdivisions of the pyramidal tract, was made with the help of my orderly, Bdr. J. Shaw, to whom my thanks are due.—I am, etc.,

Newcastle-upon-Tyne.

J. G. COLLEE.

Spectacles

SIR,—I read with great interest Mr. J. H. Doggart's able review on spectacles (*Journal*, August 15, p. 388). I had feared that the art of spectacle prescribing was being relegated to the status of a merely technical accomplishment, and I derived much satisfaction from so authoritative a declaration that it is not so, and that it involves definite clinical, as well as technical, considerations. This needed saying, and Mr. Doggart is to be congratulated for saying it.

At the same time I think he may have gone too far in the direction of deprecating current views on the value of an eye examination in certain conditions, particularly head-

aches. It may be true to say that most headaches are not due to eye trouble, but I think it is a pity to suggest that many examinations for the exclusion of refractive errors are superfluous. The headache, it is true, may not be due to a refractive error, but it may be due to some other cause either of ocular origin or of some other origin showing ocular signs. I suggest that an examination of the eyes is an essential part of any thorough investigation into a case of headache of unknown origin. Also, I should like to suggest that the wearing of glasses gives relief from headaches in a great many patients whose headache is neither of refractive nor of heterophoric origin. Many such patients show signs of, or give a history of, conjunctival hyperaemia. This is aggravated by prolonged fixation, whether in driving, reading, or televising, and results in headache. Why glasses should give relief in such cases I do not know, but I have no doubt that they do, and I do not think that in most cases the relief is of psychological origin.

With regard to migraine, whilst I agree that it is not of refractive nor even of ocular origin, the diagnosis of the condition is not always a simple matter, so protean in its manifestations is it, and I think it is useful to have an ophthalmic examination in doubtful cases.—I am, etc.,

London, W.1.

R. U. GILLAN.

SIR,—It is a pity that Mr. J. H. Doggart in his admirable exposition of the orthodox principles for prescribing spectacles (*Journal*, August 15, p. 388) has overstressed the dogma that headaches of ocular origin are uncommon and implied that only large refractive errors or those causing obvious symptoms need correction. This is unfortunate for two reasons: first, because it may hinder the recognition of some headaches which are easily relieved, and, secondly, because it weakens the true case against prescribing unnecessary spectacles. The suggestion that because large refractive errors often cause no discomfort small ones may not do so is misleading. Small errors probably cause more headaches than large ones, and a few people are acutely sensitive to visual imperfection although many are tolerant or indifferent to it.

As Mr. Doggart says, the history will usually supply a clue, but not if inquiry is limited to the effects of long spells of close work. There are two main sources of ocular fatigue—prolonged concentration and flickering lights. Watching the cinema, particularly a colour film, may give a useful guide to the effect of the latter. Ocular discomfort from the glitter of moving objects may be severe enough to provoke nausea and is responsible for one form of travel sickness. From my own experience I can aver that fishing rippling water on a bright day is a potent cause of headache, and had I realized this 25 years ago I could have avoided a grievous end to many an enjoyable day.

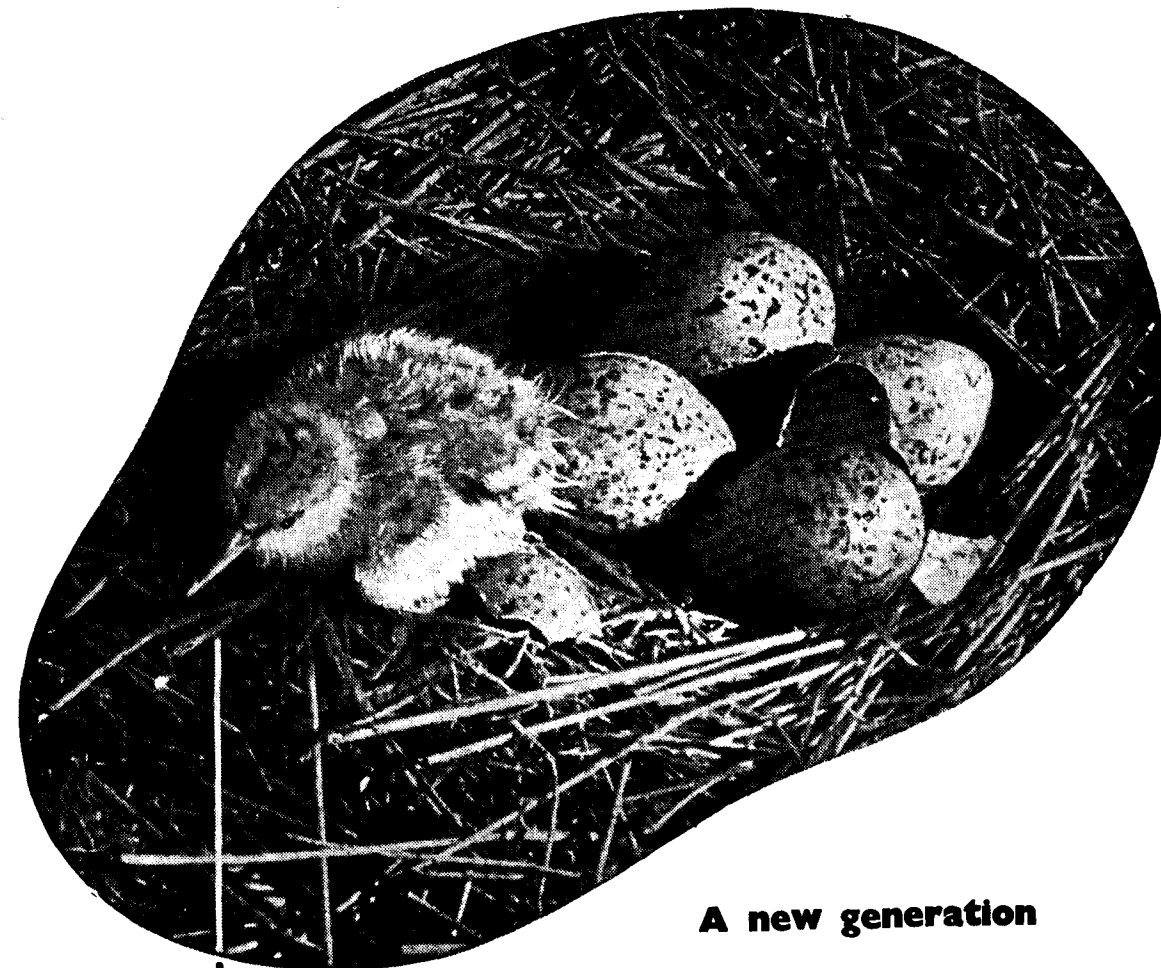
The question of migraine is more difficult. Headaches of ocular origin, especially those associated with ocular muscle imbalance, may cause vomiting and may thus improperly be labelled migraine. Their relief by spectacles has probably fostered the belief in the association of migraine with refractive errors. Of course, as Mr. Doggart says, migraine is not due to refractive errors—its fundamental cause is still unknown—but attacks may be provoked in those who are subject to it by many diverse stimuli, and it appears that, just as some are engendered by emotion, a few may follow ocular fatigue. It seems reasonable, therefore, to investigate this possibility when the history may suggest it.—I am, etc.,

Redruth.

CHRISTOPHER HEATH.

Manual Methods in General Practice

SIR,—I would be grateful for the space in which to correct Dr. R. Barbor's misquotation (*Journal*, August 15, p. 395) from my letter (*Journal*, July 25, p. 222). Dr. Barbor writes that he cannot agree with my statement that "the proportion of total patients seen who require physiotherapy is 5%." That is not my statement. My actual words were:



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"Only 5% of the total number (of patients) seen in that time were suffering from 'soft-tissue lesions.'" Of course I saw patients who required physiotherapy for arthritis of various joints, but these were not "soft-tissue lesions," while the physiotherapy they required consisted of methods of treatment other than "manual methods," which was the subject under discussion.

The relatively small number of patients I diagnosed as suffering from prolapsed intervertebral disk were suffering from prolapsed intervertebral disk, and the fact that they required to be seen and treated by a consultant orthopaedic surgeon confirms the severity of their condition. As I endeavoured to show in my letter, not all who have back-ache are suffering from prolapsed intervertebral disk.—I am, etc.,

London, N.W.3.

PHILIP HOPKINS.

The Intervertebral Disk

SIR,—Disk injuries, and arthritis of the apophyseal joints, are part of the penalty man pays for his temerity in assuming an erect, plantigrade posture. Treatment should be based on this ontological conception: the child crawls before it walks. My routine of treatment, employed many years before the disk lesion was described, is: (a) three or four days in bed, with a firm pillow tied to the small of the back; (b) two weeks' hands-and-knees crawling for some 3 to 10 minutes three times a day; (c) two further weeks of hands-and-feet crawling, to strengthen further the erector muscles. With this technique manipulation is rarely required, the patient effecting the reduction himself by active movement. I usually give two or three paravertebral injections of lactic acid, with or without procaine, in the acute phases. Not infrequently, the relief of pain is dramatic, but I am somewhat sceptical of the Pauline conversion, as the patient is apt to give up the exercise too soon.

A few precautions may be mentioned. The knees should be padded and gloves worn. If postural scoliosis is present, crawling is done in a circle, away from the convexity. Outside the home the door should be locked: one patient circling his desk in this undignified attitude was surprised by his secretary—with disturbing consequences.

There is of course nothing original in this treatment, which is merely the adaptation of Klapp's exercises for lesser degrees of scoliosis. If it fails, the ruptured disk is almost certainly irreducible, and laminectomy is called for.—I am, etc.,

Sunderland.

W. GRANT WAUGH.

Blood Transfusion Accidents

SIR,—I regret that the Consulting Pathologists Group Committee has prevailed on you to publish a "statement" (Journal, August 15, p. 390) on blood transfusion accidents. It is an anonymous statement, not even "approved" or "agreed" by the Group, and its authority is therefore nil—because the authority with which any "statement" is invested depends on the wisdom and experience of its authors. Unfortunately, non-medical readers are apt to assume that the wisdom of a medical committee is the sum of the wisdom of its members—whereas we know that their collective wisdom is rarely greater than their highest common factor.

In fact, the statement is inaccurate in some technical matters. Cross-matching in saline and albumin does not exclude incompatibility, because the antibody anti-Duffy fails to agglutinate Duffy-positive cells in saline or albumin, but can be detected only by the anti-globulin technique, which is not even mentioned in the statement. There is still some argument about the relative reliability of tile and tube methods for ABO grouping,^{1,2} and it seems reasonably certain that the capillary method of Rhesus testing is not less reliable than is the tube method.^{2,3}

Transfusion is intended to save lives, and in some hospitals transfusion is sometimes needed within 30 or 45 minutes, even now when dextran is freely used. I believe that there may be more than one technique which is reasonably safe in skilled hands, and I have the strongest objection

to being told by some anonymous pundit that this is not true, the more especially when the pundit himself makes erroneous statements.

It is now generally accepted that most transfusion accidents are caused by bad organization, carelessness, or ignorance. The Group Committee might find it more profitable to represent to the Ministry, to regional boards, and to boards of governors that in no hospital should grouping and cross-matching be done in the ward sideroom by a house officer, but that in every hospital the organization of transfusion must be the responsibility of a consultant pathologist who has time, space, and staff to supervise the work properly.—I am, etc.,

London, N.W.10.

GEORGE DISCOMBE.

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Heparin in Intravenous Infusion

SIR,—It is well known that difficulty is often experienced in maintaining a continuous intravenous infusion over a prolonged period owing to the onset of local thrombophlebitis, but it is much less well known how useful heparin can be in minimizing this complication. For several years I have used heparin with considerable success for this purpose. It may either be injected with a syringe into the flasks immediately before use or, alternatively, the flasks may be prepared in advance by the pharmacy department. A dosage of 1½ to 2 units per ml. of intravenous fluid is recommended. Using heparin in a strength of 1,000 units per ml., 0.75 to 1 ml. should therefore be added to each half-litre flask. If a stronger solution is used—for example, 5,000 units per ml.—the volume required for each flask is so small that it is difficult to measure accurately. Furthermore, it must be suitable for intravenous use. The risk of haemorrhage is not increased, because the heparin, administered in small amount and at a constant rate, has sufficient concentration only to act on the vein proximal to the needle or cannula. When it enters the general circulation it is too dilute to have any effect on the clotting time and is soon eliminated. It is safe to give heparin in this way shortly after, or even during, operation provided that the infusion has not to be run quickly. Should this become necessary, then the flask must be changed to one without heparin.

By this safe and simple method, time, painful thrombosis, and the consequent loss of a patent vein can be avoided. It is worthy of wider application.—I am, etc.,

Manchester.

H. F. SMITH.

Familial Hypertrophic Pyloric Stenosis

SIR,—It was with great interest that I read the article by Mr. T. Fenwick on familial hypertrophic pyloric stenosis (Journal, July 4, p. 12). I recently had a similar case, though without an extensive family history. Perhaps it is worth recording briefly as another example of the type of association Mr. Fenwick has described.

The patient, a male aged 54, presented with an eight-year history of periodic lower sternal and epigastric pain, leading to nausea, and associated with acid regurgitation and vomiting. Recently there was loss of appetite and loss of weight. Radiologically he was diagnosed at two examinations as having a prepyloric ulcer with the possibility of malignancy. Exploration was advised. At operation there was a greatly hypertrophied pylorus which was thought at the time to be a tumour. A Billroth I type of gastrectomy was performed. The patient's subsequent convalescence was normal. Pathological examination revealed that the tumour showed a rather thin mucous membrane which was rather engorged and with more polymorphonuclear infiltration than normal, but no actual ulceration. The main abnormality, microscopically as well as macroscopically, was in the markedly increased thickness of the pyloric musculature. The individual muscle fibres themselves were abnormal, in that they were swollen and stained irregularly, giving the impression of being broken when viewed lengthwise, and of a ring shape when cut across. There also appeared to be marked separation by fluid of the individual fibres. No evidence of malignancy was seen. The conclusion was that it was pyloric hypertrophy.

When I discussed the findings with the patient and explained to him that the trouble had not been an ulcer but an enlarged muscle at the exit of the stomach causing obstruction, he said that his eldest child, a boy, had been rushed off at the age of 4 months to hospital and had had an operation for a similar condition. This has kindly been confirmed for me by the hospital concerned, which reports that the baby had a Ramstedt operation for pyloric stenosis at the age of 15 weeks.—I am, etc.,

Bath.

S. GLASER.

Reduction of Post-operative Pain

SIR,—I read with interest the annotation (*Journal*, August 15, p. 385) concerning methods of relieving post-operative pain. Reference was made to the use of the drug "efocaine." It is true that this drug gives much longer anaesthesia than most of the other anaesthetics at our disposal, but it certainly has dangers and disadvantages. Three cases have been reported from America, where, following the use of efocaine, serious neurological symptoms developed and persisted, and it is understood that other permanent palsies have been encountered. In these cases intercostal injections have been made in the paravertebral region.

My registrars and I are at present investigating a small series of gastrectomies where the efocaine was injected in the region of the intercostal nerves in the mid-axillary line. In many of these cases the anaesthesia was very prolonged and has given considerable discomfort to the patient. We hope to publish a short account of these cases in the near future.—I am, etc.,

Liverpool, 1.

J. B. OLDHAM.

Sun on the Skin

SIR,—In your annotation (*Journal*, August 8, p. 330) you mention that, although it is not easy to increase tolerance to light by systemic treatment, mepacrine by mouth delays the onset of erythema from ultra-violet light. No mention is made of nicotinic acid, which has quite a marked effect in the prevention of photo-sensitivity; a dose as small as 50 mg. per day has been successful in preventing the onset of light dermatitis in several photo-sensitive patients (for example, the dermatitis associated with pellagra).

You mention that sulphonamides increase sensitivity to light, and I find it rather interesting to speculate on the cause of the pharmacological antagonism between sulphonamide and nicotinic acid, which not only exists in bacterial infections but also in this matter of light sensitivity. Incidentally, I have learned by painful and personal experience never to apply creosote to wooden structures when the sun is shining; any stray drops landing on the skin cause the rapid development of an uncomfortable localized erythema.—I am, etc.,

London, W.1.

R. J. GOURLAY.

Please Wash Your Hands

SIR,—I note with interest the letter from Dr. W. Edwards (*Journal*, August 22, p. 444) regarding free washing facilities in public conveniences. Two years ago I persuaded the Doncaster Health Committee to provide free hand-washing and drying facilities as an experiment in the men's convenience adjacent to the market, which is patronized by stallholders, the majority of whom are engaged in handling food. A wash-hand basin, soap dispenser, and electric hot-air hand drier were provided. The provision of such facilities is restricted to conveniences where an attendant is on duty in order to prevent misuse and damage, and the drier and soap dispenser have to be locked away when the attendant goes off duty, to prevent wilful damage. With these precautions I am pleased to be able to report that the equipment is still intact, is in daily use, and has proved popular. I might add that to reduce further the risk of spread of intestinal disease the flush controls of the w.c.s at this convenience were converted to foot operation in lieu of the usual hand control.—I am, etc.,

Doncaster.

H. L. SETTLE.

SIR,—Your correspondent, Dr. W. Edwards (*Journal*, August 22, p. 444) in his letter on the washing of hands, raises a problem which deserves immediate attention. The fact that gastro-enteritis has become endemic and widespread is a sad reflection on the standards of hygiene and food management in this country. The time has surely come for a new drive for cleaner food.

Food-handlers require constant education and supervision. A revival of the system of granting hygiene certificates to cafés and food stores would be a good thing. The refusal of such certificates, and even closure of the more unsatisfactory establishments, would have a salutary effect on the raising of standards. The handling of articles ready to eat, such as sandwiches and cakes, should be forbidden when once prepared. They should be individually wrapped ready for sale. Our milk is now almost entirely delivered in bottles, and yet our bread loaves are rarely wrapped before delivery.—I am, etc.,

Carmarthen.

J. E. CRANE.

Male Pseudohermaphroditism

SIR,—We have been interested to read the account of a case of male pseudohermaphroditism by Drs. D. C. Beatty, C. J. Champ, and G. I. M. Swyer (*Journal*, June 20, p. 1369). Owing to the rarity of such cases, mention of a similar one encountered by us some four years ago may be of interest.

The patient, a married woman aged 40, had always had amenorrhoea, but, except for the total absence of pubic and axillary hair, she had normal secondary sexual characteristics. As a child she had had treatment for a left inguinal hernia, and she was now admitted to hospital for repair of a right inguinal hernia. A tumour, shown histologically to be a testis, was removed at operation. No ovary or uterus could be felt through the hernial orifice, and bimanual examination showed a loosely attached vagina without a cervix or any nodule suggesting a uterus. The external genitalia were normal.

Further investigation could not be carried out as it was against the patient's wishes. She is one of a family of six girls; three are normal, married and with children; the other two are similar to the patient in that they have had permanent amenorrhoea, and one of them, who is married, has been told by a gynaecologist that she has no uterus.—We are, etc.,

Shrewsbury.

GREGOR H. GRANT.
A. GLANDON WILLIAMS.

Treatment of Patients with Myelosclerosis

SIR,—Dr. R. A. Hickling's account of the clinical features of myelosclerosis (*Journal*, August 22, p. 411) does not refer to the remarkable duration of time of the pathological process in some cases. In 1950 I saw a man, aged 66, with enormous splenomegaly and fairly severe anaemia. A diagnosis of myelosclerosis was confirmed, and a number of transfusions were given which kept the patient alive for a further two years. A striking feature of this case was that great splenomegaly had been detected in 1910, when he was warned not to play football for fear of rupturing the enormous spleen. Apart from abdominal discomfort, no symptoms were noted until March, 1950, when he had a very severe epistaxis.

A man aged 53 was found to have a spleen reaching to the navel 12 years before I saw him. There were no other symptoms and no anaemia, but the leucocyte count was 35,400 with a few abnormal cells and an occasional normoblast. This patient is still in good health, with no treatment, 16 years after the splenomegaly was first noted.

It seems impossible to accept the view of Heller and his co-workers,¹ which is shared by Hutt *et al.*,² that such a prolonged disease could possibly be closely allied to the leukaemias. It is both interesting and important that Dr. Hickling observed improvement after irradiation of the enlarged spleen in cases with leucocytosis and immature cells in the blood. Obviously, therefore, the enlargement of the spleen, which has often been regarded as compensatory, is

not purely so, but his observations seem to support the view of Rohr³ that the abnormal cells in this condition and in the leukaemias are mainly derived from the ectopic foci.—I am, etc.,

London, W.1.

A. PINEY.

REFERENCES

- ¹ *Amer. J. Path.*, 1947, 23, 327.
- ² *Blood*, 1953, 8, 295.
- ³ *Das menschliche Knochenmark*, 1949, 2nd ed. Thieme, Stuttgart.

Subacute Bacterial Endocarditis

SIR,—Professor R. V. Christie in his Refresher Course article on subacute bacterial endocarditis (*Journal*, August 22, p. 438) mentioned penicillin used prophylactically before dental extractions. He says, and I agree that it is so, that the usual dose is 500,000 units "an hour or two" before the operation with a similar dose on the two succeeding days.

I have never been able to understand why my medical friends, fully aware of the disastrous nature of the disease, and the harrowing treatment of it should it occur, do not insist on heavy doses for several days before the operation in an attempt to reduce the number of bacteria in the foci before they are stirred up and disseminated by the operation.

By all means continue after the operation as well, but one dose only at some casually indefinite time beforehand seems to me very like locking the stable door after the horse (or the bacteria) has bolted.—I am, etc.,

London, W.1.

F. R. COFFIN.

Symptoms of Malaria

SIR,—The recent correspondence in the *Journal* reminds me that I have frequently observed that the rigors and intermittent fever so characteristic of malaria tend to overshadow the fact that the first attack of malaria is not characterized by rigors and the fever is continuous. The second attack, which takes place six months later, is "classical" in its manifestations.

Gastro-intestinal symptoms frequently usher in an attack, being heralded by vomiting or diarrhoea, and patients who have been exposed to the infection and who present such symptoms should be suspect.—I am, etc.,

Northallerton, Yorks.

J. SHEGOG RUDELL.

Growth Hormone

SIR,—New information on endocrine factors influencing growth is accumulating with increasing velocity (*Journal*, August 15, pp. 353, 357, 383), and the time has probably come to be careful with the use of the term "growth hormone." Somatic growth is the final outcome of the interaction of a vast complex of agencies even in the intact animal; in the mutilated organism additional compensatory factors assume an important role in promoting or inhibiting growth. Thus, by suitable experimental interference, it is possible to demonstrate growth-promoting properties not only for somatotrophin and insulin, but also for thyroxine, cortisone, and testosterone, and consequently for thyrotrophin, gonadotrophin, and A.C.T.H. To call all these "growth hormones" would deprive the term of most of its usefulness. The term should be restricted to hormones having, in the intact and normal animal, a direct action on the somatic cells, in promoting protein synthesis and cell division.—I am, etc.,

Glasgow.

E. GEIRINGER.

POINTS FROM LETTERS

Cortisone in Rheumatoid Arthritis

Dr. H. F. West (Sheffield) writes: Dr. C. L. Cope, in part two of his Refresher Course article on the use of cortisone and A.C.T.H. (*Journal*, August 8, p. 332), said of rheumatoid arthritis that "with such great benefit to be expected in the majority of cases it is clear that the case for cortisone is strong." Unfortunately the "case for cortisone" has not been made out and careful studies have brought no proof that it favourably affects the course of the disease. There is no doubt that many patients benefit from cortisone treatment temporarily, but there is also little doubt that in certain circumstances it may do more harm than good.

Obituary

RENÉ SAND, M.D., LL.D.

The death of Dr. René Sand on August 23 was briefly recorded in last week's *Journal*. For many years he was one of the most prominent figures in the field of social medicine, and his work achieved international fame.

René Sand was born at Ixelles, in Belgium, on January 30, 1877. He graduated in medicine at the University of Brussels in 1900, and after postgraduate studies in Berlin and Vienna was appointed lecturer in pathology at his own university. His interest in social medicine was developing even at this early stage of his career, and in 1912 he founded the Belgian Social Medicine Association. During the first world war he served as a medical officer to units of the Belgian Army, and in 1921 he was elected secretary-general of the League of Red Cross Societies, a position which he held until 1936.

Sand's interest in the international unification of medical services found many outlets in the period between the two world wars. He realized his ambition to found an International Hospitals Association in 1929, and he was its first president. He was also president of its post-war successor, the International Hospital Federation, from its foundation in 1947 until his death. Only a few months ago he was chairman of the Eighth International Hospital Congress in London. A tireless supporter of the health work of the League of Nations, Sand was naturally prominent in the councils of its post-war successor. In 1946 he presided over a technical preparatory committee of the United Nations Organization to study proposals for international action in the health field, and he was one of the Belgian delegates to the conference called in New York by U.N.O. to draw up the constitution of the World Health Organization. In 1950 he was appointed chairman of the W.H.O. Expert Committee on Professional and Technical Education. During the preparation by the International Labour Office of its Convention on Minimum Standards of Social Security, a special W.H.O. consultant group, with René Sand as its chairman, was appointed to review the medical provisions of the convention.

Sand's work to improve the health of his own countrymen was recognized by his appointment as secretary-general of the Belgian Ministry of Health in 1937. He was responsible for the opening of the Institute of Hygiene and Social Medicine in Brussels in 1939. After the war, with the support of the Rockefeller Foundation, a chair of social medicine was established in the University of Brussels, and Sand was its first occupant. He held this position from 1945 to 1952. He also founded the Belgium Committee on Social Work and the International Conference on Social Work, presiding over several of the meetings of the latter organization. Earlier this year he was elected the first president of the Société Belge de Droit International Médical, which has for its object the study and development of international medical law.

Sand was a member of the B.M.A. from 1917 to 1947, and an honorary member of the American Medical Association, the American Hospitals Association, and the New York Academy of Medicine. In 1951 he received the honorary degree of LL.D. at Glasgow Uni-

versity. He contributed many books and papers to the literature of his subject. Best known in this country is his *Vers la Médecine Sociale* (1948), an English translation of which, *The Advance to Social Medicine*, was published in 1952. This is a historical summary of social medicine, which he described as "the final flowering of the preventive and curative art," and a definition of its aims and methods. He also wrote *Health and Human Progress* (1935), *Un Programme de Santé pour la Belgique* (1945), and *La Médecine Sociale* (1950).

René Sand was one of the founders of the present-day concepts of social medicine: he had a unique grasp of his subject and a profound influence on its development outside his own country. His work was recognized by the award of the Léon Bernard Foundation Prize, which was presented to him at the Fourth World Health Assembly in 1951. He was to have been one of the vice-presidents at the First World Conference on Medical Education held in London last week, but illness prevented his attendance, and news of his death reached London while the Conference was in progress. The paper he was to have read as the introductory address to the section of the Conference considering preventive and social medicine was published in last week's *British Medical Journal* (p. 471).

We are indebted to Dr. MELVILLE DOUGLAS MACKENZIE, Chairman of the Executive Body of the World Health Organization, for the following appreciation: Apart from his exceptional personal charm and boundless enthusiasm, Dr. René Sand, an early pioneer in social medicine, had a breadth of vision that was almost unique. He will be long remembered not only for his conceptions of the potentialities of international collaboration in medicine but also for his ideas of the part that medicine, as an art, should play in the social structure of every country. He invariably looked beyond the ordinarily accepted, but relatively narrow, limits in the prevention of disease to the new and wide responsibilities of medicine in the complex social structure of modern life.

He realized, and lost no opportunity of urging, that the full development of medicine could only be reached if its social and psychological aspects received a proper place in the training of medical students.

His lovable personality and his zest for work, combined with his creative imagination, invariably gave him a position as leader in the many fields of national and international social work in which he laboured so incessantly. Chairmanship of the Technical Preparatory Committee for the creation of the World Health Organization, his long activities with the Red Cross, his work in the study of special social problems in many countries, including the United Kingdom and France, as well as his outstanding contributions to social work in his own country, gave René Sand the opportunities he sought, and brought to him the deep satisfaction of creative achievement. In 1951 the Governments of 66 countries formally recognized René Sand's contribution to social medicine when the Assembly of the World Health Organization unanimously awarded him the Léon Bernard Foundation Prize for his contributions to international health. On this occasion he concluded his address with the following words:

"Neither students nor practitioners fully realize that, as Hippocrates already said long ago, in medicine the function of protecting and developing health must rank even above that of restoring it when it is impaired.

"If the nobility of medicine resides in the selflessness of the physician, the hygienist, and their assistant, its greatness resides in the scope of the services which they render; and, from this point of view, the medicine which preserves health has a considerably greater influence for good than the medicine which restores health."

René Sand was a great man and one who was deeply loved by many colleagues in every country of the world.

J. T. HUNTER, F.F.A.R.C.S.

Dr. J. T. Hunter, who held a number of appointments as an anaesthetist at hospitals in and near London, died after a long illness on August 9 at the age of 54.

John Trustcott Hunter was born on September 4, 1898, and received his medical training at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1925. He held the appointment of senior resident anaesthetist at St. Bartholomew's Hospital from 1926 to 1928, after which he was in general practice in the London area for some years. He then decided to specialize as an anaesthetist, and the list of hospitals he served is an impressive one. At the time of his death he was honorary consulting anaesthetist to the Metropolitan Hospital; King George Hospital, Ilford; King Edward VII Sanatorium, Midhurst; the Hospital for Tropical Diseases, London; and the Lord Mayor Treloar Orthopaedic Hospital, Alton. Earlier he had held the appointments of senior consultant anaesthetist to the Prince of Wales's General Hospital, Tottenham, and honorary anaesthetist to a number of other London hospitals. Hunter obtained the Diploma in Anaesthetics of the English Royal Colleges in 1944, and four years later he was elected a Fellow of the Faculty of Anaesthetists of the Royal College of Surgeons of England.

In 1939 he was appointed consulting anaesthetist to the plastic surgery and jaw injuries centre at the Queen Victoria Hospital, East Grinstead, where, perhaps, his warm sympathy for all who suffered showed itself most clearly. There he helped patients from some 14 different nations who had suffered facial injuries in the last war to regain faith in themselves and in the future by his constant encouragement and help. A founder member of the Guinea Pig Club at the hospital, he held the affection of all at East Grinstead, where he was known as "Uncle John."

Hunter had been seriously ill for nearly a year before his death, which took place in the hospital at East Grinstead. Big in stature and in mind, he was a born raconteur and an excellent mimic and could be relied upon to enliven any gathering by his presence. His death leaves a gap which will be difficult to fill. The sympathy of all his friends, colleagues, and patients will be extended to his widow.

We are indebted to Dr. A. A. MASON for the following appreciation: All who knew John Hunter have lost a dear friend. Of his professional capabilities, I will say little, for they have long spoken eloquently for themselves. If there was a difficult child to anaesthetize, we sent for John, and watched his gentle induction with pleasure and envy. If a small child was afraid, it was Uncle John who soothed it, turned its tears to smiles and peaceful unconsciousness. If an endotracheal tube would not obey our behest, it was John who guided our fingers. He was an anaesthetist by instinct. He did not attempt to explain why he did things correctly, he just did them. We younger anaesthetists knew the latest theory, but he knew much more—the practice of safe anaesthesia. If the anticipation of trouble is the mark of the good anaesthetist, then John was the prince of all, for he smelt trouble and prevented it before we were even mildly suspicious. His record speaks for itself—3,000 cleft-lip and palate operations over 20 years with the loss of only one child—a record that few will ever equal.

It is, however, as a man that we will miss him most. His geniality and generosity were unsurpassed. An evening with John was an evening of good food, good wine, and robust humour. John enjoyed life and lived it to the full. He was happiest when taking his friends down the river and making them merry. His dinner parties will long be remembered,

for he was a host who gave everything, most particularly himself. My last memory of John—and this was even after he had become seriously ill—was of him standing on the hearth, glass in hand, and surrounded by laughing, happy people; and it was John making them so. One of the best anaesthetists of his day, a man who enjoyed life and lived it well, a raconteur without peer, a man who hurt no one, a man one could always turn to in need, John was an institute—we shall rarely see his like again.

A. SMITH POOL, L.R.C.P.Ed.

We record with regret the death of Dr. A. Smith Pool at his home at Glasgow on August 16 at the age of 59 after a short acute illness.

Alexander Smith Pool was born at Annan on October 13, 1893, and was educated at Annan Academy. He left Dumfriesshire for Glasgow as a young man and in 1914 qualified as a member of the Pharmaceutical Society of Great Britain: it was typical of his industry and application that, although compelled by circumstance to seek part-time employment throughout his period of study, he qualified as a pharmacist before the statutory age of 21. With great courage he commenced business on his own account shortly after qualification, and by working long hours had soon established a flourishing business in one of the industrial areas of Glasgow. In 1919 he again showed his courage by beginning the study of medicine at Glasgow University. After he had completed his first year there circumstances compelled him to transfer to the Anderson College of Medicine—a forced decision which he always regretted. He was still conducting his business, and hurried from his classes to his dispensing every day of the week. On most evenings he left his business between 10 and 11 p.m. to pursue his medical studies till the early hours of the morning. However, he did well at the Anderson College and obtained the Scottish triple qualification in 1926 and secured the appointment of extra-dispensary physician to the Victoria Infirmary, Glasgow. In 1931 he was elected physician to out-patients. He was at first attached to the wards of the late Dr. O. H. Mavor (James Bridie), who appreciated his colleague's worth and frequently referred to Pool's knowledge of pharmacology and "its sane application to treatment." Dr. Pool enjoyed his out-patient duties, and was seen at his best surrounded by a group of students, his eyes sparkling, as he instructed them in the arts of percussion and auscultation.

Early in his medical career Dr. Pool took an active interest in medical politics, and was soon recognized as a good committee man. He graduated quickly to fill with distinction all the positions to which his colleagues could promote him. He was president of the Glasgow and West of Scotland Branch of the British Medical Association at the time of his death; chairman of the Glasgow Division in 1946-7; and from 1943 to 1951 he was a representative of the Division at seven Annual Representative Meetings. He was a member of the Central Council of the Association from 1945 to 1948, and at various times since 1943 he had served on the Scottish Committee, the Scottish Insurance Acts Subcommittee, the joint committee of the B.M.A. and the Pharmaceutical Society, the Joint Standing Formulary Committee, and the General Medical Services Committee and the G.M.S. Scottish Subcommittee. He had also been chairman of the Glasgow burgh panel and local medical committee. Recently he was a member of the Cohen Committee on Prescribing, an appointment of which he was proud.

Alec Pool was forceful and courageous in debate; he hit hard, but without rancour. After a particularly stormy session he would seek out his opponents and, amid laughter, count the points scored on each side. He was most jealous of the position of the doctor in the community. His experience and knowledge of business were such that at times he showed little respect for lay members of committees who presumed to criticize the work of the general practitioner. As one who had been successful in both business and medicine he had no doubts regarding which was the easier to attain. He was appalled by the recent increase in litigation against doctors, and proved himself a formidable opponent to those malcontents who made official complaints against their medical attendants. He never quite adjusted himself to the National Health Service, and only a few weeks before his death he was actively prospecting farming properties to which he looked forward to retiring in a short time. The wheel had come full circle, for he was at heart a countryman and was reared on a farm at Annan. He had only three interests—the practice of medicine, medical politics, and farming; he was eminently successful in two of these fields, but, alas, the third escaped him. The sympathy of his colleagues and friends goes out to his wife and only daughter.—A. B.

After a comparatively short illness, which she endured with her customary fortitude, Dr. ROSEMARY OWEN MORRIS died at Caernarvon on August 15 at the age of 60. Born on June 21, 1893, she was the daughter of the late Dr. R. Owen Morris, of Aberdovey, who was well known throughout the Principality as the active propagandist of the Welsh Tuberculosis Association. After studying music and teaching the subject for a few years, she later became a medical student and obtained the degrees of M.B., Ch.B. at Edinburgh University in 1920. Two years later she took the diploma in public health, and in 1928 proceeded to the M.D. The public health service soon attracted her, and she held posts at Huddersfield, Norwich, and the Cefn Mably Sanatorium, near Cardiff. In 1950 she joined the Caernarvonshire health department and was a most loyal and energetic colleague. A member of the British Medical Association and the Society of Medical Officers of Health, she was also a keen supporter of the North Wales Branch of the Medical Women's Federation. She possessed an abounding sense of humour and always had a cheerful greeting for her colleagues. All her colleagues mourn the loss of a sweet personality whom they admired and respected.—D. E. P.-P.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

In Congregation on June 23 and 24 the following medical degrees were conferred:

M.CHIR.—*G. C. Attenborough.
M.B., B.CHIR.—*J. Cocker, *H. E. D. Lloyd, *J. E. C. Tower, *D. B. Bower, *R. A. Miley, *R. A. Roxburgh, *J. L. Stevens, *A. J. F. Barratt, *R. M. Butcher, *H. F. Cowper Johnson, *R. J. W. Lambert, *M. B. Teal, *P. M. Hacking, *M. B. Heywood-Waddington, *A. R. Kittermaster, *I. B. Lyon, *A. McL. Keil, *P. C. Vivian, *C. M. Yates, *E. R. Davies, *J. P. F. C. Evans, *R. V. H. Jones, *J. S. Lloyd, *W. O. McCormick, *G. Meachim, *D. G. Montefiore, *P. H. Pullen, *I. R. D. Reid, *N. W. H. Young, *A. B. Aistrop, *T. C. Bradford, *M. J. Clarke-Williams, *I. M. J. Mair, *R. Routledge, *D. W. Couch, *A. H. Dimond, *P. W. Hayward, *J. McM. Mennell, *H. G. Penman, *V. G. Caiger, *R. H. Champion, *K. Coventry, *E. J. Cretney, *M. G. A. Forrest, *R. Gardner, *A. F. Hignell, *J. A. Holland, *E. O'G. Kirwan, *D. G. Lethem, *R. J. Sellick, *D. Campbell, *D. N. M. Goodson, *H. R. M. Johnson, *A. C. Markland, *P. Sleight, *G. C. E. Wilson, *R. V. Jones, *J. A. McEwan, *B. A. Maurice,

*M. J. Mynott, *M. J. Pritchard, *M. C. Guard, *J. E. Lennard-Jones, *N. D. Mackichan, *A. B. Myles, *N. P. Burns, *G. M. Cochrane, *P. F. Dixon, *B. G. Gradwell, *I. Lennox-Smith, *N. V. D. Bunker, *P. M. E. Dutton, *C. B. Hobbs, *M. V. J. Fitzgerald, *R. W. Hall, *H. T. Thomas, *R. J. Vaughan, *P. Wellings, *M. J. W. Penn, *G. D. H. Shephard, *H. J. Hodgson, *A. J. Kenmuir-Evans, *J. M. Clifford, *J. E. Goodess, *M. B. Harris, *A. F. Madge, *R. K. Waterhouse, *M. Trede, R. J. Daniels, *Judith M. Fitzsimons, *Beryl P. Jones, *Thérèse M. Vanier, *Sheila M. Houghton, *Ruth Hutchinson, *Joy Paterson, *Inez M. P. Smeed, *Elizabeth H. M. Walker, *J. B. Carver, *D. M. Davies, *M. Heslop.

In Congregation on July 13 the honorary degree of ScD. was conferred on Harold Robert Dew, Bosch Professor of Surgery and Dean of the Faculty of Medicine in the University of Sydney.

*By proxy.

UNIVERSITY OF DURHAM

In Congregation on July 3 the following medical degrees were conferred:

M.D.—J. P. Anderson, T. Bird, Ruth M. Dearing, D. H. Turnbull, *T. Manners, *W. M. Ross.

PH.D. IN PURE SCIENCE.—Phyllis A. Armstrong, M.B., B.S.

M.B., B.S.—J. Baldasera, J. Beveridge, Barbara H. Brown, W. D. Busby, C. E. Camm, M. D. Cashman, Margaret E. Chitty, D. E. Clare, K. M. Coia, W. G. Cooke, N. E. Crumpton, A. A. Darkwa, J. Deegan, K. A. Delpeche, T. F. Dias, P. R. Dingle, T. Dowell, G. W. H. Fisher, M. L. Fisher, J. B. Foster, W. D. Glass, A. H. Grabham, J. P. Graham, Jean H. Graham, W. Graham, K. C. Grant, E. A. Haddock, Thelma Haddock, J. N. Harkness, J. D. Heaton, K. N. Henderson, R. J. Henry, J. M. Hipkin, Mary E. Hobson, Elizabeth A. Hopkinson, S. R. Hutton, N. J. Jackson, G. L. Johnston, Jane M. Lee, J. A. Little, Beatrice M. Lowry, J. F. Lund, H. Madgwick, G. N. Marsh, J. F. Milligan, Joyce M. Mitcalfe, Mary J. Mossman, E. Muris, R. S. Parsons, H. G. Pledger, J. Ridley, P. F. Roythorne, Marion Rutter, R. P. Ryan, G. Safe, W. E. Seales, D. H. Spark, H. S. Spiller, Pat E. Stephenson, Doris Story, D. Strachan, C. W. Thomson, M. E. Tulloh, H. A. S. Walker, Daphne Warner, R. B. Welch, F. W. Woodruff, *D. C. Dove, *H. T. John, *Ione M. Martin, *T. H. Oglesby.

*In absentia.

UNIVERSITY OF BIRMINGHAM

In Congregation on July 4 the following degrees were conferred:

M.D.—R. L. Bishton, A. B. Black, J. T. A. George, W. C. Smallwood, Hebe F. Wellbourn.

PH.D.—W. St. C. Symmers, M.D., M.R.C.P. (in absentia).

M.B., Ch.B.—P. J. F. Aaronicks, Betty A. Astle, Patricia Baker, P. Beavon, Irene M. Bidwell, P. W. S. Blake, M. B. Bottrill, A. J. Bray, R. C. Brown, R. MacA. Brown, Jennifer Browne, Anne F. Calladine, A. R. Chrispin, Elinor B. Clark, D. B. Clarke, G. K. Clarke, K. A. Cowan, J. D. Cumming, I. J. Cunningham, T. P. Daly, Doris M. Davies, R. Davis, W. K. Eltringham, *S. E. Evans, J. Farrington, Frances J. Folley, Patricia A. Gough, L. A. Green, D. D. Griffiths, A. B. Guest, G. G. Habib, W. P. Hayne, R. N. Hill, K. C. B. James, Verna S. James, Julie Jones, Mary F. Knight, P. R. Knight, Kathleen M. Lumb, Dorothy M. Mahabir, D. P. Mason, M. D. Ma'tuk, Hazel R. Meacock, D. B. Minton, *S. Naimi, G. D. Oates, W. J. O'Connell, G. D. Parbrook, M. D. Parker, H. G. Parkes, J. B. Pearson, T. P. Perry, *B. Purdy, C. O. Quarcoopome, C. C. G. Rawll, Gweniver W. Roberts, M. H. Rogers, Pamela M. Rose, G. H. Shaw, G. Singh, S. H. Taylor, Sheila M. Topping, *D. Vuckovic, A. J. Wainwright, P. J. C. Walker, A. D. Wardle, J. Warner, B. Watson, D. G. Williams, P. M. Wine, P. E. Woods, *P. N. Wormald, A. Yeadon.

*Distinction in paediatrics and child health. *Distinction in medicine.

The Services

Major-General R. D. Cameron, C.B., C.B.E., M.C., late R.A.M.C., retired, has been appointed Colonel Commandant, R.A.M.C., in succession to Major-General (Honorary Lieutenant-General) Sir T. O. Thompson, K.C.S.I., C.B., C.B.E., whose tenure has expired.

Surgeon Commander S. M. Whitteridge, R.N.V.R., and Surgeon Lieutenant-Commander D. A. Warden, R.A.N.R., have been awarded the Royal Naval Volunteer Reserve decoration.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending August 15 (No. 32) and corresponding week 1952.

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

A blank space denotes disease not notifiable or no return available.

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	22	1	3	0	3	19	2	8	0	
Dysentery ..	217	34	65	2	3	119	22	69	2	6
Encephalitis, acute	8	1		1		4	2	0	0	
Enteric fever: Typhoid ..	10	0	0	0	0	4	0	3		1
Paratyphoid ..	10	0	0	0	0	62	1	1(B)		0
Food-poll-oning ..	389	21		2		150	21			0
Infective enteritis or diarrhoea under 2 years ..										14
Measles*	2,123	67	24	41	26	7,010	926	47	68	146
Meningococcal infection ..	31	1	16	2		18	0	8	2	2
Ophthalmia neonatorum ..	32	2	9	0		19	3	10	0	
Pneumonia†	238	13	117	2		239	12	118	4	
Poliomyelitis, acute: Paralytic ..	186	14	3	17	8	167	16	8	8	6
Non-paralytic ..	132	3				83				
Puerperal fever‡	322	38	17	2		242	44	11	0	
Scarlet fever ..	488	25	109	22	31	720	72	121	9	34
Tuberculosis: Respiratory ..			124	21	7			133	25	16
Non-respiratory ..			18					25		2
Whooping-cough ..	4,681	428	303	49	69	1,766	97	92		114

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0		0	1	0		0	0
Dysentery ..	0	0				0	0			
Encephalitis, acute		0					1			
Enteric fever ..		0	0			1	0			
Infective enteritis or diarrhoea under 2 years ..	9	2		1	1	4	1	1	1	0
Influenza ..	2	0	0	0	0	3	1		0	0
Measles ..		0	0		0		1		0	0
Meningococcal infection ..		0	0				0			
Pneumonia ..	116	22	17	9	4	134	9		4	5
Poliomyelitis, acute	9	2				8	3			
Scarlet fever ..		0	0		0		0			
Tuberculosis: Respiratory ..	78	10	11	1	6	74	16	14	1	6
Non-respiratory ..		1	0	0	2		2			
Whooping-cough ..	2	0	1	0	0	0	0		0	0
Deaths 0-1 year ..	209	25	33	5	6	195	17	23	10	8
Deaths (excluding stillbirths) ..	4,500	648	483	93	12	3,962	583	478	91	116
LIVE BIRTHS ..	7,861	1213	857	203	466	7,209	1078	916	211	335
STILLBIRTHS ..	208	29	20			163	14	14		

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

Vital Statistics

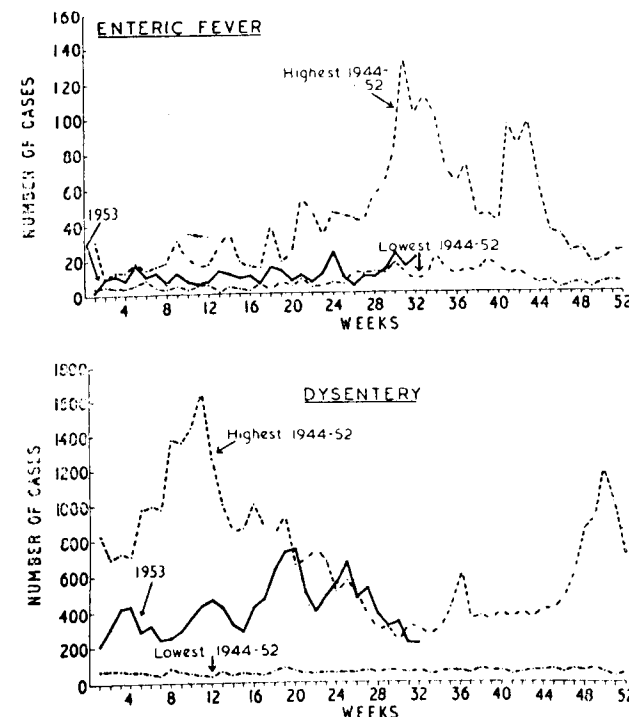
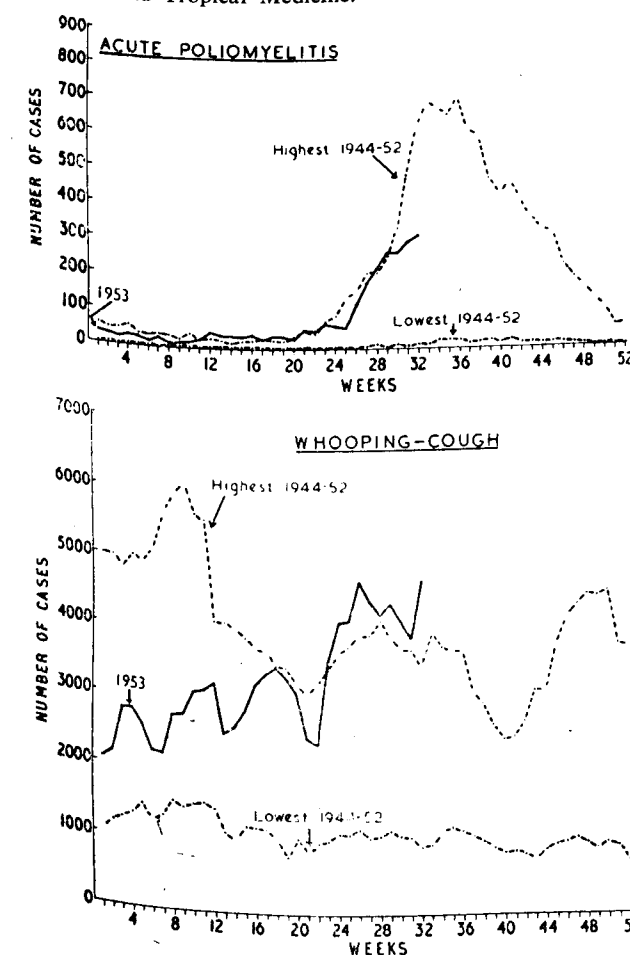
Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ended August 22 (33rd week of the year) were as follows: paralytic, 144 (186); non-paralytic, 126 (132); total, 270 (318). This is a decrease of 48 compared with the previous week, the figures for which are in parentheses. The individual districts which have notified 20 or more cases in the year to August 22, with incidences per 100,000 in parentheses, are as follows: Southend-on-Sea C.B., 43 (28.38); Liverpool C.B., 51 (6.44); Birmingham C.B., 55 (4.92); Coventry C.B., 108 (41.38); Leicester C.B., 28 (9.79); Lewisham M.B., 24 (10.57); Blackpool C.B., 24 (16.29); Camberwell M.B., 21 (11.59); Islington M.B., 24 (10.20); Bournemouth C.B., 31 (22.32); Bristol C.B., 21 (4.73); Nottingham C.B., 23 (7.40); Taunton M.B., 25 (72.25); St. Pancras M.B., 23 (16.48); Carlisle C.B., 22 (32.40); and Manchester C.B., 20 (2.83).

There were 48 fewer notifications during the 33rd week than during the 32nd. This decrease, occurring before the zenith was to be expected, is encouraging, particularly as the fall is most marked in the number of paralytic cases (42 less). There is still no sign of dangerous epidemic foci in the larger centres of population.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest fluctuations in the trends of infectious diseases in England and Wales during the week ending August 15 were decreases of 607 in the number of notifications of measles, from 2,730 to 2,123, and 202 for scarlet fever, from 690 to 488, and an increase of 817 in the number of notifications of whooping-cough, from 3,864 to 4,681.

The largest falls in the notifications of measles were 149 in Lancashire, from 461 to 312; 91 in Lincolnshire, from 195 to 104; and 57 in Wiltshire, from 94 to 37. The decline in the incidence of scarlet fever was due to small falls in most areas of the country; there were no large fluctuations in the local trends. The largest rises in whooping-cough notifications were 106 in Yorkshire West Riding, from 232 to 338; 79 in London, from 349 to 428; and 70 in Hertfordshire, from 79 to 149; 22 cases of diphtheria were notified, the same number as in the preceding week.

318 cases of acute poliomyelitis were notified, and these were 5 more for paralytic and 16 more for non-paralytic cases than in the preceding week. The largest returns were Warwickshire 36 (Coventry C.B. 21, Nuneaton M.B. 5, Birmingham C.B. 4), Lancashire 31 (Liverpool C.B. 20), Essex 19 (Southend-on-Sea C.B. 5), London 17 (St. Pancras 4), Kent 16, Sussex 16, Southampton County 15 (Bournemouth C.B. 4), Dorset 12 (Poole M.B. 4), and Middlesex 12.

217 cases of dysentery were notified during the week—the same number as in the preceding week. The chief centres of infection were Lancashire 45 (Liverpool C.B. 11), London 34, Middlesex 16, Yorkshire West Riding 14, Surrey 11 (Epsom and Ewell M.B. 10), and Kent 11.

Northern Ireland Quarterly Return

The Northern Ireland Registrar-General, in his return for the quarter ended March 31, 1953, records that the birth rate was 21.3 per 1,000 population, being 0.5 higher than March quarter 1952, and that the death rate was 13.4 per 1,000 population—an increase of 0.4 over the corresponding quarter last year, but 1.3 below the average rate for the first quarters of the five years 1948-52. The higher death rate in March quarter 1953 was mainly due to an increase in the number of deaths from the respiratory diseases, especially influenza, pneumonia, and bronchitis. The death rate from tuberculosis, which has continued to fall, was returned at 32 per 100,000 population, a decrease of 8 com-

pared with March, 1952, and the lowest record for March quarter of any year. One death was registered as due to diphtheria—the first from this disease since June quarter 1951. The number of cases notified was 3 as compared with 2 for the first quarter of 1952.

Week Ending August 22

The notifications of infectious diseases in England and Wales during the week included scarlet fever 431, whooping-cough 4,341, diphtheria 11, measles 1,558, dysentery 235, paratyphoid fever 7, typhoid fever 3, and food-poisoning 339.

Medical News

White Bread.—Statutory Orders which came into force on August 30 have removed the restrictions on the extraction rate of flour, thus permitting a return to the white loaf. The Orders require, however, that calcium in the form of creta praeparata (1 oz. to 20 lb.—1 g. to 320 g.) shall be added to all flours; and that iron, aneurin, and nicotinic acid shall be added to flours of extraction rate lower than 80%, the rate for national flour. Only bread made from national flour remains controlled in price.

Artificial Sweeteners in Food.—In future only saccharin will be permitted as an artificial food sweetener (Artificial Sweeteners in Food Order, 1953). This follows a recommendation from the Medical Research Council. Saccharin is known to be harmless, but according to the Council's Food Adulterants Committee the use of certain other artificial sweetening agents may be dangerous to health.

Edridge-Green Lectures.—The late Mr. F. W. Edridge-Green, who was internationally distinguished for his work on the testing of colour vision (see *Journal*, May 2, p. 998), has left £3,000 to the Royal College of Surgeons. The money is to form a fund to pay for lectures at the College, "to be called 'The Edridge-Green Lectures,' one lecture each year to be on vision or colour vision."

Local Registration in East Africa.—The Uganda Legislative Council has approved a Bill enabling those who obtain the qualification L.M.S. (E.A.) from Makerere College to be registered for medical practice anywhere in East Africa. Before full local registration is granted, however, two years must be served as an intern at an approved hospital, and, after registration, five years in the Government medical service. Dr. J. K. Hunter, who moved the new Bill in Legislative Council, recalled that two years previously the General Medical Council had sent a delegation of visitors to examine the standard of training at Makerere. As a result of what they saw, they had recommended that the Makerere qualification might well become locally registrable. Dr. Hunter added that this was a step towards full recognition by the G.M.C.

Van Meter Prize Award.—The Van Meter Prize Award of \$300 is again offered by the American Goitre Association for the best essays submitted describing original work relating to problems of the thyroid gland. Essays should not exceed 3,000 words in length, and a typewritten copy, in duplicate and double spacing, should be sent to the Corresponding Secretary of the Association, Dr. John C. McClintock, 149½ Washington Avenue, Albany 10, New York, not later than January 15, 1954. The award, which is open to both medical and non-medical workers, will be made at the Annual Meeting of the American Goitre Association in Boston, Massachusetts, next April.

Journal Index.—The half-yearly indexes to Volume I of the *Journal* and the *Supplement* for 1953 are now being sent to members who receive them regularly and to subscribers. Members who have not previously asked for the indexes can obtain copies, post free, on application to the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Mr. St. J. D. Buxton is leaving for Greece on September 7. He is going there at the invitation of the United Nations Organization to act as social welfare adviser. He will be away for about a month.

COMING EVENTS

The St. Thomas's Hospital Old Students' Dinner will be held at the Connaught Rooms, Great Queen Street, London, W.C.1, on October 2 at 7 p.m. The chair will be taken by Sir Henry Letheby Tidy. Tickets for the dinner (price 22s. 6d.) may be obtained from the secretary, St. Thomas's Hospital Medical School, London, S.E.1.

Symposium on Child Health in the Tropics.—Immediately following the seventh International Paediatric Congress (Havana, October 12 to 17) a symposium on Child Health in the Tropics will be held at the University College of the West Indies, Mona, St. Andrew, Jamaica, from October 20 to 27. Those wishing to attend or requiring further information are asked to communicate with the secretaries, Symposium on Child Health, Division of Medicine, University College of the West Indies, Mona, St. Andrew, Jamaica, B.W.I.

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 37, No. 9) will be available in a week's time. The contents include:

ROLE OF OXYGEN IN THE GENESIS OF RETROLENTAL FIBROPLASIA. A PRELIMINARY REPORT. Norman Ashton, Basil Ward, and Geoffrey Serpell.
EARLIEST SYMPTOMS OF DISEASES OF THE MACULA. Marc Amsler.
VISUAL ACUITY AND THE CONE CELL DISTRIBUTION OF THE RETINA. E. R. Harrison.
PLASMA CELL MYELOMA OF THE ORBIT. Edwin Clarke.
CHANGES IN THE REFRACTIVE POWER OF THE CORNEA DURING GROWTH. OBSERVATIONS ON THE RABBIT. Arnold Sorsby and Michael Sheridan.
CURARE AND CURARE-LIKE PRODUCTS IN CATARACT SURGERY. L. P. Agarwal.
PENETRATING CORNEAL GRAFT. ORIENTATION OF THE INITIAL PENETRATION OF THE TREPHINE INTO THE HOST CORNEA. J. C. Michaelson.
DETECTION OF GLAUCOMA IN GENERAL PRACTICE. F. A. Williamson-Noble.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

APPOINTMENTS

BLOTT, T. D., M.B., B.S., D.P.H., Assistant County Medical Officer and Medical Officer, Hucknall Urban District Council, Nottinghamshire.
McDOUGALL, JOSEPH HENRY, M.B., Ch.B., D.P.M., Medical Superintendent and Consultant Psychiatrist, Moss Side Hospital, Maghull, near Liverpool.

MANCHESTER REGIONAL HOSPITAL BOARD.—I. MacD. G. Stewart, M.D., M.R.C.P., Consultant Physician, Victoria Hospital, Blackpool; J. G. Thurston, M.B., B.Chir., M.R.C.O.G., Consultant Obstetrician and Gynaecologist, Blackburn and District Hospital; T. D. Culbert, M.B., Ch.B., D.A., Consultant Anaesthetist, United Manchester Hospitals and North Manchester Hospital; D. C. Lindars, M.B., Ch.B., Tuberculosis Physician and Medical Officer in charge of Miniature Mass Radiography Unit based on Salford; J. Rimington, M.B., Ch.B., Tuberculosis Physician and Medical Officer in charge of Miniature Mass Radiography Unit based on Stockport.

NORTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD.—G. O. Storey, M.B., B.Chir., M.R.C.P., D.Phys.Med., full- or maximum part-time Consultant Physician in Physical Medicine at hospitals and clinics within the Central and Hackney Groups.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Boucher.—On August 18, 1953, at Dorchester, Dorset, to Betty (formerly Thompson), wife of P. R. Boucher, a son.
Davies.—On August 22, 1953, at the Bromhead Maternity Home, Lincoln, to Eva, wife of Dr. Hartley Davies, of High Barn, Welton, Lincoln, a son.
Lucas.—On August 26, 1953, at Bristol Maternity Hospital, to Mary (formerly Campbell), wife of Dr. George Lucas, a daughter—Angela Jane.
Reilly.—On August 24, 1953, at the London Hospital, London, E., to Joy (formerly Petric), wife of Michael Reilly, M.S., F.R.C.S., a son—Christopher Michael.

DEATHS

Clarke.—On August 3, 1953, at Pine Cottage, Foxford, Co. Mayo, Eire, Isaac Clarke, L.R.C.P. & S.I. & L.M., late of Slough, Bucks.
Horne.—On August 10, 1953, at the City Isolation Hospital, Lincoln, Hush Wilson Horne, L.R.C.P. & S.Ed., L.R.F.P.S., D.P.H.
Mead.—On August 16, 1953, at "Bryn-v-Mor," Yarmouth Road, Lowestoft, Suffolk, John Clarke Mead, M.B., F.R.C.S., aged 72.
Pollock.—On August 4, 1953, at East London, South Africa, Andrew Maclean Pollock, M.B., F.R.C.S.Ed.
Rickett.—On August 13, 1953, at Crowmarsh, Oxon., Gerald Russell Rickett, O.B.E., M.D.
Wood.—On August 6, 1953, in Sussex, John Alfred Wood, M.B., B.Ch., of 10, Canterbury Road, Oxford.

Any Questions?

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

Ocular Signs of Drunkenness

Q.—Is the reaction of the pupil helpful in establishing a diagnosis of drunkenness? In most cases I find the pupils widely dilated and only sluggishly, if at all, responsive to light. Is this due to a specific partial paralysis of the third cranial nerve? Could fright or fatigue account for this finding? Are there any other helpful ocular signs of drunkenness?

A.—In this country it is generally accepted that the reaction of the pupil is helpful in establishing a diagnosis of drunkenness. In the early stages of alcoholic intoxication the pupils are dilated; they may be unequal. They often contract sluggishly and may dilate again in strong light even if the light is still directed into the eye. Swedish observers, however, state that the so-called slow reaction of the pupil is a normal phenomenon correlated with the original size of the pupil (Skoglund, C. R., *Acta physiol. scand.*, 1943, 6, 96). In advanced intoxication and in coma the pupils may be pinpoint.

The changes in the pupil in alcoholic intoxication are probably due to the same mechanisms as the comparable changes seen during the stages of general anaesthesia. Since the early stage of alcoholic intoxication corresponds to the "excitement" stage of general anaesthesia, it seems likely that the dilated pupils are in part, at least, caused by an increased secretion of adrenaline. Depression of the parasympathetic system may also play a role. The dilatation of the pupil which occurs in fright is due to sympathetic overaction perpetuated by the secretion of adrenaline. Neither fright nor fatigue would usually give so prolonged an effect as occurs in alcoholic intoxication.

In drunkenness the eyelids are usually swollen and the conjunctivae suffused. Diplopia may occur, but strabismus can seldom be demonstrated by objective tests. Swedish observers regard the presence of nystagmus as the most valuable ocular sign of alcoholic intoxication. A fine lateral nystagmus is said to appear at blood alcohol concentrations of 0.08 to 0.10%. The sign disappears at concentrations of over 0.30%. Its absence is not therefore proof of the absence of alcoholic intoxication.

Recurrent Genital Herpes

Q.—What is the best treatment of recurrent herpes genitalis? Would circumcision help? Is there any danger of a man who is about to marry infecting his wife?

A.—The treatment of recurrent herpes is rather unsatisfactory, particularly the form occurring on the genitals. If the eruption is entirely limited to the prepuce circumcision would be worth trying, but not otherwise. Alternatively, the method of repeated smallpox vaccinations (eight times at fortnightly intervals) should be employed. There is, no doubt, a theoretical possibility of marital infection, but in actual practice this does not often seem to occur. The virus of herpes is very widespread throughout the human race, and it seems likely that recurrent attacks depend more upon the state of immunity of the subject than upon opportunities of infection with the virus. The disease, although a nuisance, is very seldom anything more; for this reason, the risk of marital infection need not be regarded with any great alarm.

Toxaemia of Pregnancy and Blood Groups

Q.—Is there any known relationship between blood-group incompatibilities between husband and wife and the occurrence of toxæmia of pregnancy?

A.—In the past it has been suspected that there might be a relationship between blood-group incompatibility between foetus and mother and the occurrence of toxæmia in the mother. However, it has never been established that there is such a relationship, and the general opinion is that incompatibility of this kind either plays no part at all, or, at the most, accounts for only a few cases.

Trichomonas Infection in the Male

Q.—I suspect a husband of reinfecting his wife with *Trichomonas vaginalis* during intercourse. Is this likely in the absence of a urethral discharge? How should the diagnosis be made in the husband? What treatment should be given to the husband if my suspicions are correct?

A.—*Trichomonas* infection may be present in the male without there being any obvious urethral discharge. The organisms can sometimes be demonstrated by scraping the epithelium just within the urethral meatus with a blunt curette, or in material obtained after prostatic massage. They have also been demonstrated in swabs taken from within the prepuce. In infected cases the urine is said to be typically hazy and containing fine threads; if it is centrifuged lightly the organisms can sometimes be found in the deposit. The material obtained by any of these means is preferably examined immediately both by means of a hanging drop preparation and by means of culture, for which a special medium is necessary. If there is any delay between collection and examination the swab should be kept moist with saline.

There is no specific remedy for trichomonas infection in the male. Various urinary antiseptics such as hexamine have been tried, and so have all the antibiotics and sulphonamides. None is of much value, although claims have been made for aureomycin. In fact there is a good deal of evidence to show that the infection is self-limiting in the male and that it disappears within three months and often in less time than this. The so-called chronic cases are probably examples of reinfection, husband and wife infecting each other in turn. This vicious circle can be broken by abstinence from coitus until the woman is cured, the infection in the male meanwhile dying out of its own accord.

Technique of Bronchography

Q.—What is the best way of performing bronchography?

A.—The selection of the method for bronchography depends on the situation and extent of the area required to be visualized. For example, the major bronchi in the right lower lobe can often be visualized by simply dropping the opaque medium over the back of the tongue while holding the tongue forward to prevent swallowing. This can be done without analgesia, but most people prefer analgesia of the nasopharynx and larynx. Lignocaine is the usual analgesic employed (in 4% solution as a surface analgesic for this purpose). A small piece of rubber tubing is passed through the nose until it rests just above the larynx. The tongue is held forward and the opaque medium slowly injected, tilting the patient to whichever side is necessary. This method is very successful for the right middle lobe and both lower lobes. It is not so successful for the upper lobes, except in the hands of an operator with wide experience.

Direct injection into the trachea just below the cricoid is probably the most effective method. Under local analgesia a fairly wide-bore needle is inserted into the trachea and a few drops of cocaine are injected through it to abolish the cough reflex before injecting the opaque medium. The needle is left *in situ* while the patient is tilted into the various positions.

Heavy viscous media are now being abandoned for bronchography because they remain in the lung for a very long period. Not only may they obscure subsequent alterations in a lesion, but they may also provoke an oil fibrosis. Water-soluble media are now available. These are quickly and completely absorbed, but they are temporarily rather irritating and deeper local analgesia is required to inject them successfully.

Death on the Table

Q.—Who has the legal responsibility when a patient dies under an anaesthetic, the anaesthetist or the surgeon? Is there any difference between Scottish and English law in this connexion?

A.—If a patient dies under anaesthesia, responsibility for the death does not necessarily rest upon either surgeon or anaesthetist. Legal responsibility, in the sense presumably intended by the question, will exist only if either surgeon or anaesthetist has failed in the proper execution of his functions as a skilled professional person.

An anaesthetist is an independent expert. Although not legally responsible if the death has resulted from a genuine and understandable error of judgment, he is expected to exercise a degree of skill, care, and judgment commensurate with his professional qualifications and experience. It is his responsibility to assess the fitness of the patient to support the strain of anaesthesia, to advise regarding premedication, to select a suitable form of anaesthesia, to ensure that the administration is satisfactory, and to have available and apply when necessary the appropriate measures for resuscitation. The decision to operate, the choice of operation, and the actual operative procedure is the responsibility of the surgeon, and, again, legal responsibility for a death will only exist if he has failed to exercise that degree of skill, care, and judgment which can reasonably be expected from a professional person of his particular qualifications and experience.

There is no difference between Scots and English Law in the matter. In both countries, the circumstances of the particular case would fall to be considered, and the important elements are, not understandable errors of judgment, but failure to exercise the requisite degree of judgment, skill, and care.

There is no case on record where criminal proceedings or a successful civil action has been taken against a medical man in respect of a death under anaesthesia, although there have been unsuccessful actions.

Diagnosis and Treatment of Congenital Syphilis

Q.—What surveillance and treatment should be given to the baby of a syphilitic mother who (a) had no treatment during pregnancy; (b) was treated thoroughly during pregnancy?

A.—(a) A baby born of a syphilitic mother who has had no treatment may or may not have contracted the disease, and it should be noted that in those that are born infected there may be no demonstrable *T. pallidum* or clinical manifestations. A child can also acquire the disease during parturition from a mother with an active lesion on the genitalia.

On the clinically normal infant serological tests should be carried out soon after birth and repeated one month, three months, six months, and 12 months later. If all these tests are negative it may be assumed that the child has escaped infection.

In the treatment of congenital syphilis the optimum dosage of penicillin has not yet been established. The dosage recommended varies from 100,000 to 300,000 units of procaine penicillin in arachis oil with 2% aluminium monostearate daily for 10–15 days. In the emaciated infant it is advantageous to give three-hourly injections of aqueous penicillin G (total dosage 200,000 to 600,000 units per kg. of body weight). It is not necessary to follow this up with

arsenic or bismuth. Relapse, clinical or serological, is extremely rare, and in such cases the course of penicillin is repeated.

(b) Thorough treatment of a syphilitic mother during pregnancy will ensure a non-syphilitic baby, but serological tests should, as a precautionary measure, be carried out at the intervals stated above.

Efficiency of Inunction

Q.—Some therapeutic substances are given by inunction. What is the evidence that they are absorbed through the skin and exert a pharmacological effect on the underlying tissues? I have in mind medicaments such as the creams which contain adrenaline, and the mercury inunction of former days. If it is true that certain drugs can penetrate the skin in this way, on what does this property depend?

A.—The evidence that some therapeutic substances are absorbed through the skin is that they are excreted in the urine. Thus mercury can be detected in the urine within 24 hours of its inunction. Methylsalicylate can be detected in the urine within one hour. Sulphur and atropine are also absorbed through the skin when applied as ointments. Some say that iodine is, but some deny it. There is, however, no evidence that adrenaline is absorbed through the skin from a cream containing adrenaline. Drugs can readily be drawn through the skin into the general circulation by electrolysis, but as soon as they reach the dermis they are picked up by the blood stream and dispersed throughout the body. Absorption depends chiefly on physico-chemical properties rather than on chemical constitution. Substances to be absorbed must be soluble in both oil and water.

Masks for Industrial Dusts

Q.—What are the best kinds of mask to use against industrial dusts, such as asbestos powder, which are irritating to the nose and throat? The patient in question develops a dermatitis when rubber is in contact with his skin.

A.—The use of a mask for protracted periods to give protection against dust is not satisfactory, and protection against a dangerous dust such as asbestos should never be left to this means.

When temporary protection is required, however, the use of a dust respirator has value. The standard models are usually fitted with a rubber face-piece, but it is rare for the particular rubber used in these respirators to give rise to skin trouble. There is, however, on the market a much simpler respirator with an aluminium frame and employing cotton-wool as the filter. This is effective in stopping the inhalation of a certain amount of dust, but it has no official approval for use with asbestos. Many of these masks are to be seen at the Home Office Museum, in Horseferry Road, London, S.W.1, where it is also possible to see examples of effective methods of suppressing dust in industrial processes.

Correction.—In Dr. M. E. M. Herford's letter (*Journal*, August 22, p. 441) on breast-feeding in Oxford, the sentence, "Skin infections, particularly eczema, were not frequent in bottle-feds in each age group," should have read, "Skin infections . . . were more frequent in bottle-feds . . ."

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1. on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London.* MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.* B.M.A. SCOTTISH OFFICE: 7, Drumshugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 26 1953

In the summer of 1950, when the National Health Service had been in operation for two years and the British Medical Association's report on "General Practice and the Training of the General Practitioner" had just been published, the Council decided that an authoritative review of the actual conditions of general practice should be undertaken. For this purpose it appointed a Special Committee "to review the present position in general practice, its difficulties and its trends, both generally and with reference to the two years' experience of the National Health Service Acts, and to the B.M.A. report on 'General Practice and the Training of the General Practitioner,' and to make recommendations." The Committee instructed Dr. Stephen J. Hadfield to make a survey of a random sample of different types of practice in England and Wales and Scotland. His own account of the results of this appears below. The results of the Postal Inquiry answered by nearly 13,000 general-practitioner principals and the Committee's Report appear in a specially enlarged number of this week's Supplement.

A FIELD SURVEY OF GENERAL PRACTICE, 1951-2

BY

STEPHEN J. HADFIELD, M.A., M.B., B.Chir.

Assistant Secretary, British Medical Association

This is a report of a survey of general practice carried out between February, 1951, and March, 1952. I wish to emphasize, in anticipation of a possible objection that parts of the report are one-sided, that my information was obtained entirely in general practices and from general practitioners. Some of the general practitioners interviewed criticized other fields of practice, and these criticisms are set down in the report, but it was not within my terms of reference to seek answers to them from practitioners in the fields concerned.

The approach to the survey was critical in the hope that the discovery and assessment of shortcomings, faults, and difficulties might lead to action which would eliminate them. Consequently these matters are given considerable emphasis. Where this touches the adequacy or otherwise of the practitioners seen, a final assessment is given towards the end of the report (p. 705), and this should offset any inaccurate impression given in the remainder of the text.

Since the report was completed certain important administrative changes in general practice in the National Health Service have occurred as a result of the Danckwerts award, including the implementation of the Spens recommendations for the remuneration of general practitioners. They should be borne in mind when reading certain passages of the report, which have been left in their original form. Their retention will serve to show how necessary were the changes and will perhaps encourage further improvements in the interest of both patient and doctor.

INTRODUCTORY

A Field Survey of General Practice

The field survey was designed to cover 200 general-practitioner principals in England, Scotland, and Wales. This number was chosen, first, as being large enough to

give a representative picture and to ensure that all types of practice would be visited, and, secondly, as being sufficiently small to be surveyed within a reasonable time by one investigator. The practices seen included various types of town practice, rural practices remote and otherwise, a Highland practice, and a practice on one of the islands off the west coast of Scotland. The number selected was such as to make the survey last over one year, so that practices were seen, so to speak, at all states of the tide.

The purpose of the survey was to obtain an objective picture of the varieties of general practice existing at the current time and how they were being conducted, and to obtain information upon which the types and magnitude of the difficulties existing could be assessed. The method of survey adopted was for the investigator to spend the best part of one normal day with each of the practitioners selected.

I sat in the surgery through one surgery session (in some instances more than one) and then accompanied the practitioner on his normal round. The practitioner's views were obtained during the many opportunities for conversation that occurred during the day.

Although I did not suggest it, approximately half of the practitioners invited me to accompany them into the houses they visited. It was interesting to note that, on the whole, neither in their homes nor in the surgery did patients seem to be in the least upset by the presence of another doctor—in fact, after a brief introduction the patient seemed to take no further interest in my presence. Neither did the patient object when the practitioner, as happened in a number of instances, invited me to examine the patient with him and to join in the consultation.

In ten instances the doctor made it a condition of my visiting him that I would not be present at consultations. My visits to these doctors were thus somewhat shorn

of their objectivity, though in some instances I was taken into the patients' houses instead. The reason usually given was that the doctor "could not submit himself or his patients to such an embarrassing situation as would arise from having a third person present." In one case the practice had changed hands three times in the space of four or five years. This practitioner, naturally, was unwilling to agree to anything that might give rise to further rumours which would seriously impede the rehabilitation of the practice.

In view of this diffidence among a few it was surprising that such a large proportion consented to my presence. It was indeed laudable, for I am prepared to believe that some overcame a natural diffidence in the interests of the survey.

The doctors themselves seemed quite unperturbed by my presence, although one or two of them did tell me afterwards that they had not felt entirely at ease. I always expressed my readiness to leave if the patient clearly preferred it. Such a need, however, seldom arose. Five practitioners had no surgery sessions for me to attend.

Method of Selecting the Practitioners to be Visited

As it was considered essential to visit practitioners in all districts the country was divided into 20 regions. For convenience, this was effected by taking the 19 regional hospital board areas, the twentieth area being made by taking separately the geographical area covered by the Metropolitan Branch of the British Medical Association.

Acting upon the suggestion of Professor Bradford Hill, the names of all principals in general practice in England, Scotland, and Wales were placed in alphabetical order and then sorted into the 20 areas, according to their addresses. Starting from a drawn number, every 64th name was taken, working through from region 1 to region 20. The selection was continued through a list of practitioners in entirely private practice; this gave a random selection of 300 names. The list was then reduced to 200 by casting aside every third name. This, incidentally, created a reserve list of 100 names, one reserve name being specifically allotted to every two practitioners on the main list. The 200 on the main list were the ones to be visited. Only in case of death, retirement from practice, removal from the area, or absence from the practice for the period of the survey was a substitute visited and included in the results.

Where there was refusal to allow a visit no substitute was visited. This happened in six cases, and consequently the number visited fell short of the 200. There being only one substitute for each two doctors, it was found on three occasions that both of the pair on the main list were excluded for reasons other than refusal; thus for one of the pair there was no substitute. In three instances where one was required a substitute was found not to be available. The number visited was further reduced by these factors to 188.

A few doctors who originally refused were subsequently persuaded to change their minds, and when visited were found to be at least as co-operative as the others. There were two refusals with no reason given. Reasons for other refusals were as follows: "That it is a misguided policy to imply publicly that an observer is needed to unearth the significant facts; that it is the

particular attitude of mind of each practitioner himself that is important, not the opinion of an observer." This practitioner added that the presence of an observer would be an embarrassment to himself and to many of his patients, and that the whole atmosphere during the visit would be artificial. Another said he disagreed with the method of obtaining evidence and that he hated anyone sitting in the surgery with him. A third was shortly leaving his practice and thought that there was no point in trying to "tinker with the present set-up, which is founded on a false philosophy at variance with Christianity."

By this method of selection visits were paid from Ross-shire to Cornwall and from Caernarvonshire to Kent, and included a large number of industrial, cathedral, and seaside towns, and a wide variety of rural areas. Some of the practices were large partnerships with full lists, while one or two were very small indeed. The majority of practices varied widely between these two extremes.

The programme of visits was arranged so that as many areas as possible were visited more than once, at different seasons. For example, seaside towns were visited both in and out of season; big industrial and country practices were seen both in summer and in winter. The same practice was never visited twice, as time was insufficient; but, generally speaking, each type of practice was seen at different times of the year. The actual arrangement of the journeys, the choice of where to go next, was haphazard and made by me as I worked through the list. So far as possible I tried to make several visits on each long journey.

It was found possible to visit four doctors, sometimes five, in most weeks. Saturdays and Sundays were not used for visits. After seeing nine doctors in a pilot or preliminary "run," the survey proper was begun on February 6, 1951, and the last practitioner was visited on March 4, 1952.

In part the survey was designed to show to what extent the tenets in the Cohen Report were being followed and also to find out as much as possible about general practice in the country.

Facts and opinions were sought on the same subjects in each practice. So far as possible I categorized the answers obtained in order to facilitate analysis. This categorizing was necessarily vague, but I found it possible to place the answers in the correct category without much difficulty.

In this report the large majority of opinions expressed are those of the practitioners themselves. Some are the conclusions come to by me as a direct result of my observations. Where there is expressed what might be called a personal opinion this is clearly indicated.

I wish to place on record my grateful thanks to all those practitioners whom I was privileged to visit for the helpful way in which they enabled me to carry out my task. In addition I would like to thank most warmly those doctors' wives who gave me hospitality during my visits.

Further, I am grateful to the Council of the Association for making it possible for me to have the experience of undertaking this Survey, to the Secretary and my colleagues on the staff of the Association for their assumption of my duties during my absence, and to the clerical staff for their invaluable help.

The Average Practitioner, 1951-2

There are so many variations in general practice that it is perhaps difficult to draw a picture of the average general practitioner. Nevertheless, the attempt may be worth while. Evidence that wide variations do exist in many directions will be found throughout the whole of the report.

The average doctor lives in a house in the area in which his practice is situated. He has his surgery premises either in his house or in a special wing built on, probably by his predecessor, or he may have a lock-up surgery, with or without a caretaker, in a busier street near by. He may share this with a partner or partners, though he usually has his own consulting-room.

His list will be in the neighbourhood of 2,500 in the town or 1,500 in the country. In addition he has a handful of private patients. He takes the administration and organization of his practice in his stride and does not find that this side of his activities worries him much. Unless he is an extreme individualist he will prefer to have a secretary-receptionist to help him with correspondence, with finding and filing patients' record cards and reports, and with the telephone. He may not be able to have such assistance owing to insufficient income or to lack of accommodation, the latter often being due to the impossibility of obtaining suitable premises or of converting his present place.

In any case, his wife has a considerable burden to bear. Over and above the abnormal strains on his household that a doctor's calling occasions, and in the absence of suitable domestic help, she has to see that the needs of the patient are served. The telephone and the door-bell must be constantly answered. Such is the difficult situation in which many a doctor's wife is placed that she cannot embark upon her morning's shopping without considerable forethought and organization. To go out with her husband is a rarity. Even a visit to the cinema or bridge club requires careful planning, if it is possible at all.

The average doctor will usually be able to overcome this to some extent, and also, outside the busy part of the winter, to ensure himself a very little leisure, by arranging a rota system of duties for the evenings or for half-days. Apart from this he will regard himself as more or less permanently on duty. He will have encouraged his patients to send their messages to him before he sets out on his morning round, but there always remains a nucleus of patients who are unaware or unheeding of the need to assist the doctor in this way.

The average doctor, while telling you that he is quite prepared to deal with any emergencies that come along, would be much happier in his practice, and would probably carry it out to the better satisfaction of himself and his patients, if only he could purge his list of this hard core of inconsiderate trouble-makers. He is genuinely fond of the majority of his patients and is anxious to do his best for them, but he will be the first to admit that there are times when the accumulation of trivial or unreasonable demands at the end of a tiring day may well impair this feeling.

Between 8 and 9 o'clock in the morning he will be taking his breakfast and answering telephone calls for visits. He will be in his surgery promptly at 9, and will see patients until, say, 10.30. This is an average time, during which he will see up to 25 patients. There will

be a bit of everything most days. Perhaps 20 of the patients will have minor ailments or come for follow-up, or be calling merely for a certificate. The other five may be more interesting from the clinical point of view and need more attention. Thus he may spend 15 minutes on one patient and then quite properly deal with the needs of five or six others during the next 15 minutes.

When the patient enters the doctor may need to ask the name, especially if the patient has not recently been under treatment. He will get out the record card, if he has no secretary to do it for him in advance. He will then note the patient's complaint and ask what supplementary questions he may consider necessary. He will not as a rule follow the method of approach which is taught to the medical student, except where he suspects there is something more than a minor ailment to deal with. Of necessity he has learnt to short-cut the detailed method. His knowledge of the patient gives him a start. If he has treated the patient year after year he will know just how detailed his examination need be.

The morning surgery finished, he will make out his visiting-list, with final adjustments to include new calls that have come in. He arranges his round geographically so far as is possible. This is sometimes conditioned by messages which have about them a more urgent ring, or by visits to specially ill patients—for example, the revisiting of a patient to whom he was called during the night.

The possibility, or indeed the likelihood, of his day being disrupted by a midwifery case, an accident, or some other emergency will cause him to tell his household or his secretary in what order he proposes to visit his patients. Thus there is at least some chance that he may be "got" in an emergency. When he and all his partners are out visiting, his wife may quite likely receive an "urgent" message later in the morning. On being told that all the doctors are out visiting but that she will get a doctor to call as quickly as she can, the inquirer may exclaim, "There must be a doctor there: I don't believe it. . . . Send a doctor at once or I will report you." Needless to say such messages are rarely as urgent as they sound.

Doctors vary greatly in the time they take over their visits, quite apart from the requirements of the case or the volubility of the patient. Most doctors, in the towns and in the country, will have 15 to 30 visits a day to pay during winter months, when there is no epidemic raging. In the summer the number may be down to about half that of the winter. In the country a higher proportion of the work is done in visiting, while in the town the majority of patients are seen in the surgery—in some practices the great majority. Distance and accessibility for the patient are the factors here. So that, while on the average the numbers of visits paid are the same in both town and country, the country doctor needs more time for the same number of visits, but his surgery sessions are shorter. In a few town practices the visiting-lists are very high indeed, reaching the forties in quite ordinary times. Practices vary enormously, but these big visiting-lists are not within the average.

Nearly all practitioners told me that, since the N.H.S. began, surgery attendances have increased greatly but visiting-lists have, if anything, become smaller; also that late calls in the evening, many of them unnecessary, have increased, while the actual night calls, those which involve rising from bed, have dropped slightly.

The practitioner has perhaps six hours between morning and evening surgery in which to get his calls done, have his lunch and tea, and travel, the average distance being 15 to 20 miles a day. He will get in and out of his car, say, 25 times a day: if he has many gates to open it will be many more. Thus he can usually manage to see about five patients an hour. Rather, it should be said, he can visit five houses an hour. In some houses he is asked to see two, three, or even four patients where he was expecting to see one. This is a development for which the N.H.S. is responsible. I witnessed this in many a home, just as I also saw much of the multiple consultation in the surgery. These things are very prevalent indeed.

If the various members of the family are paraded into the surgery their cases must be gone into one by one, and more often than not they are trivial in the extreme. When prescriptions are requested for absent members of the family it is often easier for the doctor faced with a waiting-room queue to give a prescription than to enter into an argument about the patient having to come to the surgery in person.

There is nowadays little of the old custom of turning the doctor's visit into a social occasion. There are many offers of hospitality, but there is little time for the prolonged chat. Days vary, but often the end of the visiting-list seems far off and there is anxiety whether the list can be finished in time. It is rarely that a visit to a house lasts more than 10 minutes, and many need not be so long. Some practitioners work much more quickly than others—for example, on the day I was there one visited 27 houses, and drove 12 miles in doing so, in 130 minutes. Another visited 44 houses in 190 minutes. These are exceptional.

At lunch-time, which is normally not longer than half an hour, there may be telephone calls to be made to the hospital, to the district nurse, or to the chemist. A general practitioner's lunch "hour" is hardly ideal for the preservation of a good digestion.

The afternoon round follows the same pattern as the morning—that is, if no emergencies have intervened to upset the programme. If they have, the afternoon is almost certainly an anxious rush. The practitioner will usually make time for a cup of tea before starting his "6 p.m." surgery. Many start this at 5 or 5.30, for the patients are already there and the sooner it is started the sooner it is finished.

To have to pay a further visit or two after the evening surgery is common, though if there is a rota system with partners or colleagues the practitioner may have to do this only on certain days of the week. This is a great advantage, for he can then sit down quietly to his supper and face the evening with tranquillity.

If he has not this freedom he may well have to turn out again after supper. In the winter he usually has to forgo his half-day; there is too much work to be done. Yet the work varies. Except in epidemic times there is seldom a period of high pressure for more than three weeks at a time. Just as the general practitioner is beginning to think to himself that the strain will never end there comes a sudden lightening of the burden. This is sometimes all too short, but is nevertheless welcome. There are, of course, some practices that seem always to be hard-pressed. Summer and winter the lists of visits in these practices and the queues in the surgery are long and there seems to be no let-up. Not in these

practices can one partner go away and leave the other to carry on. He must get a locum. Another practice, much the same on paper, will produce about half the pressure of work. I have seen both sorts in the same town. This must have some relation to the personality of the particular doctor, though I have been unable to define clearly the factors responsible for the difference. Some areas of the country seem to produce more illness or more general-practitioner attendances than others. The impression I gained was that this is due, in certain districts, to an increased incidence of respiratory and rheumatic diseases.

(A) THE RANGE OF GENERAL PRACTICE

Continuity of Treatment

Most practitioners are anxious to keep in as close touch as possible with the progress of the patient, even though the responsibility for the treatment has passed temporarily out of their hands into those of the hospital out-patient and in-patient department. They like to be ready to take over the treatment, convalescence, and rehabilitation after the patient's discharge from specialist treatment. A smooth transference of responsibility is more likely when general practitioners are working with the hospital and where the liaison with the hospital staff is good.

Another aspect is the degree to which a patient is exclusively cared for by one general practitioner for either one or all successive illnesses.

Obviously, in the single-handed practice the patient is exclusively looked after by one doctor. The exception is where a single-handed general practitioner has an assistant and uses him in such a way as to depart from the "one illness, one doctor" principle.

In some partnerships responsibility is divided even in the care of an individual illness. Patients have no means of knowing which of the partners they will see when they call at the surgery. There are no definite times when Dr. A or Dr. B will certainly be present. Patients are seen by whoever is there. The lists of visits to be paid that day are pooled and divided up among the partners in a manner suited to their convenience. This may be on a geographical basis or just haphazard, bearing no relation to which doctor has previously visited the patient, either in the current or in the previous illness. The latter method is used by 9% of practitioners. It is defended on the grounds of necessity in order to make the visiting-lists economical of time and thus allow the work to be dealt with. The point is also made that the patient may well get better treatment by having more than one opinion. A number of patients prefer such an arrangement for this reason. In addition, the doctors in a partnership get to know all the patients and to gain their confidence. This is considered to be a great advantage in relation to emergency calls where a rota system is in operation.

There exist all shades of variation in this matter, the general tendency, outside the strictly personal practice, being to take the middle course, in which, on the whole, one doctor continues to attend any one patient for the duration of any one illness. Then there are those doctors who, from my own observation, I feel confident share the knowledge of all the patients so thoroughly that the method approximates to a working together on the case. There is a world of difference between the partnership that starts the day's work with, "I'll do the

west town and the High Street and you do the housing estate," on the one hand, and the partnership of two whose day starts with, "Will you go and see Jim Budd to-day and see what you think? I found some creps yesterday," on the other.

It is stated by some doctors that the majority of patients get used to being seen by more than one doctor and do not mind. I have no doubt, from my own observations, that this is true of a number of patients.

I saw a small number of doctors who did not know the names of most of the patients who came to the surgery and gave no signs of having had any previous acquaintance with them. Although some doctors describe themselves as "bad at names" I found this complete ignorance was not so noticeable in the practices where patients kept to the same doctor.

In one of the best practices that I saw the work has so increased as to make it necessary to depart from the previously existing state of affairs in which the patient kept to one doctor. In another practice the two partners tended to change the visits round, but were finding that the patients seemed to want the practice to develop into a more personal one. I saw one practice run on group-practice lines. The doctor whom I met kept surgical cases to himself. When he saw a medical case he would hand it over for further treatment to his colleague.

In many cases I found that the partners had a fair knowledge of all the patients in the practice. This seemed more common in the smaller practices. This leads me to another point. In the nature of things, and because the terrain demands it, most country practices are, on the whole, smaller. Thus it is easier for the country practitioner to know the patients of his partner than it is for the town practitioner who has a full list. Also, of course, it is so much more important to be able to arrange visits geographically in the country. In the winter it is often essential in order to get the work done. Views vary concerning the desirability of changing patients or doctors during the course of an illness and whether or not the patients lose anything by it.

In considering this item any treatment by a partner in an emergency is, of course, not taken into account.

Health Education and Preventive Medicine

Almost all general practitioners give inoculations and vaccinations, and when opportunities occur encourage mothers to bring their children for immunization. A small proportion expressly advise patients to take their children to the clinic, for they say they feel it is far better for the child to receive a prick at the hands of a stranger than to be estranged from the family doctor because he has hurt him. One doctor said he thought it created a neurosis. Some said they preferred the clinics to do the injections because it saved them work.

Nearly all the practitioners visited give helpful advice on positive health and preventive medicine when asked by the patient. Some spoke of lack of time. The majority confine their activities in this field to taking what opportunities present in individual consultations and, with some, at antenatal clinics arranged by them in their own surgeries. Nine per cent. are enthusiasts and spend much time in educating the public in matters of health. A few gave me the impression that they

could not be bothered with health education. Nearly all the remainder feel that they are too busy treating disease to preach its prevention. In many cases this is undoubtedly true.

Patients are not, as a rule, receptive to positive instruction; they regard it as preaching and treat it with suspicion. I often noticed that when the doctor's remarks veered from the symptoms and the pills to such things as open windows, suitable clothing, and other precautions a curious blank look came over their faces. This applies especially to mothers of children.

Treatment of the Patient as an Individual

The majority of doctors are of course concerned to assess and to treat the symptoms of which the patient complains. They also show, by questions and conversation, a knowledge of or an interest in the family and occupational background of the patient. This interest in the patient as an individual was particularly conspicuous in about a quarter of the doctors interviewed. Some of these are interested especially in the psychological approach. A few isolated practitioners (6%) seem to have no interest beyond the actual symptoms complained of. In one case at least I felt that the practitioner regarded his patients as something of a nuisance.

Diagnosis

I saw a wide variety of diagnostic methods. Most of the doctors (93%) whom I saw at work carried out some sort of examination in some cases: 69% could be definitely classified, on the evidence before me, as leaving no doubt that all patients received what examination was necessary.

I kept constantly in mind that the extent of the examination needed in any case is conditioned by the fact that doctors know the patients and also may have examined them quite recently.

Some of the senior practitioners, though undertaking little in the way of examination, have obviously developed an instinct or sixth sense. This, coupled with a background of long experience, enables them to use a minimum of effort and yet leave one with the feeling that they are unlikely to miss any serious diagnosis. I found the margin a narrow one between such practitioners and those who, through over-confidence, tended too often to put their trust in spot diagnosis. Among these latter were men who expressed to me their feeling of pride in the way they were doing their work.

Among a small proportion (7%) of both young and old there is a need for revision of the methods of diagnosis they use. There is a need for constant vigilance on their part to determine for themselves whether in fact they are doing their duty by their patients in this matter of clinical examination.

It would be easy to cite a few examples where no attempt was made at examination when it was clearly indicated. To do so would create an unfair impression while ignoring the countless occasions when I witnessed thorough examinations. Suffice it to say that I did see a small number of practitioners whose standard of examination was in the danger zone.

The remainder (24%) vary over a fairly wide range. Some of these seem ready now and again to take a chance, and some of them are forced into this position by the excessive demands upon their services. Yet I

observed that some of the busiest men are the most thorough in examining their patients.

I was told by one doctor (and a similar attitude was noted in several others) that some forms of examination—for example, per vaginam—are not convenient to ordinary general practice conditions. These were left for the hospital to do. Another examines where necessary but considers that surgery conditions prevent its being done easily. Facilities for examination—for example, examination couch—were absent in 11 surgeries. Minor reorganization of the consulting-room or of arrangements for surgery attendances would have made it possible to conduct any necessary examination.

A few doctors have solved this problem by making appointments for "special examinations," as they are called, or by arranging to call at the patient's house. Such arrangements meet with, at any rate, some degree of approval from most. But it may sometimes be forgotten that the patient often comes for such an examination after much marshalling of courage and in the fear occasioned by, say, a mammary lump or an irregular menstruation. The ideal, surely, is for the practitioner to have his premises so arranged that the patient can receive the necessary examination at the first visit and not be sent away with anxiety mounting and having to muster courage all over again. Several times I thought I detected a look of disappointment from this cause.

It was interesting to note how rarely are inspection and percussion used in examining the chest, even among doctors who attain a reasonably high standard of examination in other ways. I was surprised at the prevalence of the method of examining the abdomen through the clothes and with the patient standing. This was adopted sometimes in the absence of an examination couch and sometimes under pressure of work, no doubt backed by a knowledge born of experience as to the time taken by the really well-corseted woman or bewaistcoated man to remove enough garments to permit of a reasonable clinical examination according to the textbooks.

A small percentage of practitioners do not seem to examine their patients except as a rarity. It must be emphasized that their number is very small. Some general practitioners have got into the habit of hurrying through their work. Whereas they may be busy at times, and undoubtedly are, they have developed the habit of not examining patients even when they are not unduly pressed.

A certain amount of spot diagnosis is inevitable in a busy practice, but, as mentioned before, some rely on it overmuch. I saw one doctor in particular try to deal with over a hundred patients in a day. This made thorough examination impossible—for example, it was not possible for him to give a thorough examination of the chest in patients presenting anew with cough.

Lest this account of the shortcomings of a few should lead the reader to conclude that the average practitioner does not examine his patients adequately, it should be stated once again that the majority of the practitioners whom I saw left me in no doubt that all their patients received whatever examination was necessary.

Treatment

Over 90% of the practitioners that I saw are undoubtedly interested and careful in the treatment of their patients. They give the necessary advice, super-

vised rehabilitation, prescribe carefully, and do dressings and emergency treatment. Not for them the mere hurried writing of prescriptions that I witnessed among a few.

About two in every five are anxious to undertake, and do undertake, as much of treatment as comes within what has been recognized as the normal scope of general practice.

I ascertained whether or not the practitioners visited undertake minor surgery. The majority (53%) do not or do only a very little. It is noticeable that in the towns only 27% of the general practitioners do minor surgery, whereas in the country 60% do. Cottage hospitals no doubt play their part in this, but some of the country doctors seen were miles from a hospital. Obviously in the towns the proximity of a general hospital is an important deciding factor.

Some doctors declare that it is preferable, in order to ensure asepsis and the best technique, for minor operations, varicose vein injections, hydrocele tapping, and the like to be performed in hospital. The reasons most often given for not doing minor surgery were, however, lack of time (by no means always borne out by the day's work witnessed) and the absence of a special fee.

Two or three of the doctors seen give physiotherapy in the form of light treatment.

Information to Specialists

An overwhelming majority of practitioners send letters to consultants when referring patients. I sometimes saw the letters. They vary in length; most are confined to a statement of facts and a request for an opinion.

Most consultants or hospital authorities will not accept a patient unless there is an introductory note from the general practitioner. Even so, I noticed that this, of all the questions asked, was normally answered in an affirmative that was almost indignant.

One doctor had been told that he writes too much. Another criticizes his partners for the poor notes they write. I saw three who wrote very short and scrappy notes, one almost impossible to read. Another could not be bothered with a proper letter, for, he said, the consultant could find out for himself. He is one of the few who send a visiting-card with either their diagnosis or the main symptom written thereon.

One doctor says he attaches "great importance to the letter in the patient's interest." He regards it as a passport to the consultant, which takes away something of the patient's embarrassment and fear. A woman doctor expresses herself succinctly thus: "The better the letter I send the better the reply I expect, and get."

The forms used by hospitals for general practitioners to make out-patient appointments interested me greatly; some serve as the letter to the consultant as well. There are several variants. One that is satisfactory to some general practitioners is a letter-card, prepaid to the hospital appointments clerk, which is simple for the practitioner and preserves professional secrecy by reserving the inside sealed part to be used for the doctor's letter. The information required by the clerk is on the outside, and the letter is opened only by the consultant himself. The letters and cards used by many hospitals have not incorporated this desirable feature, so that it is possible for any clinical notes to be read by the lay clerks.

Administration

Ninety per cent. of practitioners seem to take the administrative side of their practices in their stride. Some of them complain of the tedium of paper work, but they keep on top of it either by the exercise of a natural efficiency or by employing a secretary.

I saw only five doctors whose enthusiasm for the administrative side of practice was such that it was almost a hobby. There were five who disliked it intensely and were evidently much harassed by it.

A very large number of the practitioners visited complained bitterly of the volume of advertising matter which arrives daily by post. They wonder by how much this excessive advertising increases the nation's drug bill.

Miscellaneous Duties

I found that 13% of general practitioners combine with their practices considerable activity outside the day-to-day care of patients. The single-handed and the partners seem to be equal in undertaking such pursuits. With partnerships the covering for attendance at medical boards—often some distance away—or at hospital sessions is much easier.

Sixty-nine per cent. of general practitioners undertake what must be an average amount of work under this heading, the commonest forms being life assurance examinations and dental anaesthetics. Occasional attendance at schools and factories was noted also with some frequency.

About one practitioner in six, usually by his own choice, undertakes nothing, or almost nothing, beyond the general care of his patients.

I formed the view that the variety afforded by a modicum of extra tasks is of value to the general practitioner. The man who does none seems less contented, and more affected by what has become the humdrum nature of the task. There is an optimum degree of development of miscellaneous duties, consistent with the conduct of a fair-sized practice and with the preservation of some degree of continuity of treatment of patients. I think that the practices of some of those who do a great deal outside the day-to-day care of patients are inclined to lose something of the individual touch.

Non-Medical Advice

Inquiries under this heading were not quite accurately so named. There is much in the way of personal and family advice that a general practitioner can and does give that is partly medical. It often has a bearing on the medical condition, more particularly, perhaps, in psychosomatic medicine. So that I directed my inquiries to finding out to what extent the general practitioner's advice is sought on matters not purely and entirely clinical; to what extent does the general practitioner fill the role of guide, philosopher, and friend on the non-medical and quasi-medical stage.

I find that about nine out of every ten regard this as a part of general practice. They give advice or help when it is asked for by the patient, or sometimes when it seems to be necessary. It may vary from writing letters for the illiterate to advising about a will. These are two examples that I saw in my survey. Of the nine, one general practitioner will be specially active on the

more social side of his patient's affairs, including activities which properly come into the field of social medicine.

The remaining practitioners (14%) do nothing in this way. Some have too recently started in practice or are still young enough to be regarded as being without worldly wisdom. Others avoid giving "non-medical" advice, saying that it is nothing to do with a doctor, that much of it is the job of a lawyer, that doctors have been too dogmatic in the past and have talked and advised upon matters of which they know next to nothing. Others say that they or their patients have found themselves in difficulties as a result of inept advice; now they avoid a repetition.

Special Interests

Inquiries regarding special interests and the possibility of applying them in general practice were not fruitful: 51% of practitioners have some particular bent, sometimes leaning rather definitely towards a specialty; 65% of these find at least some scope for their interest.

One says he has no scope to pursue his interest—blood counts—because he is not paid for it. Those interested in chests and dermatology complained of the difficulty of obtaining radiological diagnosis and treatment. Time was the factor most often mentioned. The interests covered most of the field of medicine and surgery.

The Scope of Practice

Recent Advances in Medicine

Of those who have been in practice long enough to judge, all but 30% say that the scope of practice has been increased by recent advances in medicine. Nearly all mention particularly the treatment of pneumonia with penicillin and the use of the sulphonamide drugs. One practitioner remarks that recurrences and relapses of pneumonia occur more frequently; thus the work is not lessened as much as might be expected.

Approximately 35% contend that the work has increased from this cause, one saying that this is because he prefers to give all injections himself. On the other hand, another doctor observes that he now has fewer visits with oxygen cylinders to pneumonic patients.

Three doctors say that their scope has been diminished by recent advances in medicine. I did not succeed in getting any very satisfactory explanation for this opinion. One said that there is now so much more that can be done for a patient by the general practitioner if only we had fully equipped health centres and beds.

Increasing Specialization

Sixty-six per cent. are unaware of any effect of increasing specialization on the scope and work of practice. The small number (9%) who feel there is an increase in scope due to this cause are of the opinion that more can now be done for patients by referral to consultants whose interests lie in a smaller and more detailed field. I believe that in giving this opinion they really intend the credit to go to the advances in medicine rather than to the fact that medicine is becoming more fragmented.

One-fifth find their scope diminished by an increased demand by patients for reference to specialists and to specialized clinics. There are, they say, so many different consultants nowadays that there is little of interest left for the general practitioner to do. Also, hospital

work has been taken away in many instances and the general practitioner feels that he is not trusted to do things for his patient. He has to think much more carefully when deciding to whom he should refer the patient. Indeed, he is at a loss sometimes to determine who is, in fact, the proper specialist for the particular case.

The most telling cry of those who find the scope of practice lessened by increasing specialization is that of lack of flexibility of hospital beds. Beds in some hospitals are allotted in smaller and smaller batches to an ever-growing list of "ultra-specialists," thus reducing the number of general beds available for "ordinary" cases.

Co-operation of Public Health Services

Only 4% of practitioners have found that the scope of their practices has benefited by changes in or increased co-operation by the public health service since the introduction of the N.H.S. A few mention the better arrangements made by the medical officer of health for obtaining home helps, entry to convalescent homes, or invalid chairs. One speaks of the assistance he has received in mental and nervous cases. There is appreciation where pathological facilities are provided by the public health laboratory.

A few find their scope diminished through the treatment of children by school medical officers without the general practitioners being informed. Others say that mothers are encouraged by the public health clinics to have their babies in hospital rather than at home under the care of the general practitioner. In one area—except in serious emergencies—patients are not admitted to the city maternity hospital unless they have attended the antenatal clinic. The general practitioner is powerless to arrange an admission.

Some clinics are said to have encroached considerably on general practice. Patients are treated partially at clinics, and then, when they have to take to bed, the general practitioner is called in and knows nothing of what has gone before. One practitioner emphatically stated that, whereas he formerly regarded the public health service as an encroachment on his practice, now that it makes no financial difference he is willing for them to share the burden of work. There are others whose remarks suggest a like view.

The points mentioned above are mostly of detail. The overwhelming majority have found no effect on their practices of any changes in the public health service or of increased co-operation.

It seems appropriate here to introduce the subject of relations between the general practitioner and the public health medical officers. There is little sign that the introduction of the N.H.S. has brought about any change in the relationship between the general practitioner and the officers in the public health service. Forty per cent. report little or no contact with the service, and 41% that relations are satisfactory. The word "satisfactory" is not used in the sense that perfect or near-perfect liaison exists between the two branches of the profession. By so describing the situation many of the doctors merely mean that they have no complaint and that on the rare occasions when they have asked something of the medical officer of health they have got it. Of the remainder 9% consider their relations to be unsatisfactory.

On the "satisfactory" side I heard how general practitioners had been actively helped by the medical officer of health in handling dysentery outbreaks. About one-half say the school medical officers now write to general practitioners and give them the opportunity of arranging for consultants' opinions when required, instead of doing it themselves without passing on the information. In a few cases improved relations are attributed to a change of medical officer of health, in one to the fact that he is now full-time instead of one of the local general practitioners. As an example of the other side of the picture, a general practitioner in a large city complained that the medical officer of health had announced in a newspaper that he was in close touch with the general practitioners and that all was prepared in the event of an epidemic breaking out. The general practitioner states that no such contact in fact exists. Then, again, while the general practitioner was strenuously overworking in the influenza epidemic of January, 1951, he was disgusted to read a statement by the medical officer of health that there was no epidemic in the city.

One general practitioner, in the middle-age group, gave me the impression that he knows nothing about the public health service. He reported that the sanitary inspector was good for disinfection, and that was all he knew. One complains that his medical officer of health is interested only in vaccination returns, while another says that the general practitioners in the area have found it necessary, when anything was required of the medical officer of health, to band together and approach him as a deputation.

I heard a good deal of criticism of the clinics and the medical officers working in them. These latter are said to exercise insufficient care when advising patients, and mothers, to go home and call in the general practitioner. Patients having some slight disability or something that calls for no more than an ordinary message to the general practitioner are given the impression that they must ask the doctor "to come at once." It is complained that there is little appreciation by the doctors in the clinics of how disrupting such unnecessarily urgent messages can be to a general practitioner's work.

The explanation may well be that the clinic doctors are unaware of how liable the patient is to be misled by what is said, or to exaggerate the seriousness of a complaint or illness, especially of their children, and do not word their advice accordingly.

Quite often I heard criticism of the work of the clinic doctors. This greatly disturbs the general practitioner, especially when he is unaware that the patient is under treatment at all. Some complain that the clinics treat the patients up to a point and then send them to their own doctor to "clear up the mess." Other general practitioners say that they get many notes such as "Rash: please treat," or "Temp.: please treat." Some feel that the clinic doctors should be allowed to prescribe some of the simpler remedies under the N.H.S. Others resent the fact that another doctor, unknown to them, should be treating their patients. They object to being sent for when the child, who has been for several days under treatment for a running ear at the clinic, has to be kept at home on account of a temperature. The general practitioner knows nothing of what has gone before. Complaints on these lines were

commonly met with. I think they spell only one thing—a deplorable lack of contact between the two branches of the profession.

Some do not mind a certain amount of encroachment by the clinics, because they are only too glad to shed part of the burden on someone else, and they readily admit it. But the majority prefer to treat their patients themselves.

Many feel that the clinics are not necessary. One says that the public health service is redundant so far as individual medicine is concerned. One medical officer of health had told a general practitioner that he was not interested in individuals. Some feel that the medical officers of health overlook the general practitioner's circumstances; for instance, when they send a request to him to vaccinate a child without sending a parallel notification to the parents to instruct them to get in touch with the doctor.

I found some confusion of thought among a few general practitioners about the responsibilities of the public health service. For instance, some seemed still to think that chest physicians were responsible to the medical officer of health and blamed him for situations which were not within his control. A general practitioner sent a case to the chest physician. He heard nothing more until he discovered later that the district nurse was giving streptomycin and P.A.S. He believed that the public health service was at fault in allowing this to happen without his being informed. I had several complaints of the existence of that mystic attribute "the official mind." There were complaints of delay, such as one of 48 hours in seeing a case of pediculosis. The general practitioner finds it difficult to understand such delays.

Undoubtedly the best relations with the public health service are found where the general practitioner himself is doing part-time work in a clinic in that service. It has the double advantage of his getting to know the public health medical officers, and of his being able to make them see his point of view and appreciate some of the important points of general practice.

Elsewhere, and this covers most places, the general-practitioner service and the public health service are miles apart, with the result that both are becoming less effective. General practice is so wide a field that it can get along without the clinic side of the public health service. This is not to say that it would not benefit from closer co-operation.

From my observations I believe that the clinical side of public health work will not reach maximum usefulness unless and until it is brought much more closely into contact with general practice. It should be at least as closely allied to general practice as is the district nursing service.

It has been pointed out that the information required by public health medical officers for the performance of their duties is possessed by the general practitioner. Often there is a barrier between the two branches which can be made less formidable only by the co-operation of the medical officers of health on the one side and, on the other, by the general practitioner overcoming his existing resentment of the public health service, which is largely due to past errors and misunderstanding.

The medical officer of health needs the good will of the general practitioner, and it is necessary for him and his assistants to set out to obtain it. The general

practitioner needs to understand, too, that the public health service can mean co-operation and help instead of duplication and intervention.

During my investigation I found almost no evidence to suggest an enlightened attempt, either by the public health medical officers or by the general practitioners, to co-ordinate the public health service and the general-practitioner service.

Public Education in Health

"Our Medical Correspondent" has done much harm: "Press articles tend to panic patients": "They have too much 'little learning' and get confused"—these are some of the views expressed by 39% of the general practitioners, who find their patients made more sensitive, more "neurotic," by press articles and radio talks on health matters. Some describe it as "public education in disease." Increased surgery attendances, including demands for drugs mentioned, are spoken of as common consequences.

One doctor believes that many patients are discouraged from going to the doctor because they attach to some of the commonest of symptoms the fear of early cancer that has been instilled into them. Another feels that, although patients are more sensitive, further efforts at enlightenment are worth while. Another disapproves because patients' hopes of cure are raised too high. He feels that it is better for patient and doctor that the art of medicine should remain something of a mystery.

Most practitioners agree that this affects patients in different ways according to their type: 35% say it has no effect upon patients; and only 13% feel that as a result of public education in health patients are more sensible in their approach to their illness and to their doctor.

There is considerable divergence of opinion regarding the desirability and the effectiveness of these approaches to the public, which rather suggests a need for examination of some of the methods used. Perhaps also it suggests that there is a line of demarcation between the use of a medical article which does not rise above the suspicion of being a publicity stunt and the genuine attempt to improve the patient's well-being and state of mind by acquainting him with enough knowledge to understand something of disease processes and to achieve a sense of proportion in these matters.

Effect of N.H.S. on Scope of General Practice

Forty-five per cent. of practitioners applaud the fact that their scope in practice has been widened by the introduction of the N.H.S. Not all of these applaud, or even like, the N.H.S. itself; but on one point they are clear—that they can do more for their patients.

They speak with relief of being able to prescribe what the patient needs and to visit him as often as the condition requires, free from the inhibitive consideration of the patient's purse.

The opinion was expressed to me that, because of the costly new drugs and treatment essential to modern practice, the N.H.S. came in the nick of time. Most doctors are, from this point of view, glad of it.

It is doubtless true that, in the past, essential visits were always made and often not charged for, but the patient no longer needs to be anxious about the size of the doctor's bill. The general practitioner welcomes this. He welcomes also the removal of the financial bar to the calling in of a consultant to a consultation in the patient's home.

Other things, such as the stabilizing of a diabetic, can be obtained more easily. There are even a few practitioners who find that the waits for out-patient appointments are shorter.

A considerable number say that the summer and the winter work have evened out more; advances in medicine keep the winter work down while the "free" service keeps

the summer work up. Nearly all say that actual night calls are fewer but that the number of calls received after the practitioner has set out on his round, and also in the evening, is greatly increased.

The small number (15%) who say that the N.H.S. has diminished their scope proved rather a puzzle. For example, there are several who say that their scope is less because "I no longer do minor surgery," or "I send work to hospital now." Although the time factor (or "lack of time" factor) was quoted as the reason, I was unable to discern any marked difference in the demands made upon these practitioners and upon those who customarily undertake minor surgery. Some say their scope is diminished because they will not do minor surgery without special payment beyond the capitation fee, and these are not necessarily always the ones whose income has become smaller under the N.H.S.

Some who formerly did major surgery find their scope diminished by being no longer permitted to do it. Some have had other forms of hospital work taken away from them. The demands of the patient for hospital and specialist treatment are blamed for reducing the scope of practice. One doctor summed up these feelings by remarking that the N.H.S. tends to inhibit the desire to do more for the patient. Significantly the practitioner who made this remark showed no signs of any such inhibition.

About a quarter of the practitioners say that the N.H.S. has made no difference to the scope of their practices.

Midwifery

General practitioners seem to be divided into approximately equal thirds in their attitude to midwifery: one-third dislike midwifery, and have discontinued it entirely or are anxious to cut it down to a minimum; one-third are not very attracted to midwifery, but, feeling that it is a necessary part of the practice, do some; and one-third are keen on midwifery, regarding it as an essential part of general practice and endeavouring to do as much as possible. Attendance at the actual delivery is not, of course, obligatory, and a number of practitioners, even in this last category, do not find it necessary to attend the delivery in all cases.

Most of the doctors said that they see patients far more often than twice before the confinement, as is required by the regulations, many reverting to their pre-Service custom of monthly and, later, fortnightly examinations. Some find that not having to attend the delivery does, at least, enable them to cope with increased demands in other fields.

A vicious circle seems to be operating. There is a danger that the general practitioner will do less and less midwifery. Some fear that the practice of midwifery will be wrested out of his hands altogether. In most areas more mothers are having their babies in hospital. The reasons are economic and domestic as much as clinical. Then there is a tendency for midwives to deliver women at home in the absence of the general practitioner. He is less in demand because of the entry into hospitals, and in some areas because midwives and antenatal clinics encourage patients not to employ the general practitioner. Thus he is getting less and less experience in midwifery, which is building up the argument that he should not undertake it.

At present there is little pulling together in the matter. Misunderstandings occur and jealousies are aroused. The solution would seem to lie in the improvement of the local co-ordination between the general practitioner, the midwife, and the local authority, with the consultant and hospital service behind them ready to assist where necessary.

Relations with Midwives

Though nearly all practitioners are fairly well satisfied with their relations with midwives there are some indications of deterioration. So much seems to depend on the personality of the midwife and of the practitioner himself, but here and there I heard of lack of co-operation.

Suspensions were expressed to me that a B.B.A. ("Born before arrival") is occasionally deliberate; and there were a few complaints of the midwife failing to notify the general practitioner until the day after the labour.

Some midwives appear to resent the general practitioner's having anything to do with midwifery. One says that the midwife takes booked cases from him by persuading the patients not to attend at his surgery for antenatal examination.

A small proportion of general practitioners have expressed a fear that some midwives are anxious to supplant the general practitioner in the midwifery service. The general practitioner knows that he can complain when his instructions to be called to a case are flouted, as happens in some cases and with some midwives. But he is reluctant to do so, for he knows that the midwives are in a strong position; some are even suspected of favouring an opposition doctor.

Some general practitioners are anxious about this situation. They feel that now and again the midwife tries to take on too much clinically in her efforts to draw the practice of midwifery to herself, to the exclusion of the general practitioner.

One practitioner's real anxiety was that the tendency not to send for the doctor was developed to such an extent that he could not give his trainee assistant any experience in midwifery.

(B) PROFESSIONAL RELATIONSHIPS

Relations with Neighbouring General Practitioners

Most practitioners (70%) report that their relations with neighbouring practitioners are good, improved, or satisfactory. The word "satisfactory" is used broadly. It sometimes means no more than a wave of the hand as their cars pass, and an absence of any difference between them. As often as not there is no occasion for anything more than this to develop; or if occasions do present themselves the doctors are too busy or uninterested to turn them to good account.

The question on this aspect was asked largely because of a suggestion that the N.H.S. had encouraged competition for patients by unethical means. Where this was mentioned it was usually related to the period immediately before and after the introduction of the N.H.S., and is reported to have now disappeared. Here and there (about 5%) suggestions were made that unethical practices still continued.

What is more significant is the frequency with which single-handed practitioners, while pointing no finger of accusation, feel so unsure and suspicious of their colleagues that they are reluctant to co-operate with them, for instance, in the working of a rota. It is not a question of bad relations; it is a suspicion of one another hindering the establishment of good relations. Such single-handed doctors are perceptibly more anxious and less contented in their work, especially in the well-doctored areas. Where partnerships exist there is little anxiety on this score.

On the brighter side of the picture are reports of a decreasing tendency to unethical conduct, of the improvement of co-operation by formation of local general-practitioner associations, or regular (bimonthly) drawing-room meetings of groups of doctors, and of the formation of rotas. These are the result of attempts to overcome problems presented by the N.H.S. Improvement in relations has invariably resulted. The practitioners concerned are delighted and find the innovations valuable in every way.

A good example of improved relations exists in a small industrial town where the four doctors were in opposition to each other. The practitioner visited persuaded them all to join in partnership, the better to meet the problems introduced by the N.H.S. A sound and happy partnership had resulted. I saw a similar result where the practitioners had started with a rota system and developed it into a partnership.

The General Practitioner and the Consultants

Sixty-seven per cent. of practitioners declare that their relations with consultants have not altered since the inception of the N.H.S., and a large majority consider them to be fairly good, though often with some reservations.

The sort of reservation frequently made is, "So long as I can select my consultants all is well." Some consultants regard the general practitioner as a nobody; while one young general practitioner finds that the younger consultants are more approachable and more helpful. Many feel that consultants regard themselves as superior beings. One expressed well the feelings of several when he said that the younger consultant is on the defensive in order to conceal an inferiority complex. He does not like to acknowledge that the more experienced general practitioner knows a great deal. It is complained that the younger consultant has no knowledge of the general practitioner, his work, or how to treat him, and that a gap is forming partly because the consultant no longer depends upon the general practitioner for his living.

Many practitioners, while still able to maintain excellent relations with consultants they have known for many years, are frightened by the gap forming between them and the younger consultants. Deterioration is feared when the senior consultants are replaced by younger men who seem to feel superior to the general practitioner.

Some find improvement of relations arising out of the more frequent meetings with consultants on domiciliary visits. From several quarters, though, I heard complaints that consultants were so busy concentrating on other duties that the patients referred to them at hospital were seen, as often as not, by registrars and house officers. General practitioners feel some frustration when they are unable to get the opinion they want.

I tried to find out to what the general practitioners attribute any gap that is forming between these two branches of the profession.

Exclusiveness of Specialties

Only a small number (18%) feel that the increasing exclusiveness of specialties is causing a gap; 45% had no comment to make; while 37% were of the opinion that this was not a cause. One said that the general practitioner has to watch that the specialist does not miss things that are outside his field. For example, he sends a patient who is hoarse to hospital for investigation and learns he is admitted under the E.N.T. surgeon, laryngoscoped, and discharged as fit. On having the chest x-rayed a week later extensive lung disease is shown to be present. Though it may put the general practitioner on his mettle, he finds it more difficult to select his consultant, and feels that the "tinged" attitude is encouraged by over-specialization. A general practitioner, with experience of house-physicians who refused to see surgical cases in the casualty department, was alarmed about future rifts that might appear.

Personal Contact with Consultants

Only eight practitioners feel that the absence of personal contact with consultants is causing a gap to develop. Most meet the consultants from time to time at domiciliary visits or at medical meetings. The frequency of meetings is usually not very great—a few times a year, perhaps. Twenty-three practitioners have little or no contact with consultants. These include four who do not seek it. Another says he hardly knows the consultants, who are 12 miles distant, and feels there is a gap between them and him. Two say they "have no time for consultants."

The very large majority would agree with the practitioner who told me he "likes to travel to a consultation in the consultant's car, for it gives me an opportunity to obtain from the consultant much valuable information." Of those who were in practice before the N.H.S. 90% formerly met the consultant at domiciliary consultations. The proportion

now is 94%. There are probably many more such consultations nowadays. Almost all practitioners are anxious to "be there," but a few definitely place little value upon the meeting. One says he refuses to have the one consultant in the area who insists on the general practitioner being present. Some say the consultants prefer to "drop in in their own time" and not to make an appointment which the general practitioner can keep.

Only 9% of practitioners find it possible to meet consultants in out-patient departments (before the N.H.S. the figure was 12%). In almost all of these cases there are facilitating circumstances, such as a local hospital to which the general practitioner has entry or where he is a co-member of the staff with the visiting consultants. In others the visits are necessarily only occasional. On the whole, general practitioners find that such attendances are quite impracticable because of a clash of times. Some feel that they would not be welcomed if they were able to attend.

Separation of Postgraduate Training

Nowadays a man who wishes to become a specialist is more or less bound to set his course in that direction immediately on qualifying lest he fail to pick up a favourable wind to take him to his goal. He cannot afford, as formerly, to spend time learning something of the hazards of general practice before setting out. He must, in order to be sure of reaching consultant rank, proceed with little or no knowledge of general practice. Forty-one per cent. believe that this plays a part in separating the general practitioner from the consultant. I personally believe that there has not yet been time for this factor radically to affect the relations between them.

It was made clear to me that a large proportion of the practitioners, while quite happy with the consultants they have "used for years and still meet," are fearful of what relations will be like in the years to come, when many consultants will have had no general-practitioner experience. Several remarked upon the lack of understanding of the general practitioner by consultants who have not been in general practice. Others put it the other way round: that one can tell which consultants have done general practice, and that these are the best, at any rate from the point of view of the general practitioner. It is generally also thought by these general practitioners that such are the best from the point of view of the patient as well. Those without general-practice experience have no appreciation of how patients live, so that their approach to the patient suffers, and they make recommendations which are not practicable outside hospital.

One practitioner has the impression that the young consultant is too interested in the scientific side and does not handle patients well. He talks tactlessly in front of them. One feels that their not having had experience of general practice adds to "their feeling of superiority." Another put it this way—that consultants should have occasional courses from general practitioners in the same way as general practitioners do from consultants. Another says that a consultant with no knowledge of general practice is of no use to him.

Twenty-three per cent. said that all consultants should have some general-practice experience as part of their training, and 5% thought that it was unnecessary. Two felt it was necessary only for the general consultant, as opposed to what they were inclined to call the "technician type." One of these thought it was essential for psychiatrists also. I was told that for consultants to have experience in general practice is necessary for the advancement of medicine.

Rather similar arguments and opinions for and against were obtained when discussing the lack of opportunity for the general practitioner of to-day to graduate, in the fullness of time, into consultant status. One said that even if there were opportunities the general practitioner would be up against such specialized competition that it would not be worth it.

Separate Administration

Only about 10% feel that a gap is being caused by the entirely separate, and to the general practitioner remote, administrative arrangements—the executive councils for the general practitioners on the one hand, and the regional hospital boards for the consultants on the other. Some remark that the general practitioner has no channel through which he can make criticisms or suggestions regarding hospital treatment or services. One practitioner feels that the administration is untidy and that there should be one unit of administration for both consultants and general practitioners. In a number of places I was told that no trouble was likely to occur, because some doctors were on both the local executive council and the regional hospital board.

Though perhaps the figures do not underline it, in far too many areas a hedge is growing between the general practitioner and the consultant. The seeds were probably there before the N.H.S. Outside factors, some necessary and some unnecessary, appear to have given a fillip to their development.

The eye of the newly qualified doctor who wants to be a specialist is of necessity, and in the current fashion, fixed upon the material aspect of his career, and sees any chance of experience in general practice only as a likely obstacle to the achievement of his ultimate goal.

This struck me as an unsatisfactory, not to say dangerous, state of affairs, likely in the future to produce frustration in the general practitioner, to diminish the value of the consultant, and thus react unfavourably upon the patient. I liked the plan of one of the general practitioners whom I visited; he makes a practice of asking the house officers in the local hospital to spend a day with him from time to time in his practice. He finds they welcome it and return to their hospitals much enlightened.

Twenty-eight per cent. complain of failure by the consultant to ensure that the general practitioner receives a prompt report on the patient referred. In addition to these an equal number, while not complaining, receive reports only after a long interval. They seem to be satisfied that they receive reports at all. Twelve per cent. say they feel that the younger consultant, particularly, overlooks the interest of the general practitioner in his patient. I heard few complaints of patients being seen by consultants without reference from the general practitioner. There is little increased tendency among patients to approach consultants direct, and usually when it does happen the latter are careful to communicate with the general practitioner. Only in one town did I find any serious complaint, and this from two or three practitioners about more than one consultant. One quoted an instance in which a patient of his was seen by a physician, referred by him to a surgeon, admitted to a nursing-home, and operated upon without the general practitioner knowing anything about it. While being a fairly common occurrence in this one town, it must be emphasized that such things are almost unheard of elsewhere.

The suggestion that consultants and general practitioners should be under the same or a closely integrated administration would no doubt give rise to many objections, and might almost be regarded as revolutionary. Nevertheless, I came away from my investigations with a feeling of which I could not rid myself. This is that the separate administration of the various parts of the medical profession hampers the efficiency of the medical services and detracts from the value of the service to the one for whom it exists, the patient.

Public Health Medical Officers

Relations with public health medical officers have been discussed earlier in this report.

District Nurses

No practitioner has any complaints about the district nurses. Those who commented were full of praise of their efforts. One suggested that they all ought to have the George Cross.

It appears from remarks made by a number of general practitioners that they are using the district nursing service to a great deal more than formerly. Much in the way of injections (penicillin, streptomycin) is being done by the district nurses. This is usually because the pressure of work on the general practitioner is so great. In some I detected what I thought was rather too much readiness to delegate these tasks. In most cases it arises from the fact that the nurse is visiting the patient daily, anyway, and it is thus no hardship to ask her to give the daily injection.

Relations with Health Visitors

Seventy-two per cent. of the practitioners whom I asked (I did not introduce this subject until I had seen about 40) have no complaints about health visitors. Neither were there any reports of co-operation worthy of notice. Some of these have no knowledge of health visitors' activities. Twenty-eight per cent. complain bitterly about them. Some regard them as a waste of nursing man-power.

The complaints heard are mostly of interfering with and instituting treatment and of giving advice outside their sphere without consultation with the general practitioner, and of frightening patients. Mothers are advised to stop breast-feeding—one on account of pain in the breast due to engorgement. One health visitor threatens mothers that their children will develop rickets if they do not take cod-liver oil; another tells mothers that their children have some disease or that they need operations.

Then they promise early admission to sanatoria, which the general practitioner knows is next to impossible. The general practitioner probably gets some of the blame for not seeing that the health visitor's promises are carried through. There is criticism sometimes of the general practitioner's treatment, and remarks like, "Your doctor should have prescribed so and so." There is too much prying into how the doctor is treating the patient and too much talk of the illness of neighbours, colourfully expressed, which frightens patients.

These complaints point to an unsatisfactory state of affairs. Better co-operation with the public health services would surely change this situation, to the patient's advantage. I have seen an experimental practice in which health visitor and general practitioner work closely together and have a daily conference. The benefit to the patient inherent in this mutual assistance is at once apparent to anyone who has attended such a conference, as I was privileged to do.

(C) THE GENERAL PRACTITIONER AND HOSPITAL WORK

Since the inception of the N.H.S. there has been a drop in the proportion of general practitioners doing any form of hospital work. Of the practitioners seen, only 28% had done hospital work before the introduction of the N.H.S. the proportion now is 20%. In the towns 23% did hospital work formerly, now only about 16% do. In the country 38% of the practitioners used to do hospital work, and even now 30% do.

A number, though still doing some work in hospital resent having had their scope reduced. One says he is restricted to doing four tonsillectomies a week, even in the face of a growing list of patients needing that operation. Others were formerly on the staff as surgeons, whereas now although they have the use of general-practitioner beds, they are not permitted to do surgery.

Another point of view was expressed by the man who said that the N.H.S. had brought him to the point where he had either to become a specialist or to give up any sort of hospital work. Others feel that they are being steadily pushed out. The stock example of this is the general practitioner who formerly did all the anaesthetics at the local hospital. Now specialist anaesthetists are being appointed.

Most of the hospital work referred to consists of the use of general-practitioner beds in hospitals. Not all practitioners mind not having such beds. Many general practitioners in industrial areas have never been used to

having hospital beds and have hardly considered the matter as a practical proposition. Thus, only one-third of the urban practitioners having no hospital work or beds feel that their practice suffers in any way because of it. Nearly half of the country doctors feel that their practices would be better off for having hospital beds.

The arguments put forward against having beds are that they are unnecessary; that it means "too many cooks"; that a "lot of rubbish" is talked about the need for beds; that there is not time to use them properly in the face of the additional work arising out of the N.H.S. One practitioner says that, while he welcomes the possibility, he feels that the provision of an adequate number of beds in general hospitals is of far greater importance.

A town practitioner says that the taking away of general-practitioner beds is most damaging to general practice. Because of it the general practitioner of the future will be a less good doctor. Another says that the provision of general-practitioner beds would help to overcome his feeling of professional isolation.

To sum up, the urban practitioners do not seem to have any great enthusiasm for beds, except in the smaller towns where beds have been taken away from them. The country doctors are rather more interested so long as they are not placed so far from the hospital that their being on the staff would interfere with their ordinary visiting rounds. In discussing this problem the question of insufficient time kept cropping up. A number feel that the idea is a good one, and to the benefit of general practice, but are doubtful of being able to spare the time for its proper development.

Clinical Assistantships

Four out of every five favour the suggestion that general practitioners should be permitted to do clinical assistantships in hospitals. Most of them stipulate that time should be made to enable them to do it, or that the appointments should be paid. These two provisos are probably closely allied. There were some practitioners who, although interested, stated that the burden of work was such that they might find it difficult to accept such an appointment, even for one session a week, and at the same time continue to give their patients adequate service. The position would obviously be easier in partnerships where the partners were co-operative and would not all wish to undertake clinical assistantships at the same time.

A number expressed the view that it would be economically possible to take up a clinical assistantship only if no diminution of income were involved.

Some expressed the opinion that such appointments would be valuable for younger men only, say up to the age of 40. One says he would like to do it, but feels he would not be made welcome and would be looked down upon by the hospital staff. This mode of expression, which again points to the gap between consultant and general practitioner, kept cropping up in various guises during the whole of the survey.

Another favours clinical assistantships, not mainly because of the clinical value, but more for the advantage it would bring of close contact with the consultant world. Another says it should be compulsory for all practitioners at intervals.

Those unfavourable to the idea think that a general practitioner should stick to general practice, that if he did his work properly he would have no time. Some feel that it would be worthless because clinical responsibility would not be given; that it would not help because it would be specialist cases, not general-practitioner cases, that would be seen; and that what the general practitioner requires much more are general-practitioner beds in a local hospital.

(D) HOSPITAL FACILITIES

Fifty-two per cent. of the practitioners visited feel that practice is obstructed by the inadequacy of hospital services. The inadequacy refers to quantity rather than quality, and is of course closely bound up with staffing and accommodation.

Waits for Out-patient Consultations

According to 60% of doctors the average wait for consultations is two to three weeks; only 10% can expect their patients to be seen in a week or less. Eight per cent. find two months or longer to be the expected wait for an appointment unless the practitioner marks the case urgent. Most practitioners say they do this only in cases in which delay would harm the patient.

Opinions vary on what length of wait constitutes an obstruction or interference with the conduct of the practice. Some regard three weeks as too long, others are content. Just over 20% complain of obstruction.

Some say waits are long only for certain departments. The orthopaedic departments undoubtedly lead the field in occasioning lengthy waits, while usually E.N.T. and psychiatry tie for second place.

With psychiatry, of course, hurry is impossible. Some general practitioners feel that the E.N.T. specialists would be freer to see patients more quickly and to advise and operate on the more complicated cases if general practitioners were once more allowed facilities for operating on tonsils and adenoid cases. The long delay (two years or more) for tonsils and adenoid operations is such a common cry among general practitioners as to provide material for a music-hall joke. Many general practitioners who formerly undertook this work are no longer allowed to. They are not paid, and hospital facilities are denied them.

The long wait in orthopaedic departments was sometimes attributed to the inability of many of the specialists to trust the general practitioner to keep an eye on the patient.

Waits for Admissions

Whereas the greater proportion of doctors visited have constantly with them the bogey of long waits for beds for their patients, only in rare instances did I hear complaint that the admission of a suspected early cancer case was so delayed as to jeopardize the possibility of a cure by early treatment.

The satisfied practitioners are well content if their "cold" surgical cases are admitted within three months of their first being seen by a consultant. All agree on the necessity for maintaining a priority system for admission. For simple hernia, for example, the clerk can wait, while a high degree of priority is given to the collier.

About 70% of the doctors report that the "normal" length of wait for admission for non-urgent cases is six months or more. A few are able to get any type of case into hospital within a week because beds are available and the turnover is rapid. Yet one general practitioner told me that the surgeon to whom he refers his patients has ten patients waiting for each of his hospital beds. General practitioners who are on hospital staffs or in close touch with consultants find things easier.

Several mention that they are driven to using the domiciliary consultation service at times as a method of ensuring that patients are admitted to hospital. This applies rather more to emergency admissions, when it is used as a last resort. Fourteen per cent. of practitioners find serious difficulty in obtaining emergency admissions—12% of country doctors, and more than 14% of town doctors. Considering all that has been heard publicly about this problem, the number of practitioners reporting difficulty seems surprisingly small. The reason almost certainly is that where difficulties do exist they are usually very great.

Where an Emergency Bed Service operates I found a fairly consistent volume of praise for it. Admission is not always obtained by this means, and the service sometimes seems to be awkward. Nevertheless most practitioners find it infinitely preferable to the position of the country doctor who told me he "sometimes has to try four hospitals, each 20 miles away," or of the one who sometimes has to "go on his knees," or of him who has to spend an hour telephoning.

The Emergency Bed Service does not escape criticism. Several practitioners resent being asked to tell a lay clerk the temperature of a patient in whom he has made a diagnosis of acute appendicitis requiring admission to hospital. There are similar objections to "viva voce examinations" by house officers and questions such as, "Have you felt the pulse?" There seems a lot to be said for the principle that if a general practitioner has decided that admission to hospital is urgently necessary then the job of the Emergency Bed Service should be to find a bed and not first to decide whether or not a bed should be found. Presumably the Emergency Bed Service clerks ask certain questions (described as "impertinent" and "silly" by several) because they in their turn are asked these same questions by hospital officers.

Anyone who has had experience as a house officer knows that each area has its small quota of general practitioners who are adept and practised at obtaining urgent admission to hospital for patients whose clinical condition does not warrant it. Nevertheless, only those with experience of general practice can realize what a tremendous relief of anxiety there would be for general practitioner, patient, and relations if hospitals were to agree to see any patient whom the general practitioner regarded as urgently requiring admission. It would be for the hospital to admit him or to arrange his admission to another hospital unless the general practitioner was considered, by a doctor who had seen the patient, to be mistaken. The small number of offenders found to send cases frivolously and frequently could surely be dealt with tactfully by a quiet approach from a doctor connected with the hospital.

Admission of Aged and Infirm Sick

Long waiting for admission to hospital for the aged and infirm sick, and for old people, is almost a universal problem. Eighty per cent. of practitioners complain of the difficulties. Country and town are equally bad. Such expressions as "very bad," "hopeless," and "very time-consuming fixing them up" were evoked over and over again. Some describe the position as desperate and frustrating; the relieving officers who used to do such a wonderful job have disappeared. Particularly worrying has it proved where the local Poor Law hospital has been turned into a general hospital. One doctor said it was not surprising there is a problem: there are now 35 beds for chronic sick in his area, where formerly there were hundreds. Several told me that many on the waiting-list die before they are sent for.

I was told of a medical superintendent who visits the home of every patient who is proposed for the waiting-list. He examines the patient and assesses the degree of priority or urgency of the case. The admission list is maintained accordingly. The effect is said to be to make each general practitioner feel that his patient is being given the same chance of admission as the patients of other general practitioners, and that the worst cases stand the best chance. This method is thought to be fair and to deal with the problem on the right lines. The practitioner who told me of this is far less harassed than most others.

Another complaint I heard was of the unwillingness of the young people of to-day to care for their old folk. In several houses I visited this was apparent. I got the impression that some of the young couples, trying to concentrate on making and keeping a pleasant home for their families, are vaguely frightened of the possible effects of the home being centred round a chronic invalid. They are persuading themselves that the old people would be looked after better in hospital. The enormous increase in the numbers of old people has created an immense problem.

Housing conditions do not permit an easy solution, and lack of hospital beds prevents the most obvious solution. The result is that four out of every five general practitioners are daily grappling with this problem and are bearing a very large proportion of the burden of it. Others are

grappling, too, but the general practitioner and the district nurse find themselves in the hottest part of the fight, and with next to no weapons.

Tuberculosis

Another almost constant worry is the long wait for sanatorium beds. Only 23% say that waits are not long; 7% have no experience or make no comment. The remainder are finding that their tuberculous patients have to wait many months for admission to sanatoria. Attention has long ago been called to this situation, but it still persists.

Fifty-seven per cent. of practitioners are satisfied with the arrangements in their neighbourhood for the domiciliary care of tuberculosis cases. Some are satisfied because they supervise the treatment themselves, giving streptomycin and P.A.S., or sharing this duty with the district nurses.

Thirty-three per cent. speak of insufficient visiting and not enough attention to the patients in their homes. Some say they feel that the chest physicians have too much to do and too few chances of getting a sanatorium bed. As a result the care of patients in their homes is inadequate. They complain that all the care many of these patients get is to attend at the clinic about once a month and there be told that they are to come again in another month to have a further x-ray examination.

Three doctors specifically complain of the difficulty in getting patients visited in their homes, even when pressed, of a delay of a week before a visit was paid to a case of haemoptysis, and of six weeks' delay in visiting another case, despite several telephone calls by the general practitioner. A typical instance of the kind of inattention complained of is that of a patient being visited three times in two years by the "tuberculosis nurse" and nothing else.

Minor Operations at Hospitals

Only 14% complain that there are long waits for getting minor operations performed on patients at hospital. The remainder have no complaint. The complaint does not apply to urgent infective conditions, but only to such conditions as sebaceous cysts and ganglia, the majority of which can usually be borne for a few extra weeks without hardship.

Reasons for Inadequacy of Hospital Provision

Practitioners were asked for their opinions about the reasons for the inadequacy of hospital provision. The majority had no theories to offer or drew attention to the building situation and the shortage of nurses. A few mentioned that nursing as a profession was unattractive and underpaid. Others mentioned general practitioners sending cases to hospital unnecessarily, increase in the local population, and the fact that advances in medicine have made it possible to operate upon patients whose condition would formerly have been regarded as hopeless.

Some remarked on the effect of allotting fewer and fewer beds to more and more specialists in smaller and smaller fields. There is less flexibility of beds and fewer are available for general and emergency work. Teaching hospitals are blamed by some for keeping interesting cases too long, for teaching purposes.

Some attribute many of the difficulties to the fact that the introduction of the free service, coupled sometimes with public education in health, and always with official encouragement to use the service, has uncovered many conditions the existence of which the patients formerly kept to themselves. Now patients are enlightened and encouraged and are presenting themselves for treatment, and they need treatment; and until this back-log is dealt with the hospitals will give the appearance of inadequacy.

Appointments Systems for Out-patients

Most practitioners now find an appointments system operating in the hospital out-patient departments to which they refer patients. Twenty per cent. of these comment unfavour-

ably. Most of them say that patients have to wait just as long as ever they did when they reach the hospital. In fact, the appointments are not kept by the hospitals.

A few say that the appointments system acts like a dam, letting a little through while the water accumulates behind it. The consultants now see only a prescribed and appointed number and the delays get longer and longer.

A favourable comment was that the general practitioner may now grade according to urgency the patients he sends.

Some hospitals send for two or three patients for one appointment and are criticized for thus causing delay. The defence may be that patients on occasion fail to keep appointments and that it is necessary to ensure an adequate flow of patients for the consultant to see.

On balance, I find that the appointments system is favourably viewed. Most general practitioners feel that if further study is given to the problem a more satisfactory system could be evolved.

Direct Access to Radiological Departments

Forty-one per cent. of practitioners are able to send their patients direct to the x-ray department. Of those without such access 53% complain that their practices suffer, especially from the consequent delay in coming to a diagnosis. Of those with no complaint about the lack of facilities, a substantial proportion say that the reading of an x-ray film needs a consultant's opinion as well. Fifty-one per cent. report that they discuss the results with the radiologist. One practitioner finds great advantage in being able to go to the hospital, when he has time, and take part in the screening.

An important point made by some is that when a general practitioner refers a patient for an opinion the consultant of to-day "invariably has an x-ray film done." It is argued that most general practitioners are excellent judges of the need for such investigation; they can be, and should be, trusted with direct access. If they were, the amount of radiology would appreciably lessen.

Direct Access to Pathological Departments

Sixty-five per cent. of the general practitioners have direct access to some pathological facilities. This is by no means always the pathological laboratory of the local hospital. In some areas pathology, often limited in scope but more than the bacteriology required solely for purposes of preventive medicine, is done for general practitioners in the laboratories of the public health service. This is warmly welcomed by them. In one large town, where I visited several practitioners, all spoke appreciatively of the service of the borough pathologist, his eagerness to help, and his interest in the correlation between the patient's illness and the pathological findings. He often visits the bedside.

Fifty-two per cent. of those without such access feel that their practice suffers from this lack. About half of the practitioners, on occasion, discuss the results with the pathologist. While two complain that it is difficult to get in touch with the pathologist and another that the pathologist would not welcome it, others say the reports are adequate and they have no need for such discussion.

Very few (10%) do their own blood counts. Some say they used to do them but have given it up owing to pressure of work. A few do estimations of haemoglobin and sedimentation rates. The large majority of general practitioners consider that their results would be of little value, for they have no time to keep their hand in.

Physiotherapy Service

About one general practitioner in five can arrange for physiotherapy to be given to any patient of his requiring it. Some of these have to send to a physical medicine specialist, but reasonable requests are not refused. The remainder must first refer the patient to a consultant, as it is he who can authorize physiotherapy. In 34% this involves long delays, sometimes because the orthopaedic

consultant cannot see the patient for several weeks, sometimes because of inadequate facilities in the physiotherapy department, sometimes both. In acute conditions the symptoms may clear up before treatment can be started.

In a number of towns and in a few country areas the patient may obtain physiotherapy privately. This may be less costly than repeated expenditure on bus fares to the local hospital. Many general practitioners think a domiciliary service would be better, and instance the time spent in draughty buses and out-patient halls as undoing any good done by treatment. One general practitioner is annoyed at having to send patients 17 miles away to obtain a consultant's recommendation for treatment at a clinic just down the road from his own surgery.

Some think the consultants keep the patients under treatment too long, thus lengthening the wait for others. Three practitioners say that too many facilities for physiotherapy tend to stop patients helping themselves. Some like the "screen" and are not anxious for direct reference.

There is not sufficient physiotherapy for all, but, except here and there, I did not get the impression that this is causing serious hardship.

(E) RELATIONS WITH HOSPITALS

Questions were asked concerning how far hospitals were encroaching on general practice. Only a very small percentage thought that this occurred on a serious scale.

Only 3% of practitioners complain that hospitals see patients without a doctor's letter. This, of course, excludes patients presenting themselves "off the streets" as casualty cases. One in four finds that hospitals tend to some extent to retain cases longer than necessary, keeping them for treatment which could be regarded as in the province of the general practitioner. More than half of these general practitioners do not mind, and are perfectly happy for the hospitals to shoulder the burden. The practice is not always frowned upon, for, as some practitioners say, the hospital doctors often feel that, having started the treatment of a case—for example, incision of an infected palmar space—they are shirking their duty if they do not continue to treat the patient until the condition is almost cleared up. They do not consciously or deliberately take work from general practitioners.

Half the practitioners find the position much improved under the N.H.S., though complaints are still heard that the hospitals do not appreciate the distances patients have to travel to attend daily for simple dressings. Some attribute the improvement to the fact that in the past the hospitals were interested to keep up high attendance records in order to qualify for grants from certain voluntary funds, whereas this no longer applies.

One-third of the practitioners feel that the out-patient departments are crowded with minor cases which should not be there. This causes delay in obtaining early treatment or advice for new and more important cases. A considerable number, including some of those who told me that they no longer do any minor surgery because they "do not get paid specially for it," blame other general practitioners for sending such cases to hospital.

There is some suggestion that hospitals encourage chronic invalidism by telling patients unnecessarily to report back, being afraid of the responsibility of discharging them. The hospitals should realize that they can trust the general practitioner to refer the case again if he is not satisfied.

There is a great deal of complaint regarding the crowding of orthopaedic departments. This point stands out in the replies I received on this subject. Many general practitioners feel that those responsible for seeing and following up patients who are being treated for orthopaedic conditions are too reluctant to let go of them. They are unwilling to trust the general practitioner to keep a satisfactory eye on these patients during the more static periods of their treatment; for instance, while a limb is in plaster. It is common experience that such patients are told by orthopaedic departments, in what is no doubt a laudable attempt

to ensure the most perfect supervision of the patient's treatment, to report back week by week. At these attendances all that happens is that the patient is seen, maybe by the house-surgeon or registrar, asked if the plaster is giving any trouble, and then told to report again in another week. The general practitioners contend that they can be trusted to keep an eye on a plaster and refer the case should they suspect that all is not well. At the same time they feel that the cluttering up of the out-patient department by these queues of unnecessary weekly visitors takes away much of the consultants' and registrars' time that should be made available for seeing and treating new patients.

Ten per cent. say that they are not informed when their patient is referred to another department for further opinion. Some of the remaining 90% say that on occasion they do not hear of the reference until the case is "complete." Some feel that, when they are still in attendance on a patient who is attending an out-patient department or undergoing investigation, it is helpful to be kept informed of what is going on. Not to be so informed clouds their relationship with their patient. Others think that it is too much to require of the hospitals and are quite content to wait until the investigations are complete.

In two practices only was there serious complaint that transport was being used like a daily bus service to convey patients to and from the hospital to receive minor treatment which the general practitioner himself could give. In five other practices the view was aired that transport was being rather wastefully used by the hospital.

Lack of understanding of the problems of the general practitioner is almost certainly at the bottom of most of the complaints (from 27% of the practitioners) that when patients visit hospital they are given the impression that better medicine is available there than at the hands of the general practitioner. One practitioner complained of the maternity hospital; others of similar isolated instances.

Some young house officers are said to regard the general practitioner as a low grade of doctor. The fact that a small proportion of general practitioners misuse the hospitals tends to detract from the esteem in which most of them should be held and to promote careless harmful criticism. I heard of a registrar who, lecturing to students by the bedside, held up the general practitioner's letter and said, in the hearing of the patient: "You need take no notice of this." Then, again, a young consultant, thinking aloud, said that the patient's condition might be due to sleeping tablets prescribed by the general practitioner. This patient and his family have now left the general practitioner and will probably influence others of his patients in the village to do the same.

One practitioner, in speaking of such disparaging remarks, said that his knowledge of his colleagues in the neighbourhood suggested that some of the remarks were true—but he did not say he thought their utterance was justified.

Some think sisters and nurses are at fault. Patients ask them, "Should my doctor have sent me to hospital sooner?" and the sister, sometimes, perhaps, but not always correctly, replies, "Yes," forgetting that the delay in admission is more likely to be due to the long waiting-list than to the general practitioner's inefficiency. One said that he felt sure the nursing staff gave the impression that simple dressings and the like are really properly done only at the hospital. They may not think of the general practitioner and his relationship with his patient, but the latter is only too ready to interpret it as a reflection on the general practitioner. I heard no suggestion that patients are deliberately given such impressions.

The occasional absence of any appreciation of conditions in the home was illustrated by the instance of a woman sent home 10 days after delivery and told to apply treatment to her baby's eye every 15 minutes, day and night.

These complaints can be explained by a lack of knowledge of general practice, a lack of awareness of how easily damage can be done, and a strong element of thoughtlessness.

There is also lack of understanding of each others' problems almost everywhere, but it is only fair to mention the many general practitioners—some of whom have minor criticisms—who state that the hospitals serve them well and are very helpful.

One of the potent causes of harm to the doctor-patient relationship is inadequate liaison between the hospital and the general practitioner, particularly at the time the patient is discharged from hospital. It can also interfere with the convalescence and treatment of the patient.

About one-half of the general practitioners do not complain of the poor liaison, and many of these refrain from complaint only because they feel the staffs of hospitals are hard-pressed.

The large majority receive a letter from the hospital telling them about the patient's progress and treatment in hospital some two to three weeks after he has been discharged. Less than one in five hears within a week.

Less harm is done when the patient sends a message for a visit the day after his discharge. Only thus does the doctor know that the patient is once more under his care. But the patient still remains mystified that his doctor has not heard from the hospital. As the days go by he may begin to wonder what there is about his doctor to explain why the hospital has not bothered to write.

The general practitioner's prestige and the confidence of the patient in him are seriously damaged by this prevalent lack of attention on the part of hospital authorities. Incidentally, teaching hospitals are reported to be the worst offenders. In one large teaching hospital the ward sister, on being asked by a patient on his discharge whether he should inform his general practitioner, says: "No, of course not. We shall be writing." The registrar or house officer is unaware of this promise—or one hopes he is—and does not carry it out, at any rate not for a week or two. The patient waits at home confidently expecting his general practitioner to call, while the general practitioner is quite unaware that the patient is once more under his care. After a few days of waiting a message may be sent. By that time the patient is in no mood to believe the general practitioner's side of the story.

A great deal of harm and embarrassment is caused by such thoughtlessness. As regards the sending of information to general practitioners, only in a few cases did I hear such remarks as, "Very good and prompt," "I am telephoned before patient's discharge." Others report that damage is constantly being done. In a case of miscarriage the patient was sent home the day after admission, but the general practitioner was not informed. General practitioners often complain that they are not notified when a patient dies. The cheery inquiry after a patient's health two days after he has died takes some living down. One practitioner told me of being called to a case of diabetic coma the day after the patient's discharge. He was completely in the dark about the insulin arrangements. I witnessed a similar case with another practitioner late at night. In his case it was hypoglycaemic coma. Timely information from the hospital would have greatly simplified the doctor's task.

Practitioners complain that they lose patients by not visiting them after their discharge from hospital. Many patients will not believe that their doctor does not know of their discharge. To a patient his own case is all-important. Surely the doctor must have been told? Some general practitioners say they suppose the trouble is due to the shortage of typists. To excuse it on these grounds is to postulate that a typewritten letter is essential. It is not.

A number of the practitioners I visited felt that if only house officers could be informed of the implications of these problems they would ensure that general practitioners received, within 24 hours of the patient's discharge, at least the information essential for the continuation of treatment. A fuller account, where necessary, could follow when time permitted.

(F) THE DOCTOR-PATIENT RELATIONSHIP

Nine out of every ten practitioners have friendly relations with their patients. Consultations are conducted on a friendly plane. Though the warmth of the friendliness varies, only 6% of the practitioners visited regarded the relationship as a purely matter-of-fact or business-like one. In one-third of the visits a specially high degree of mutual respect and friendliness between the doctor and the patient was apparent.

Ninety-six per cent. of practitioners believe that one doctor for a family is desirable, and find that such a state of affairs largely holds good in their practices. Sixteen per cent. strongly object to sharing a family with another doctor, and some will go to the extent of requesting patients to leave their list in order to avoid it. One said that he would take this action even though he is most anxious to increase his list. Sometimes there is no alternative, as there is no other doctor in the area.

In some cases both partners attend at various times, which represents some departure from the strictly individual family-doctor principle.

Some women doctors find themselves unable to feel strongly about this, as they acknowledge the desire of the man of the house to have a male doctor. One woman doctor told me she takes only women and children as patients. A young couple may on marriage retain two different doctors. Often the arrival of the first child brings the whole family under the care of one practitioner.

While the majority of practitioners are agreed that the attitude towards them of at least some of their patients has deteriorated, I did not find proof of the current statement suggesting a wholesale disappearance of friendly relations. Seven per cent. find that a substantial number of their patients tend to regard them as a servant, and about 3% notice a marked tendency to be regarded merely as an official. Thirty-two per cent. report a definite tendency to be regarded as a supplier of medicines rather than as a medical adviser, while 22% detect this tendency in a small minority only. From my own observations I believe that in nearly all these 54% of practices this tendency is noticeable among only a minority. Some general practitioners are so easily irritated by such an attitude that they are apt to think it more widespread than it actually is. One doctor described the attitude well when he said, "Some of the patients now merely include me with their errands: rations from the grocer, a call at the shoe repairer's, and a bottle of cough mixture at the doctor's." In about half the surgeries I attended I heard the shopping-list technique in action, often one person calling for a list of needs for two or three.

Twenty-seven per cent. declare that their patients regard them as a friend, and 32% as a "professional man." In many cases the relationship is described as "a bit of both." One woman doctor says her patients regard her as "a doctor, woman, and mother."

Mention was often made of the unsatisfactory attitude among the younger adult patients, but it is presumably possible that better relations may develop, perhaps when the patients are up against it and the general practitioner helps them out. It can hardly be expected that the youthful patient and the youthful doctor will achieve a satisfactory relationship straight away. It is therefore not surprising to find the percentage of those general practitioners in the youngest age group whose patients

regard them as friends is smaller (16%) than in the older age groups (31%). There is little doubt that there exists among the older group a proportion of general practitioners unable to adapt themselves easily to the new service, while the tendency among the middle group is to accept it and adapt themselves more readily. This is perhaps in the nature of things, and may well have a bearing on the doctor-patient relationship.

On my mentioning the word "servant" some said, "I would not tolerate such an attitude," which underlines the truism that it takes the doctor and the patient to make the doctor-patient relationship.

Attitude of Ex-private Patients

Two-thirds of the practitioners find no adverse change in the attitude of ex-private patients. There are, of course, more demands by some who formerly could not afford to send for the doctor so often. The general impression is that there is a settling down after a bad start.

Many practitioners have told their private patients that they are perfectly welcome to join the N.H.S. list. In some cases a knowledge of the patients' purse and pride has led the practitioner to encourage them to join the list. At the same time it has been explained to these patients that the call at the house, rather than a consultation at the surgery, would be made on clinical grounds only.

One in four complain that they are beset by increased demands by their ex-private patients. Now that the service is "free" the family medicine chest and the home doctor are set aside and the general practitioner is summoned. Some find that their patients still want to "dodge the column," to have the frills for which they formerly paid, the prolonged visit (instead of the wait in the surgery), and at a time to suit the patient. Most find little trouble in this direction. They say that patients are learning to adjust themselves and are becoming content with the new arrangements. Some have explained to their patients that it is like the theatre: the show is the same, but they are to see it from the pit instead of the stalls. Quite a large number of practitioners find their former private patients are more considerate and indeed hesitate to send as often or as early as they should for fear of imposing on the practitioner.

About four out of every five practitioners report that either none or a very few—for example, 6 to 20—of their private patients have remained as such. Forty-five per cent. of practitioners feel that the refusal to allow private patients to have drugs and dressings free of charge under the N.H.S. has substantially reduced the number of patients remaining private. It has been quite commonly observed to general practitioners, "I wouldn't mind your bill, Doctor, but I cannot afford the chemist's." A number of practitioners are inclined to be bitter about this matter, feeling that there is more behind it than just an interpretation of the Act, that its enforcement is a shaft deliberately aimed at their freedom.

Though, in the nature of things, what little private practice there is flourishes more easily in the towns, I found no marked differences in the proportion remaining in the towns as compared with country practices, nor in the different age groups.

Forty-three per cent. say they do not wish to have private patients now. The advantages of not having to relate medical care to finance are mentioned. Then, some say that private patients are too much bother, they want too many frills, and that much private practice is

too far removed from real medicine. Twenty-two per cent. are indifferent in the matter or are unable to comment, having little or no experience of private practice.

The remaining 35% are anxious to preserve at least some private practice. They agree it may be exacting, but they believe it to be the correct relationship between doctor and patient, and are prepared to give the frills. Some say that private practice must be preserved or the standard of medicine will drop rapidly; that private practice is the challenge to the doctor to give good value; that the capitation fee lacks this challenge; that in private practice good medicine can be done; that the homely chat and the giving of non-medical advice are most useful.

Some like private patients because they pay better. In some practices the retention of a small proportion of private practice has enabled the practitioner to "keep his head above water" financially.

(G) ORGANIZATION OF GENERAL PRACTICE

Premises

In trying to assess the suitability of doctors' premises I had in my mind an idea of average premises, reasonably comfortable for doctor and patient, with no hindrance to the satisfactory conduct of the doctor's work and with reasonable warmth in both waiting-room and consulting-room. The furniture was also considered in the assessment.

Often the type of accommodation varies with the class of practice or the neighbourhood. The more elegant, homely, and comfortable premises are usually associated with the better-class practices. This factor seems usually to be unrelated to the size of the practitioner's income. Some of those with small "good-class" practices often have the best premises. In many cases this is due to the furnishing having been undertaken when the practice was a private and more remunerative one.

I have not taken into account in this assessment those branch surgeries which are but a house of call, usually consisting of a front sitting-room of a cottage or council house, furnished in traditional style, and used only for the simpler clinical work.

The average adequate consulting-room is clean, reasonably bright, and fairly well decorated, with seats for patient and friend as well as for the practitioner, a couch, and a satisfactory method of heating. There is room to manoeuvre, for examining patients, and for the conduct of minor procedures. Lack of space is sometimes compensated for by the existence of a separate room for examinations. Forty-nine per cent. of the practitioners had premises conforming to the above description. The premises are not usually convenient for the performance of more than minor procedures; nor is it necessary that they should be, for most practitioners do not undertake anything beyond minor surgery in their consulting-rooms. They are adequate for maintaining a high clinical standard. In order to be a good doctor it is not essential to be surrounded by cream paint and chromium plate.

About 17% of the premises seen may be described as being well above what may be considered adequate. In these were found separate examination-rooms, fully carpeted, spacious, elegantly furnished rooms, and newly built surgeries with special rooms for treatment and minor operations.

About 24% of the practitioners have premises which are fairly adequate but in which something essential is

lacking or below standard. In these, for example, I noticed the absence of washing facilities, inefficient heating, or a rather dismal and uninspiring appearance.

I regard 10% as unsuitable. Rooms are dismal and bare, dirty and inhospitable, and often totally inadequate for the number of persons attending. One doctor sees patients in a porch. In some poorly housed districts it seems to be difficult to maintain the standard of the premises above that of the neighbourhood. Any feature of comfort or cleanliness is soon defaced. Some general practitioners are evidently discouraged when they see lines round the walls where greasy heads have rested or marks of nailed boots on the floor. In one instance the doctor has had to bolt his waiting-room chairs together to prevent their being taken. One practitioner did not show me his premises.

It is not always the general practitioner's fault when premises are inadequate. There was the doctor who was seeing his patients in a room about 6 by 12 feet. Two-thirds of the way down the room was a screen, beyond which sat six to eight patients. This was his waiting-room, a small corner being set aside for his secretary-receptionist. The remainder of the room was the consulting-room, in which there were a couch, an instrument trolley, and a desk. The doctor complained bitterly of the arrangement. He formerly had a suite of rooms which he rented, but the property had been sold over his head. He declared that the rent had been raised so high that he had had to leave. He had been unable to find better premises anywhere in the area. He understood that his rent had been raised to make way for the followers of a calling less honourable but more lucrative than medicine.

Sometimes poor premises have had to be substituted for better ones that have been bombed. In some cases landlords are unreasonable and are concerned more with raising rents than with effecting repairs and decorations.

Sometimes a surgery is badly decorated or ill-appointed owing to uncertainty of tenure and consequent unwillingness on the part of the general practitioner to spend money on it. A doctor in a provincial town told me that the rent for his small consulting-room and moderate waiting-room was equivalent to that of a medium-sized London flat. There was no other accommodation in the town and the owner took advantage of this fact.

While present housing conditions prevail a knowledge of the facts is necessary before premises are criticized. Nevertheless, there are a few practitioners who do not appear to appreciate the functional value to their patients and themselves of clean, cheerful, and suitable premises, and some who are so poorly paid that they are unable to make the improvements they know to be desirable.

Equipment

It is quite a hardship upon a new entrant into practice to equip himself with the basic range of instruments and equipment. The established practitioners only rarely need to buy new items. I found that 91% of practitioners have what one might call the full range of essential equipment. The instruments about which I inquired were those for the treatment of wounds and accidents and for the simpler minor surgical procedures, syringes, and the diagnostic instruments, auriscope, ophthalmoscope, stethoscope, sphygmomanometer, and urine-testing apparatus.

A number of practitioners do not have a proctoscope or a vaginal speculum. Others say they have them in the cupboard but that they "never use them nowadays." Nine per cent. have not the basic equipment mentioned above. Sixteen per cent. have more elaborate equipment, including ultra-violet and infra-red apparatus, x-ray plant, or special instruments of other kinds. It must be emphasized that such instruments are not essential to the ordinary conduct of general practice. One young town practitioner said that he would not buy instruments, as it does not pay him to do minor operations.

On the whole the standard of equipment is quite adequate as to essentials and in view of the diminishing range of some practices. The instruments are not always kept attractively, and I have seen many lying about dusty and disused. But when needed they can be cleaned. Many practitioners have electric sterilizers, and those that have not usually have available some method of sterilizing instruments.

Co-operative Arrangements with other General Practitioners

Perhaps the most unsatisfactory feature of some of the rota systems is that they are too large. A well-perfected arrangement, from the practitioners' point of view at any rate, that I saw is one in which ten doctors work not in partnership but "in symbiosis" in one building with ten consulting-rooms. Each has his own practice and shares the message-taking clerks with the other nine. After morning surgery is over one doctor takes all the new messages until the following morning, when the next doctor on the list takes over. Midwifery cases are excepted. The practitioner is on duty for the whole area for one day in ten and for one week-end in ten. At busy times there are always two doctors on duty. It is claimed that, with freedom from worry about extra calls, the general practitioner not on duty can proceed unharassed with his routine visiting, do his evening surgery at the right time, and thereafter enjoy his leisure.

Whatever may be the rights and wrongs in this matter I am left in no doubt that the practitioners who have been able to make some sort of co-operative arrangements with neighbouring doctors have much less anxiety about their work and are happier for being able to enjoy a small amount of leisure. Some have only a casual arrangement, some an arrangement for week-ends only, and some for half-days only. The majority have an understanding only with partners and assistants. Some partnerships help out a single-handed neighbour and require nothing in return.

In some areas the introduction of a rota has done more than ease the constancy of the burden on the individual. It has turned the sourness of professional rivalry into the sweetness of co-operation. Yet in other areas the sourness and the doubts remain. Practitioners are suspicious of one another. I noticed particularly that it was some of the younger men who told that they have tried to arrange a system of mutual co-operation with the other doctors around them but that their efforts have been met with refusal and suspicion.

There is of course, here and there, the individualist. He does not wish to leave his practice to others, not because he is suspicious but because he considers his patients are his own business and his own duty, not to be delegated. If his patient is taken suddenly ill, he prefers to be there, to go himself. There is much to

be said for this attitude. I can only remark upon the less worried mien and the more rested look of the man who can get away from time to time and can return to his practice with a freshened outlook. He is happier than the man who snatches a half-day and returns to his home on a cold evening knowing that there will be three or four (or more) messages on the pad in the hall awaiting his attention.

In one or two instances the practitioner declines to join in a rota because he does not want to be involved in emergency calls which might be well outside his own area. In other cases a rota is impossible owing to distance. A number of country doctors live in professional isolation and need to be on call the whole time. The isolated general practitioner who wishes to have a holiday has no chance of arranging for one or two colleagues to look after his practice and to return the compliment when he gets back. He must have a locum if he wants to go away; often he can neither afford nor obtain one. Inquiries show that it is not more easy to obtain a satisfactory locum nowadays. The main difficulty with locums at the time of the survey was finding the money to pay them, for a locum tenent's fees were the same for all practices, whether the principal's remuneration was high or low, whether his list was large or small.

Appointments System in General Practice

Inquiry was made into the practitioners' custom of seeing patients by appointment. Only 2% of practitioners see their patients by appointment only. Of the remainder one-third never see patients by appointment and two-thirds use an appointments system for special examinations, for life assurance work, and for private patients. The figures show that this practice is about the same in town and country, but that doctors in the two youngest age groups are more inclined (70%) to use an appointments system. The system is used by 58% of the oldest age group.

Employment of Non-medical Staff

One-fifth of the practitioners say they are handicapped by the absence of ancillary help, and by this is usually meant clerical or secretarial assistance. The remaining 80% say they are not. About half the practitioners have some form of help, whether part-time or full-time, suited to their needs, sometimes shared with a partner or partners. About 25% of practitioners would like such help but have not got it. Usually it is a question of finance. There may not be full-time employment and there is difficulty in getting someone to take on the job part-time. A further factor is the impossibility of altering the surgery premises to accommodate clerical help.

The help that is most wanted is someone to get out the record cards and put them before the practitioner while he is seeing the patients. Then there is the taking of messages during surgery hours, to enable the practitioner to carry on with his work undisturbed by calls to the telephone. The replacement of the cards after the patient has been seen and the filing of letters and consultants' reports can also be done by a confidential clerk.

Most large practices have such help. In the smaller practices it is not often a problem because the doctor is more likely to be concerned with dealing with distances and access difficulties than with large numbers of letters and cards. These do not often want clerical

help. It is the middle-sized practice that is the problem, where numbers are sufficient to make the clerical work a time-consuming burden and where remuneration is not enough to allow of the employment of a clerk. About 55% of the town practitioners employ some sort of assistance, while only 40% of the country practitioners do.

Record-keeping

Three out of every four general practitioners pay a reasonable amount of attention to record-keeping. The card of each patient is seen in the surgery (and for this a secretary-receptionist is a great asset), but only one in three finds it necessary or convenient to take the cards out with him on visits or to enter details at the end of each day. The type of notes varies from the very full to the very brief with only essential features recorded. A common custom is to take the opportunity of entering on the card a summary of any particular illness when the patient who has been visited subsequently attends at the surgery, for instance, for the final signing-off certificate.

The remainder seem to pay rather scant attention to records. Some regard record-keeping as a sort of "red tape" imposition. Others say that hunting out and replacing, say, 40 record cards during a surgery add so many minutes to the length of the session. They can afford neither the time to do it themselves nor the clerical assistance to do it for them. One finds "it a nuisance"; another "can't be bothered." The cards are sometimes kept well out of reach. Some record "important things only." Another says that to keep his records properly would occupy him till midnight.

I noticed that a good deal of irritation arose when a practitioner was on the list of more than one executive council. I met one who had patients in the areas of four executive councils. There is a separate pad of E.C.10 forms for each area. The searching for the right pad or the altering of the heading in ink is an unnecessary bother to the busy general practitioner. There would not seem to be much interference with the accountability of prescribing and dispensing if all E.C.10 forms bore no area heading, and were rendered to executive councils according to the address of the chemist dispensing them.

Effect of the N.H.S. on Organization of Practices

The introduction of the N.H.S. seems to have made very little difference to the organization of practices.

Sixty-four per cent. of practitioners say that it has had no effect, and 13% of the remainder were not in practice before July, 1948. Nine per cent. discharged their dispenser, 3% took on a clerk. Many stopped dispensing. Three per cent. opened new branch surgeries and 3% closed them. Twelve per cent. opened new surgery premises or specially altered or improved them. Eight per cent. took on a further partner or engaged an assistant. These are some of the changes that were made to meet the altered circumstances, but in the main the practitioners have just carried on as before.

The Doctor's Wife

The wives of the great majority of the married doctors are involved in duties connected with their husbands' practices. The most usual duties are the taking of messages and answering the telephone and door-bell. Some have a good deal to do in connexion with the practice. They may be concerned with the organization of the practice, with the arrangement of the visiting-list, and

with the filing of correspondence and reports. In short, some wives act as their husbands' secretaries.

A small proportion of wives are almost entirely free from the cares of the practice. This situation is usually found where a caretaker at the surgery takes all the messages and passes them on to the member of the partnership on duty.

Health Centres

Many practitioners are concerned about the way their wives are tied to the home because of the needs of the practice and the patients. A few of them expressed approval of health centres on this account alone. Forty-eight per cent. of practitioners approve of the health-centre idea, and 47% are opposed to it. In some country areas the question hardly applies, as it would be uneconomical to establish health centres in areas with only one or two doctors. A few say it would be good for towns but not for the country. Some favour health centres on account of the provision of diagnostic and ancillary facilities, and one, while not wanting a health centre, would welcome a diagnostic centre to which he could send his cases direct.

The arguments in favour are accentuation of difference between N.H.S. and private practice; development of group practice; better standard of practice; easier relief arrangements; sharing of nursing and clerical assistance; benefits, including improved ethics, from working together, and better accommodation. One practitioner thinks that there would be fewer attendances because it would be more like a hospital and patients are afraid of hospitals.

One doctor, not in favour, gives as his reason that health centres would be too like a hospital out-patient department. One speaks of the disadvantage to general practitioners who are not in the health centre, and another of the untoward effect upon the doctor with the small list when his patients see many more waiting to consult other general practitioners working in neighbouring rooms. Fears are expressed of having to "clock in" or to be controlled in other ways, of patients having to travel farther, and finding themselves beyond "pram-pushing" distance of the health centre. Some concern is expressed lest the practice in a health centre should lose something of its personal touch, that something valuable, yet intangible, would disappear from general practice and never reappear.

Many of the general practitioners are satisfied with their own arrangements, prefer to run their own show, and feel that the institution of health centres would not benefit the patients. One said he would prefer a general-practitioner hospital with consulting-rooms. This would enable close contact with the consultants to be established.

Opinion is almost equally divided on the desirability of health centres. I found no body of opinion which thought that the institution of health centres would be of much positive value to patients unless radiological and pathological facilities were provided. Most practitioners realize that the provision of such facilities, especially radiological, at each health centre housing, say, ten general practitioners would be so costly as to be grossly uneconomical.

(H) GENERAL PRACTICE AND THE N.H.S.

Over the whole range of practitioners visited I found 37% more satisfied and 42% less satisfied since the introduction of the N.H.S. Fifteen per cent. feel neither

one way nor the other, while 6% cannot give an opinion, not having had experience of practice before July, 1948. The percentage of those more satisfied is higher in the youngest age group and lower in the oldest. This finding is hardly in keeping with the inference that might be drawn from the chorus of voices heard and the letters written on the subject.

Those dissatisfied complain of the great pressure of work which prevents them doing all that is necessary for good practice. Two declare that the whole conception is bad; some feel that they would rather be paid for what they do, and object on these grounds. They consider that patients should have a financial interest in the use of the Service. Two or three say they are harassed by patients lodging complaints or by the fear of it. I found this fear cropping up now and again and playing quite a big part in making the general practitioner anxious. There are those who seem unable to put aside the feeling that the complaining patient may well hold in his hand the power of professional life or death for the general practitioner.

Then some, in fact most of those more satisfied, call attention to the fact that there are many things that need improvement or putting right. Some like the N.H.S. better because they can do more for their patients, can prescribe more freely, and can visit as necessary. Also there is no bother with bills now. The frequency with which I heard this matter of bills mentioned with relief suggests that the sending out of accounts was a major anxiety with many practitioners in the old days of private practice. Three express approval on the ground that the N.H.S. is better for the patient. I am satisfied that there are more who feel this too. The reply given by one practitioner is somewhat saddening: he likes the N.H.S. more because he does "not have to bother so much about the patients now."

One young practitioner likes the Service less, but, rather grudgingly, declares that it causes less worry and dissatisfaction than was expected.

Apart from these the remainder of the profession can be described as being receptive towards the N.H.S., ready to like it more and more. They are alert and critical of its shortcomings and often inadequate remuneration, and determined that a good service shall evolve, with full benefit for the patient and contentment for the general practitioner. The two things are not unrelated.

Size of Lists

Only one country doctor visited says he wishes to look after more than 3,000 patients in his practice. Seventy-six per cent. do not want more than 2,000. In the towns the number most popular (27%) is 2,500. Twenty-two per cent. prefer up to 3,000, while 13% are quite happy with 4,000. Some of these latter, apart from a slight concession to the country doctor, genuinely cannot understand how a doctor can be happy with less than 4,000 patients, or how he can find enough to occupy his time. In the practices I visited the distribution of the various sizes of list between practitioners was about the same in the town and the country. In the towns I found that 33% had lists larger than they felt they could deal with satisfactorily, in the country 26%. Forty-two per cent. of the town practitioners and 38% in the country have less than they can manage, while in both town and country about 27% have what they regard as the optimum number of patients.

There are many who are unshakable in their belief that no doctor can look after 4,000 patients in general practice, and 2,500 is the popular figure. I have on several occasions been privileged to witness at work practitioners with 4,000 patients, examining them with care, treating them with skill and enthusiasm, and maintaining friendly relations with them of the kind that is normally regarded as ideal as between doctor and patient. It is pleasant to record that some of these are young men who are doing fine work. They are giving their patients the full range of general-practitioner care, and managing them well. I have seen practitioners who have more patients than they can handle. Some admit it, declaring that they must have them to keep the home fires burning or the youngsters at school. I saw a few who seemed to show no sense of vocation. Their work was hurried and scanty, and there was no attempt to comfort the patient or relieve his anxiety. The concern of these few men seemed to be mainly the size of their lists and the resultant income.

One cannot be dogmatic about the number of patients a general practitioner can care for. Apart from the obvious difference between town and country, I thought I detected that in some areas the work is busier.

Excessive Demands

Nearly all the practitioners visited have among their patients a proportion, usually small, who are constantly at the surgery. Some of these are, of course, the chronic sick—the chronic bronchitics, the dyspeptics, the inadequate personalities, and the like. But there are also those who appear to be attracted to their doctor's surgery as if by a magnet. I saw one or two at least of these patients at nearly every surgery session through which I sat. Sometimes I could spot them myself, and at other times the practitioner would remark, after the patient's departure, "She's up here every week with some little thing or other." They are more commonly women. I was led to wonder, on occasion, what there was behind this urge to be under the doctor, this urge to be slightly ill.

I found very few complaints that could fairly be labelled frivolous. It was exceptional for even the trivial case not to have something wrong. The practitioners themselves are not always agreed on this point: whether, for example, it is unnecessary for the person with a common cold to attend the surgery. Obviously, with certain patients, it is a necessary precaution. The reason for quite a large proportion of "trivial" attendances is to get a prescription so that dressings or medications can be obtained free.*

Opinions on this subject vary widely. There are those practitioners who, sometimes harassed by overwork, seem too ready to find fault. The view was expressed to me that some general practitioners do not realize that there always have been, and always will be, a small proportion of calls that appear unnecessary. The following illustrates how opinions may vary on this matter. I was shown a list of surgery attendances over a period of several weeks, a third of which were marked as being considered unnecessary. But in the fairly lengthy surgery that I witnessed in this practice I felt that only a much smaller proportion could be so designated. Nor did I see such a high proportion as one-third in any other practice.

* The charge for prescriptions was not imposed until after the survey was concluded. It has since been announced that the number of prescriptions issued since the imposition of a charge has not diminished.

Of the truly frivolous I heard little and saw less. Sometimes, of course, although the call itself may be frivolous there is a genuine medical background. A schoolmaster sent for his general practitioner from the school at which he was teaching. On arrival the doctor was told: "I have lumbago and I want an injection so that I can go to the school concert to-night." It takes a good deal of consideration from other patients to counteract the irritation caused by such a call as this one. Almost universal is the experience that actual night (out-of-bed) calls are fewer, but that the number of calls received after the practitioner has set out on his round and also in the evening has substantially increased. Many practitioners, especially those in the fifties, complain that each night call becomes an increasing burden as the years go by.

Just under one-third of the practitioners consider they are subjected to an excessive number of unreasonable demands on their services. The remainder have no such complaint.

Effect of N.H.S. on General Practice

I was asked by the Committee to try to assess whether practitioners were laying the blame for any shortcomings on the N.H.S. when, in fact, the cause was to be found elsewhere. I did expect to find the N.H.S. made into something of a whipping-boy, but I found it so in the case of only about 14% of practitioners.

Lack of time is a frequent cry. It was not always borne out by what I saw of the operation of some practices, but it most definitely was in others. In a substantial number of practices lack of time has reduced the range of the service the practitioner can give to his patients. This is not to say that the patient is not receiving the treatment, for much of this work is now being carried out in hospital out-patient departments.

Of only one in five of the practitioners I saw did I think that their work was so hurried as to interfere at times with its quality. The majority will not allow this to happen. A sense of responsibility seemed to be lacking in only a very few instances. I noticed a tendency to pass cases to hospital which seemed to be excessive in 11% of practitioners. Only in 5% of cases did I find that the practitioner was prevented from indulging in short chats with the patients. Few, however, have much opportunity for more prolonged converse.

Fifty-eight per cent. of the practitioners say that they are working harder than they did before they joined the N.H.S. Thirty-two per cent. say that they are not. Many say that surgery attendances are greatly increased, but not the number of visits they have to pay. Some, having taken a partner, are working about as hard as formerly, which means that much more work is being done in the practice. A typical example is the practitioner who says that he used to have very little work in the summer—say, ten patients in the surgery and three to six visits a day. Now there are always more in the surgery, and he rarely pays fewer than ten visits a day in the summer. Another who says his surgery attendances have increased thinks that the opposite is the case with his visits, because formerly he had a subconscious tendency to overvisit, which the N.H.S. has cured. The amount of work entailed is very difficult to assess. One told me that the day of my visit was exceptionally busy. He saw 12 patients during morning surgery (there was another in the evening), and paid 15

visits. This was in the country, but it struck me as a reasonably comfortable day for any general practitioner. This practitioner, like some others, seems to approach his work in rather a leisurely manner and makes very heavy weather of it. He looked a tired man, and perhaps was. A number of practitioners told me, before I left, that the day of my visit had been "amazingly slack."

Frustration and Loss of Interest

Few human beings are perfectly happy and contented; similarly, few are free from worries and difficulties of some kind or other. Therefore to ask practitioners whether or not they suffered from frustration and loss of interest since the introduction of the N.H.S. was to ask for a gradation of replies.

Some say, "At times I get frustrated." Others mention specific causes of worry and frustration. The commonest is the difficulty in getting patients admitted to hospital. There is an undercurrent of feeling that the organization and administration of the N.H.S. proceed on their majestic way without due regard to the general practitioner or his patient. There is confusion, or there seems to be, regarding who should be blamed for the pin-pricks and the parsimony, for this is how many of them look at it. There is often criticism of their representatives, those who negotiate for them. I have heard more criticism of the profession's leaders than of those with whom they are negotiating.

Wherever the blame should properly lie, the fact that so much criticism abounds indicates that all is not well. Yet the majority (65%) have managed to adjust themselves, at least partially, to things as they are. Buoyed up, as in some cases, by hope of improvements, they have not allowed themselves to suffer from a sense of frustration and loss of interest. Twenty-eight per cent. say they do suffer. The remainder cannot make comparisons with pre-N.H.S. times.

One said talk of frustration was "a lot of rot." Others think general practice is "satisfying," although things are not quite as they would like them. Some bemoan the loss of hospital work, especially major surgery, and of access to pathological and radiological departments. The figures show only slight differences as between the three age groups. I saw one young practitioner who described himself as frustrated because he finds general practice insufficiently interesting academically. Another has lost interest and is thoroughly frustrated. He has been in practice only since July, 1948, but was unlucky in his choice of area, and he is frustrated and lacking in interest because things have not come up to his somewhat rosy expectations.

Questions of finance naturally entered into my conversations with practitioners on some matters, and a section on this aspect of general practice would have appeared in my report. Since the conclusion of the survey, however, the Danckwerts award and the recommendations of the Working Party have been announced. Consequently, to include any account of the views of the practitioners on the distribution of the pool and the methods of payment would now be pointless in the face of the considerable changes that have been effected.

(J) POSTGRADUATE TRAINING OF THE GENERAL PRACTITIONER

Fifty-three per cent. of the practitioners admit to having adequate local facilities for postgraduate training. The percentage in the towns is higher than that

in the country (61 to 34). Thirty-six per cent. say that occasional clinical meetings and lectures are open to them, by which is usually meant four or five a year. Two country doctors do not know what facilities are available to them. Ten per cent. say there are no facilities.

Forty-six per cent. of the practitioners use the facilities occasionally and 38% not at all. The remaining 16% avail themselves to a considerable extent, including attending a postgraduate course, sometimes a set of weekly meetings or lectures, sometimes a fortnight's course away. Some meet regularly with the consultants at the local hospital.

In one or two places I was told that local meetings have been few and far between or have been stopped owing to poor attendance.

There is no great difference in the use of the facilities as between town and country practitioners. The under-40 age group has the highest proportions of those availing themselves of opportunities for instruction. Seventy per cent. of them do so, at least occasionally. In the over-60 age group interest is comparatively poor. Some of them tell me that they are approaching the point when they will retire from practice, and have no enthusiasm for further information.

Many complain that they are too busy to attend, and many that times arranged for meetings are unsuitable. The consultant is said to show preference for the early evening, immediately following an afternoon session, while the general practitioner does not finish until later in the evening. Others say they are too tired in the evening. Evidently there is no ideal time. Then, again, some are unwilling to leave their practice for the time necessary for attendance at a meeting. These include the individualist and the practitioner who cannot come because he is single-handed and has no arrangements with other practitioners for the care of his patients in his absence. Some, of course, live too far away.

There are those who object to going to meetings only to be called away, and complain that this has only to happen once or twice for enthusiasm to be damped. Some are not interested, and others prefer to spend with their families any time they have to spare. Others are just disinclined to join in things, or are shy.

There is some criticism that the subject-matter of the lectures given by the consultants is too academic and too far removed from general practice. Conversely, I was told that the lectures are too simple and not interesting enough. To please more than a small proportion at a time would seem to be difficult. A number of those not interested in lectures say that they believe they can learn all they want from the material they see every day in their practices, and from their contact with the consultants at domiciliary visits. Some declare that they would be best suited by being allowed access to hospitals, where they could see cases under treatment and discuss them with the hospital staff.

Asked whether they would like different facilities for postgraduate training, very few said they would. Most of the requests are for arrangements for time off, especially to travel the longer distances, and for more meetings arranged at more suitable times. Some wish for more clinical meetings, and one suggested lectures by general practitioners on their problems.

Eleven per cent. read a great deal; that is to say, several periodicals and medical textbooks. Seventy per

cent. say they regularly read one or two medical periodicals. This usually includes a weekly and a monthly one. Eighteen per cent. read very little. These figures are fairly constant in the three age groups, with a tendency to rather less reading in the over-60 group. This tendency in this group runs approximately parallel to the interest in postgraduate courses and local clinical meetings and lectures.

A few complain of serious lack of time for reading. Many are pressed at times, but on the whole they are able to do some reading.

(K) A GENERAL IMPRESSION

The Practitioners Seen

The following table presents a picture of the group of practitioners selected, and shows the impression they made as general practitioners.

	Total	%	Class											
			1	2	3	4	5	6	7	8	9	10	11	12
Good ..	81	44	7	10	4	16	12	3	4	7	—	4	11	3
Adequate ..	82	44	3	19	2	12	17	5	1	8	2	3	5	5
Inadequate ..	14	7	1	2	2	2	4	1	—	—	1	—	—	—
No assessment	11	5	1	1	2	2	1	—	2	1	—	—	1	—
	188		12	32	10	32	34	9	7	16	3	7	17	9

	Town	Country	Age Groups		
			25-39	40-59	60+
Good ..	52 40%	29 49%	31 53%	40 40%	10 32%
Adequate ..	58 45%	24 41%	19 33%	49 50%	14 45%
Inadequate ..	12 9%	2 3%	3 5%	6 6%	5 16%
No assessment	7 6%	4 7%	5 9%	4 4%	2 6%
	129	59	58	99	31

This is a summing-up of the quality of service that was, in my judgment, available to patients from their general practitioners. Tables which show that no less than 92% of the practitioners whose work was witnessed were adequate or better than adequate may come as a surprise after reading some of the paragraphs of this report. The apparent discrepancy is due to the emphasis necessarily placed upon faults and shortcomings because of the critical approach to the survey.

Perhaps the most difficult and invidious part of an observer's task is to sum up fairly. He must be fair both to those to whom he reports and to those on whom he is reporting. In retrospect I can say that I did not find the assessment as difficult as I expected. The easiest practitioners to assess are the good ones. They nearly always gave an immediately good impression, which remained confirmed at the end of the day. I did not assess any practitioner as inadequate without substantial evidence. Four per cent. of the practitioners declined to allow me to watch them at work, or I was prevented for other reasons. For example, three practitioners with small practices had no patients to see on the day of my visit.

In the category "good" I placed those practitioners whose skill was evident and whom I found exercising a constant care and thoroughness with every patient, a keen appreciation of the whole man in the patient, together with a friendliness and spirit of kindness and helpfulness. This is not to say that these qualities do not exist in those classified as "adequate," but the standard I set was high. In these others, such qualities

are not present to so high a degree. It has been a privilege to watch these men and women at work. It has been an inspiration to witness in a special few the enthusiasm they have for their work and the constant vigilance they exercise to maintain their standard of excellence.

I have, of course, seen a wide range of personalities. At the other end of the scale there is the practitioner whose sole object appears to be to "get through" his patients with as much dispatch as possible, and to limit services given to the bare essentials. He does not, as a rule, appear to give satisfaction to his patients. He supplies them with a bottle of medicine, and that quickly. He is rarely concerned with anything below a full list, and would, I believe, prefer to give the service he is giving to a large number of patients than offer a wider and more thorough range of service to a smaller number for the same remuneration.

Then there is the man who has in him some of the necessary characteristics, but who has allowed increased pressure of work to weigh him down to such an extent that the service he gives is below what would otherwise be, and probably was formerly, his normal standard. He has allowed his conscience to be stilled by "increased demands."

Ninety-two per cent. of practitioners seen at work were adequate or something better. Some were harassed by a considerable amount of overwork and sometimes by financial anxieties. Such men do not readily reduce their standards, and have sought, rather, to limit their responsibilities. They tend to send to hospital cases requiring minor procedures which formerly, having time, they would have undertaken themselves. Within the limited field to which these have withdrawn, their work is adequate.

For every general practitioner that I class as inadequate there are 10 who are, in my view, adequate. Half of these, that is 44% of the general practitioners (46% of those I saw at work), are good.

I came away from the survey with three major adverse impressions, which are summarized below.

Lack of Cohesion

My foremost impression is that of lack of unity in the N.H.S. and lack of unity in the medical profession. Both of these are jeopardizing the status and the effectiveness of general practice.

I became aware, early on, that unless certain gaps are closed the patient will not derive maximum benefit from the Service.

The human gaps must be closed. The general practitioner, the consultant, and the public health medical officer need to get to know each other and then to learn to work in concert. There is growing up a new generation of consultants, and a still newer one of those who will become consultants. These know little of the general practitioner and are unaware of his difficulties. Neither are they aware how easily these difficulties may be increased. Then the public health service and the general-practitioner service seem to be treading different paths. Where their paths meet there is often doubt and misunderstanding.

The other gaps are administrative. Maximum benefit for the patient cannot result from a trisected service. The feeling I derived from the survey was that bridging the gaps with liaison committees seemed less likely to be the cure than local co-operative effort. I cannot rid

myself of the feeling that the gaps must be filled completely. The N.H.S. is crying out for a unified administration.

Inadequacy of Hospital Services

The hospital services are causing considerable anxiety to the general practitioners in their attempts to obtain treatment for their patients. Hospitals are still contending with a back-log of operations and a more health-conscious public, resulting in increased demands. The aged and the chronic sick are poorly provided for.

Steps to enlarge the scope of general practice might well be the means of easing the load on the hospitals. Better access to radiological and pathological facilities, and general-practitioner beds, would encourage and help the majority of general practitioners.

Increased Demand for Services

At the time of the survey some practitioners were faced with so many demands on their services that they were unable to give the time that was necessary or that they would have wished to give to each case, even the trivial ones.

Much has been heard of the need to reduce the demands by patients on their practitioners. Methods of eliminating unnecessary demands are being sought. From my own observations, and in the opinion of the majority of doctors, the number of frivolous calls is small. On the other hand, the number of calls that might be regarded as trivial is much larger.

What is trivial to a doctor is possibly a matter of anxious importance to a patient. Formerly the question of finance overrode much of this anxiety.

Often the trivial call is a means of obtaining a prescription for something which formerly the patient would have bought from the chemist. The idea that the public are entitled to such medicines from the N.H.S. is now deep-rooted. Apart from the possibility that the token charge for prescriptions will alter it, the demand seems likely to continue at approximately its present level.

The extent of this extra demand means a great deal to some practitioners and affects others but little. Some practitioners are harassed by the amount of work, sometimes of an unsatisfying nature.

At the time of the survey there seemed to be room for a review of the quantity of work to be carried out by the general practitioner in the N.H.S. To advocate any further compulsory reduction in lists does not come easily to one who has seen, as I have, a number of practitioners dealing, single-handed, with a full list and giving a thoroughly good service to all patients.

There seem to be two courses for general practice to take. The first is to make such adjustments to meet the new situation as will stimulate clinical interest anew and give scope for its exercise. The other course is towards the impersonal health service. Some fear the evolution of general practice into some sort of a glorified hospital out-patient department where intimate knowledge of the patient, continuity of treatment, and the idea of the doctor as guide, philosopher, and friend are sacrificed to a hurried impersonal machine. It is for this reason that they express disapproval of the idea of health centres.

A number of practitioners expressed their sensation of being dragged down to a lower level, a feeling of being disregarded and in bondage.

THE PRACTITIONER AND THE HOSPITAL SERVICE*

BY

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Greek and Roman hospitals were little more than hostels in association with the temples, designed to give rest and shelter to pilgrims visiting the shrine, many of whom were sick men. Constantine, the first Christian emperor, closed the pagan hospitals, and thereafter the care of the sick was undertaken as a Christian duty by the monasteries. The oldest hospital in Britain is St. Bartholomew's of Rochester, which was founded in 1078. St. Bartholomew's, Smithfield, and St. Thomas's, Southwark, followed shortly afterwards. These were religious institutions in which the sick were cared for by the monks and nuns of the Order, and in time similar hospitals grew up in association with all the main Orders.

When Henry VIII suppressed the monasteries between 1536 and 1540, most of the hospitals then in existence closed. In London St. Bartholomew's, St. Thomas's, and Bedlam remained, but it cannot be claimed that the few beds these provided and the kind of treatment they were able to offer did more than segregate a few of those suffering from the more revolting diseases, such as leprosy and syphilis and madness, from the gaze of their fellow citizens. There was no hospital treatment in the sense of a service of advice and treatment available to those who needed it. The sick were looked after at home and they got well or died at home, unless they had no home and no friends, when they died in the streets. There was no doctoring, for such men as had a medical training and had been given a licence to practise plied their trade among the nobility and the wealthy. The great mass of the people turned for advice and treatment to unlettered quacks, men who had acquired a shrewd practical outlook and a little more knowledge than their neighbours of the herbs and manipulations of folklore, and who handed out the traditional concoctions and incantations of the alchemist.

A New Spirit

Quite suddenly, and for reasons that are difficult to assess, a new spirit was born at the beginning of the eighteenth century. Led by Sydenham and Boerhaave, medicine was transformed from an abstract philosophy to a scientific study concerned with the causes and treatment of disease. Doctors left the library and the debating chamber to sit by the bedside, to record what they saw rather than argue what ought to or might happen. Men in all walks of life became concerned with their responsibilities as well as their privileges, and found a new interest in seeking to help those who were poor or in trouble. One expression of this new medical outlook and this new spirit of philanthropy was the founding of secular hospitals. Westminster Hospital was founded in 1719, Guy's Hospital in 1725, and before the end of the century eleven new hospitals had been founded in London, thirty-seven in provincial cities, and nine in Scotland.

The movement continued apace. By 1925 there were 909 voluntary hospitals in Britain providing 60,000 beds.

*A B.M.A. Lecture given to the Ayrshire Division on April 12, 1953.

In 1870 hospitals of another class, designed not to provide curative treatment but to care for the aged, the helpless, and the chronic sick, were founded by local authorities under the Poor Law, and by 1925 they provided beds greatly in excess of those in the voluntary hospitals and were undertaking all forms of medical and surgical treatment. The first cottage hospital was built in Cranleigh in 1852. Others of the same type—that is, institutions with from five to thirty beds serving the needs of a small area—appeared in rapid succession. Many were founded as memorials after the first world war. By 1925 there were few towns in Britain with a population of 2,000 or over that did not possess such a hospital.

These hospitals were all established and maintained for a similar purpose, to care for those who, because of the nature of their ailment or their own poverty, could not be looked after at home. Those who were wealthy and had comfortable homes never went to hospitals. They retired to their own bed or in some cases to a convenient room specially prepared as a sick-room. Any treatment, such as cupping, bleeding, or leeching, was carried out by their practitioner. If an operation were needed it was performed by him on a wooden table by the light of lamps held by the domestic staff. There was no essential separation between the doctor who looked after the patient at home and the doctor who looked after him in hospital; indeed, the words "consultant" and "specialist" were unused till the present century. There were no special degrees or diplomas. Practitioners were seeing the same cases, using the same methods of investigation, giving the same treatment, doing the same operations, and using the same language as members of the hospital staff.

An appointment to the staff of a teaching hospital brought with it the privilege of teaching students and thereby training a series of practitioners who would usually call on their old chief for help when faced with a difficult case, or when attending a wealthy or exacting patient. An appointment to a provincial hospital brought with it a certain prestige. Many of these men added to the sum of knowledge by their observations and researches on the nature of disease, and established international reputations by their writings, but they differed from their colleagues, the family doctors, in achievement rather than in kind. Right up to the beginning of the first world war the majority of physicians on the staff of the London teaching hospitals were what to-day would be called fashionable West End general practitioners, who, in addition, saw the patients of other doctors in consultation. General practitioners were constantly in touch with their old teaching hospital, or the hospital of the district in which they practised. They called upon their old chiefs, they attended ward rounds and took part in the discussions, they went to lectures, and they watched operations. The suggestion that doctors in hospital and doctors in general practice inhabited separate worlds would then have been unthinkable.

A New Principle in Treatment

The separation of the general practitioner from the hospital began in the closing years of the nineteenth century. With the notification of infectious diseases, and their treatment in isolation hospitals, a new principle was established, that certain illnesses may no longer be treated in the patient's home by his own doctor. About the same time investigation of diseases began to pass from examination by the ordinary clinical methods, amplified by simple chemical

tests and the use of instruments easily mastered. Radiology and bacteriology appeared, and soon became essential to the study of many problems. They demanded apparatus, laboratories, and equipment that could be supplied and applied adequately only in hospital. The bedside tests of the early part of the century rapidly multiplied into the new science of clinical pathology, which in turn became further subdivided into clinical microscopy, biochemistry, and haematology. The optical instruments designed for the indirect inspection of cavities demanded increasing skill and experience. As information accumulated, as disease groups were disentangled into separate entities and new diseases were discovered, a gradual change appeared in the orientation of hospitals, particularly the teaching hospitals. They were no longer places for treating the sick, but places for research into the cause of disease. Rare diseases were given precedence over ailments of economic importance. Groups of patients were segregated for study. Experimental medicine raised its head. Practitioners, on the other hand, became more and more loaded with non-medical tasks, with certificates for the avoidance of duties and the securing of luxuries.

By the end of the 1914-18 war consultants were a race apart, and special degrees and diplomas, specialist associations, and specialist journals appeared to separate them from their fellows and to indicate the particular sect to which they belonged.

We have seen that in the teaching hospitals, which were becoming more concerned with investigating the unusual rather than treating the important, the general practitioner had become virtually excluded. In the council hospitals, which were rapidly assuming responsibility for the routine treatment of disease, the practitioner was able to have his cases admitted more readily without the somewhat humiliating argument with a recently qualified house officer, but he was equally unable to take any part in their subsequent treatment.

It is necessary at this point to refer to another tendency. With the elaboration of methods of treatment, and particularly with the increasing enterprise, safety, and success of surgical operations, it was becoming apparent that no private house, however well appointed, could offer the facilities for asepsis and for nursing that could be given in a specially designed building. First appeared nursing-homes, many of them built by consultants or groups of consultants to offer to their private patients a service approaching that which their hospital patients had enjoyed for some time. Then, as methods grew more elaborate and the standard demanded still higher, it became obvious that only in a hospital with its attached scientific departments and its resident staff could the highest level of treatment be attained. First private rooms intended for patients of moderate means unable to afford nursing-home fees were added to the ward units, and then whole private wings or private blocks were presented by charitable donors. In these blocks there was no means test. The increasing tendency for all but the simplest treatment, including that of such physiological events as normal labour, to be conducted in the precincts of a hospital brought a further separation between the practitioner and the consultant that was not at first appreciated. It removed the practitioner from the interest and the emoluments of caring for his patients when they became seriously ill, and it gave the consultant attached to a hospital equipped with private beds an automatic increase in income that he did not necessarily deserve.

A Disastrous Barrier

As a direct result of the complete separation of the general practitioner from the hospital, there had developed in many cottage hospitals and in some voluntary hospitals in the smaller towns a policy of excluding all but general practitioners. Such a policy, which was quite frankly mercenary, and had for its main object the retention among a local group of the emoluments and benefits of the private beds, was to a large extent responsible for the artificial and,

as it turned out, disastrous barrier erected by the National Health Service Act between the practitioners and the hospitals. I will cite the imaginary town of X, situated in lovely country at a distance of thirty miles from the manufacturing city and university town of Y. With the development of motor transport X had become a dormitory, where all the wealthy men who earn their money in Y had their country houses. The X War Memorial Hospital was their particular pride. Its buildings were the latest thing in hospital architecture; its equipment was the best that money could buy. Two of the hospital rules were significant. First, that no one might be elected to the hospital staff till he had been in practice in the neighbourhood for a minimum of five years; and, second, that no patient might be treated except by a member of the staff. The first rule excluded anyone with higher degrees, or at any rate with adequate postgraduate training, from appointment to the staff; in practice it meant that staff appointments were for sale, since the purchase of a partnership often included a guarantee of such an appointment. The second rule denied to patients treatment by experts of their own choice—indeed, treatment by experts at all if an expert be defined as one who has made a whole-time study of the art that he practises.

The standard of work in hospitals of the type I have mentioned was in some instances quite deplorable, particularly where surgery was concerned. In the view of many at the time the Act was under discussion, the occurrence of disasters amply justified the closing of cottage hospitals. How wrong this opinion was we have since learned to our cost.

The National Health Service

The final and official segregation came with the National Health Service Act. After July, 1948, the medical profession was split into categories, defined with the verbose exactness of the Civil Servant. Each man, after qualification, preregistration employment, and national service, must enter or be herded into one of several pens, and within that pen he must live until he dies or retires. Of these pens, the lowest is that of general practice. General practice was artificially debased. The general practitioner was made a shuffler of patients' cards, a signer of certificates, a distributor of benefits, a treater of minor ailments within strictly defined limits and with strictly specified remedies, a stooge with a twenty-four-hour working day, liable to be victimized by trivial complaints but forbidden to complain himself. The specialist was artificially elevated. All citizens may demand specialist treatment, therefore specialists must be turned out to fill the demand. We are now in a ridiculous position where a well-trained and competent doctor is forced to refer his patient to a man of lesser ability but marked with the correct rubber stamp, in order that he may carry out treatment that he himself could do very much better. Hospitals have accumulated unmanageable waiting-lists because their beds are blocked by patients undergoing treatment that could very well have been carried out at home, by patients admitted for investigations that the practitioner could have conducted himself had he been granted x-ray and laboratory facilities, and by patients retained merely through the fear of litigation bred by a series of legal decisions that seem to have been given on the simple working rule that the doctor is always wrong.

We have now had five years of experience of the National Health Service. Whatever benefits it may have conferred on the health of the nation, on the hospitals, or on the specialists, its effect on the spiritual side of general practice has been disastrous. I cannot express this better than by quoting the *Medical World Newsletter* of August 16, 1951.

"After undergraduate and formative years of intimate and enthusiastic participation in the whole range of hospital work, and of satisfying and stimulating membership of the hospital team, to enter general practice is to have crossed the professional Rubicon. There is no way back. New and compelling forces and alien but seemingly accepted influences gradually exert their deteriorating and irresistible effects. Idealism and enthusiasm wane in the face of expediency. Clinical disciplines and scientific

methods are weakened and worsened by pressure of economic necessity. Many different factors are responsible for the present unhappy mood in the great body of family doctors, but it is probably fair to say that none is more culpable than the gradual and now almost complete exclusion of the general practitioner from the hospital services."

A Short-sighted Policy

At the time that the chasm started to appear between consultant practice and general practice, the consultant was a man whose interests covered the whole of medicine or the whole of surgery and who had earned his position by some special aptitude of knowledge, wisdom, or technical skill. To-day the term "specialist" is usually used in place of "consultant," and the change of title corresponds to a significant change in training and outlook. The specialist knows a great deal about a small aspect of medicine or surgery. In acquiring detailed knowledge he has lost breadth of vision; in fact, he has become a technician to be employed rather than a wise man to be consulted. There is all the greater need to-day for general physicians, men who can survey a clinical problem as a whole and can from that survey decide which of the many brands of technicians shall be employed to confirm the tentative diagnosis or apply the appropriate treatment. General medicine to-day is passing into the hands of the general practitioner, and it is of paramount importance that his training should be as thorough as possible, and that he should be allowed to continue it through life.

In considering the relationship of the general practitioner to the hospital we must bear in mind three separate aspects of the problem—the education of the student, the training of the postgraduate, and the care of the patient.

Education of the Student

The training of the student is, and always must be, the business of the teaching hospitals, but we have every right to ask them in all seriousness if they know their business. Are they teaching their students the broad principles of medicine and surgery, and training them to look after the sick, or are they wasting their time by showing them diseases they will never encounter, discussing theories that may never come to anything, or talking of research projects that may or may not lead to something in the generation after next? It is the working doctors who care for the sick, but it is the professors who plan curricula and who have the ears of the Government. To a professor there is something slightly indecent and degrading about the care of sick men, yet he decides the manner in which those doomed to this menial task shall be educated. The Government, desirous to reform the training of doctors, appointed the Goodenough Committee to study the problem. Sir William Goodenough was a business man. He was helped by ten very eminent gentlemen, all doctors in the sense that they were on the *Medical Register*. Seven were professors of academic subjects who had never attended a patient since they left hospital. Three were consultants. None were practitioners. The Goodenough Report, as might have been expected, reeks of academism, and succeeded in adding still further to the burdens of the student's training while taking it still further from the needs of his future vocation.

There is a great need to-day to remember that we are teaching men to be doctors. They do not need to be, and they should not be, taught physiology and anatomy as scientific subjects, but as the groundwork of their future study of medicine and surgery. If they wish to become physiologists or anatomists rather than doctors, that is a matter for postgraduate study. They do not need to be grounded in research. What should concern them is not what lies beyond the frontiers of knowledge, but what is already known; to that they can later add the results of research when these have passed from the realm of speculation to that of tested knowledge. They do not need to know more of rare diseases than that they exist, their main outlines, and the place where further information may be

found if it is required. They do not need to study operative technique, but they must know all about the diagnosis of the surgical emergencies and they must know what modern surgery has to offer in the treatment of disease. They need not have more than a passing acquaintance with the specialties, except for midwifery, paediatrics, and dermatology. But they must be taught far more than they know now about the psychology of the normal, about the infectious diseases, about the surgery of trauma and infection, about industrial diseases, about minor maladies, about sex relationships, family planning, and the day-to-day adjustments of married life, and about the legal obligations of the practitioner.

An attempt is already being made in some medical schools, notably in the Universities of Edinburgh and in London—at St. Bartholomew's, St. Mary's, and Charing Cross Hospitals—to give the students before qualification an introduction into general practice, the specialty which most of them will follow and with whose main outlines they should all be familiar. Before long a general practitioner, or a group of general practitioners working in relays, will be appointed to the staff of every teaching hospital. The logical delivery from the morass in which medical education is now floundering is that the training and examination of the future doctor should be taken from the colleges, who no longer represent medicine or surgery but rather groups of highly specialized technicians, and from the universities, whose examinations represent a parochial rather than a national standard, and handed over to a board on which general practitioners are largely represented. The curriculum that would be evolved by such a group would be better than the present one, for it would deal with basic sciences and basic principles, rather than with the fads of the moment or the fancies of the future. It would be shorter—five years should be ample—and would therefore leave more time for specialized postgraduate study. It would turn out men trained to use their five senses to examine and their minds to apply the lessons of experience to the series of problems that would confront them through their working lives.

Training of the Postgraduate

The second aspect of the relationship between the hospital and the practitioner concerns postgraduate education, though in this respect what is wanted is co-operation rather than education. The general practitioner is overworked. He has few professional contacts. He has little time to read. For fifty years after qualification he will be practising an art that is constantly changing, and if he is to continue to practise it successfully he must be able to learn of those changes, and to discuss with others the problems that have faced him.

For the newly qualified a further period of hospital work with added freedom and responsibilities is essential. An advantage of the Health Act is that it should make possible an eventual grouping of the hospitals in a region that will benefit both the teachers and the taught. In the past hospitals have fallen into two main categories: those with many students and inadequate clinical material, and those with abundant clinical material and no students. In the future we may hope that the students will spend part of their training in other hospitals than their parent one, where, with plenty of patients to examine and fresh viewpoints to study, they will learn more than they could in surroundings that have become familiar. I foresee a time when a teaching unit will contain 5,000 beds rather than the 500 to 1,000 it does now, when none but the senior physicians and surgeons will be permanently attached to the parent hospital, when students, registrars, and the junior consultants will serve for periods in various hospitals in the group, and when the teaching will be spread over a wide panel and be available to undergraduate and postgraduate alike.

But, apart altogether from formal postgraduate training and periodic refresher courses which practitioners may attend if they wish, it is essential that the sharp cleft that has appeared within our own time between consultant and

general practice should be filled in, and that the practitioners of a district should be made to feel that they belong to the hospitals of their district and that the hospitals belong to them. At present, in many instances, the only contact is a hastily scribbled note asking for information that the doctor could easily obtain if he had the facilities, and a hastily dictated and stereotyped reply received some days later. Many suggestions have been made how this situation might be improved.

Each hospital should keep a record of all the doctors in the district from which it draws its patients. It should treat them as the Royal Society of Medicine treats its Fellows, sending to each a monthly announcement of coming activities, of such fixtures as tumour clinics, cardiac discussions, and clinical lectures, in which he might be interested. It should make it clear to practitioners that they are really welcome, and teach those twin menaces to co-operation—the soured sister and the bumptious houseman—better manners. It should specially welcome them at ward rounds where their own cases are being discussed; indeed, it might well arrange that of the two weekly rounds one should be for students, the other in the first place for postgraduates and visiting practitioners. It should ensure that practitioners are welcome,*not alone in the wards but in the departments. A reception once or twice a year at which consultants and practitioners could meet on a social rather than a professional basis, and a practitioners' common room where they could meet each other and where some of the textbooks and journals not usually in the practitioner's own library could be consulted, would go far to encourage the spirit of camaraderie.

A further method of bringing the general practitioner into closer contact with the hospital is by clinical assistantships, a scheme in which the Barnet Group Hospital Management Committee has been a pioneer in the London area. At the Barnet General Hospital six general practitioners are appointed to six clinical assistantships—two in medicine, and one each in surgery, obstetrics and gynaecology, dermatology, and paediatrics. The appointments are for a period of six months, which may be extended to twelve. The grading is registrar (part-time), and the clinical assistant attends two sessions a week. The scheme has proved most satisfactory. The practitioners value the educational and clinical contacts and get a better understanding of the internal workings of the hospital and appreciate its difficulties. This, in turn, brings about a better relationship between the hospital and outside general practitioners. The system of clinical assistantship is being extended to other hospitals in the Barnet Group.

Care of the Patient

The third aspect of the relationship between hospitals and doctors concerns the care of the patient. At the present time much of the educative value of practice is lost to the practitioner because he is unable to pursue his investigations to the point where a firm diagnosis is possible, or to treat his patients when they require nursing. On the other hand, the hospitals are inundated with cases of a comparatively trivial nature that the practitioner should have treated, and in examinations that he could just as well have made himself. The answer lies in the provision of general-practitioner beds.

The ideal arrangement in theory, that the practitioner should continue in charge of his patient after he has entered hospital as he did before, is unfortunately impossible in any large hospital for administrative reasons. The doctor's visit forms quite a small part of the work of a ward. Patients must be wakened, washed, and fed, beds must be made, temperatures and pulses must be taken, medicines must be administered, closed periods for bed-pans and visits to the lavatory must be instituted at frequent intervals. The superintendent, the matron, the honorary, the registrar, and the houseman must all make their rounds. Physiotherapists, occupational therapists, clinical chemists, dietitians, clerks, and photographers all come in to practise their particular

trade. Visitors bring noise, chaos, and mess for a couple of hours a day. In a teaching hospital ward rounds intrude, in a non-teaching hospital the turnover of fresh cases and the number of minor treatments is much greater. It is clear that in such hospitals the nursing staff cannot possibly cope with simultaneous visits by eight or ten different doctors. In such circumstances attendance by the practitioner at a ward round when his patient is being discussed provides the only practicable form of liaison.

It is possible that specific beds may be allotted to general practitioners in a large hospital, or that a ward may be set aside for their use, but the difficulties of blending such a unit with the work of the rest of the hospital are almost insuperable. A preferable solution is the general-practitioner hospital or the cottage hospital.

Cottage hospitals were under a cloud at the time of the passing of the National Health Service Act; but those who decided somewhat hastily to close them forgot that the treatment of illness is often more psychological than physical, that confidence and equanimity are the first stage to recovery, and that sick folk will get well in familiar surroundings, near their homes, in touch with their families, and cared for by doctors and nurses they know, when they would pine in the chill antiseptic surroundings of a large distant hospital subjected to the skilled but impersonal attentions of strangers. Cottage hospitals had suffered in reputation chiefly because of the incompetent surgery that was performed in some of them. Admirable institutions were condemned because of the faults of some men who worked in them. These faults will not be repeated now, and the cottage or district hospital, properly run, should provide in every local community lacking a general hospital the answer to the relationship between practitioner and hospital.

The size of a cottage hospital is open to debate, but thirty beds is about the smallest unit that will justify the addition of an x-ray unit and a clinical laboratory, both of which are essential to efficient work. There should be a consulting staff consisting at any rate of a physician, a surgeon, and a gynaecologist working at a neighbouring general hospital, and each of these should make a regular weekly visit, and attend at other times if required to do so. The x-ray plant and the laboratory should be in charge of whole- or part-time technicians, but a consulting radiologist and pathologist should supervise the work. Whether all the practitioners in the neighbourhood are on the staff or only a limited number is a matter for local arrangement.

On the one hand, a smaller staff make for easier administration. On the other hand, no practitioner should be obliged to hand over his patients to rivals, which means that anyone in single-handed practice must have the right to admit patients. In most cases a rule that doctors become eligible for election only when they have practised in the district for five years will allow each firm to be represented.

In such hospitals practitioners will be able to investigate and to treat their own patients, referring to the central hospitals only those presenting unusual difficulty in diagnosis or calling for unusual skill in treatment. In deciding upon a line of treatment it must not be forgotten that it is a principle of the National Health Service Act that every in-patient or out-patient should have the advantage of the advice of the appropriate consultant. Any practitioner can perform minor operations, or ones of greater scope, but it would be well that he should do so with the knowledge and approval of the consultant surgeon to the hospital, and preferably that he should have held the post of clinical assistant to him. In the case of litigation, a practitioner who had operated on his own responsibility without taking advantage of the advice available to him would probably be held liable for any untoward results.

The health centre is not as yet anything more than a glorious dream in the minds of the planners. It has never been exactly defined, but in essence it is a place where doctors of a neighbourhood, by working in a building specially planned for the purpose, can enjoy the advantage of communal

facilities in waiting-rooms, secretarial assistance, and accessory methods of investigation, can see their patients in consulting-rooms designed as such, and can consult each other or the representatives of the public health services, who work in adjacent premises. In many ways the health centre is to the cottage hospital what the out-patient department is to the general hospital, and there are many advantages in placing the two in proximity, though not in the same building. The secretarial and filing staff, the offices of the local health authorities, and the group premises of several firms of practitioners working in rivalry do not fit in with the conception of a hospital, but the need in the health centre for x-ray and laboratory facilities demands proximity. The ideal arrangement would be a separate building in the same grounds, or at any rate in the same street.

Conclusion

Finally, the domiciliary consultation is one of the beneficent provisions of the Act that cannot be used too often. Better than its sister Mercy, it blesses three people—him that asks, him that gives, and him that takes. It helps the practitioner because it enables him to meet the consultant man to man over a live problem, to put all those small points and difficulties that cannot be put in a letter, to set out the personal as well as the medical aspects, if need be to call his bluff and insist on simple instructions in plain English. It helps the consultant because it gives him the opportunity seldom offered in hospital, to study a patient rather than a case, and to appreciate the difficulties with which the practitioner must contend. It helps the patient because it brings Harley Street to his bedroom, and cuts out the fatiguing journey and the long wait of a visit to hospital.

What, then, is the ideal relationship of the practitioner to the hospital? The ideal relationship is one of the friendliest possible contact, of the closest possible co-operation.

The consultant and the practitioner are both men trained in the same basic sciences and working for the same end. They have been parted by the increasing complexity of modern medicine. They have been forced further apart by some of the unintended and unexpected consequences of the new Act. Both are overworked. Both tend to assume a superior attitude which is really an inferiority complex with the bristles out. But both can work together if they try, and the first thing is that they should come together.

GENERAL PRACTICE AND THE HOSPITAL*

BY

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There seem to be many people who claim—and, for all I know, believe—that all the ills from which British medicine suffers to-day had an acute onset on July 5, 1948. This, however, is to forget that all illness must be examined in the light of the previous history of the patient, predisposing factors, and environment. Changes in social and political climate, medical development, and the accelerated advance of knowledge are all important considerations in the diagnosis and treatment of the ailments of the body and mind of medicine. The chronically precarious financial state of the old voluntary hospitals, the burden on the local rates which the development of the municipal hospitals caused, the rise in the cost to the patient of so many medical services in this

*An address given at the Glasgow Office of the British Medical Association on April 1, 1953.

increasingly complex world contributed their important shares to the drastic experiment initiated five years ago. It is not my purpose either to defend or to condemn the experiment, but rather to offer some thoughts on the problem of rehabilitation, with particular reference to the association of general practice with the hospitals.

During the past 30 or more years there has been an obvious change in hospital staffs. Whereas formerly many, perhaps originally all, senior members of hospital staffs worked as general practitioners for much of their time, now almost none do, and I sense a general attitude that this is as it should be.

This development is usually attributed to the increasing specialization which has been so obvious in the same period. There is doubtless substance in this claim, especially in respect of surgeons, but I do not think the advance of specialization is the whole reason in the case of non-surgical staffs. In Scotland the general physician—that is, the consultant who tries to survey the whole field of internal medicine—is still fighting a successful rear-guard action for survival against the forces of narrow specialism which are dominant elsewhere. However, the ever-increasing number and complexity of diagnostic and therapeutic techniques have influenced the pattern of hospital staffing, for the development of these techniques is inevitably a hospital matter, and therefore expertness—that is, specialism in their uses—is first acquired by the hospital staffs, and the hospital physician acquires skill which the doctor working outside hospital has little chance of attaining, or at any rate can do so only much later. More and more, therefore, the hospital physician has devoted his time to applying these special skills and the experience gained in their application even while still trying to maintain a wide general outlook.

Also the financial and social eminence attainable, at any rate in former days, by top-flight consultants has attracted men into purely hospital and consultant work divorced from the rough and tumble of general family practice.

Hospital Staff and Domiciliary Practice

Be the explanations what they may, we were already, long before the last war, faced with the fact that the general hospitals were for the most part staffed by men who were not engaged in general practice, and indeed in many cases, to their detriment, never had been. This trend has continued, and has probably been accelerated by the war and by the introduction of the National Health Service, so that now there are very few G.P.s on general hospital staffs, and the idea is prevalent that none need apply. The almost universal practice of appointing junior staff—that is, registrars, senior registrars, and others—to whole-time appointments, and the difficulties in the way of any two-way traffic between general and hospital practice, are already breeding a race of young consultants who have not only no experience of general family practice but very little of domiciliary practice of any kind. To my mind this is one of the gravest defects of the Service, since, in the future, consultants will lack a vital element in their training—namely, the experience of attending people in their own personal and domestic environments, experience which contributes so much to the making of a good doctor, and lack of which accentuates the danger of the development of an impersonal and mechanistic approach to what are, after all, intensely human problems.

Since the clinical teaching of undergraduates is almost entirely confined to members of hospital staffs, their increasing lack of experience in family and domiciliary practice

has a harmful effect on the vocational training of the young doctor, which the trainee-assistant scheme does not wholly eliminate.

The absence of practice experience on the part of hospital staffs and the prevalent absence of hospital experience (beyond that acquired in house appointments) on the part of general practitioners have created and are steadily accentuating a cleavage between these two branches of the profession. This cleavage is unfortunate enough in itself, but, unhappily, it is associated with a tendency for one section to lose its respect for the other. The hospital man looks down from his rarefied pinnacle on those who are "only G.P.s" as a quite inferior form of life, and the G.P. regards the hospital man as a "test-tube doctor" who can do little without his laboratory and his investigations and whose advice in the end may be anything from a pronouncement as from Jehovah to the wildest impracticability.

There is nothing to be gained by denying that bad work is done in general practice, since doctors are only human and their qualities and knowledge vary almost infinitely. Equally, and for the same reason, we must recognize that much bad work is done in hospitals. However, we should not legislate only for the bad but also, and more importantly, for the good and the average.

All these are matters which cannot be ameliorated overnight by any administrative action. Improvement can be achieved only by improvement in the climate in which medicine is practised, involving the medical undergraduate curriculum, the qualities and attitudes of the teachers, and the provisions for suitable postgraduate training, as well as the administrative framework. Of educational matters I would only say that vigorous thought, self-criticism, discussion, and experiment are prevalent throughout the profession to an extent greater, I think, than ever before. A healthy portent of things to come.

Administration and Organization

I wish to examine some aspects of the administrative and organizational side of this problem. On the question of the staffing of the general hospitals, teaching and non-teaching, we must not adopt a Canute-like attitude and call for a halt to the tide of specialism and the development of new techniques. For one thing, the tide is probably irresistible, and, for another, if progress were to stop regression would quickly follow into empiricism and superstition, of which indeed there is still all too much. We should not strive to return to the days when the big hospitals were staffed by general practitioners, but should aim at utilizing the best of the old with the best of the new. Young men who hope for a specialist career should be set free from the whole-time bonds which bind them to a rigid time-limited scheme of training in an orderly succession of hospital posts. They should be enabled to do as many of their predecessors did, and, taking such advice as they care, guide their own footsteps and acquire such varied experience as they themselves think necessary or desirable to fit them for successful application for senior posts and for successful and satisfying senior work. They should all be encouraged to gain experience in general practice.

The trainee-assistant scheme should be open to men who at the time of entering do not intend to make general practice their career but who wish to gain this invaluable experience under the guidance and care of good G.P.s. A proportion, at least, of the posts of registrar and senior registrar should be part-time appointments so that the holders would be free to undertake other part-time work in, for example, general practice. If these things were done, and if there were no limit to the number of registrar posts the young men could hold in succession, it would be easier for the registrar who changes his mind and wishes to enter general practice, or who is unsuccessful in applications for senior hospital posts, or who, for that matter, has taken registrar posts to obtain training, experience, and skill as a deliberate step to general practice, to secure an entrance to practice. The stigma of

"stickit specialist" would not adhere to him, and executive councils would not reject him as consistently as they appear to do to-day.

Part-time Appointments

Let us look at the other side of the penny. There should surely be no real or implied bar to the appointment by hospital authorities to junior or senior part-time posts of men who are engaged in general practice, so long as the applicants can show to the satisfaction of the appointments committees that they are suitably qualified and experienced to do the work and are able to give the necessary time from their practice commitments. We may be sure that no one will apply for a part-time hospital post who does not wish it and who cannot give the necessary time, and we may be equally sure that boards will not appoint men whose qualifications and availability do not satisfy them.

It will be appreciated that these two propositions, on registrar posts and on G.P. applications for staff posts, are interdependent. The registrar who is engaged in part-time general practice, or who, after a variety of hospital posts, has entered whole-time general practice, would not be debarred, solely by reason of his engagement in general practice, from applying successfully for a part-time hospital post. Equally, few if any G.P.s would succeed in convincing appointments committees of their qualifications for part-time hospital posts who could not point to recent experience in the appropriate field of hospital work. Such part-time hospital and part-time general practice posts need not be confined to either the junior or senior ranks of the hospital service, but should be open throughout the range, the only criteria being suitability of qualifications and certainty of availability.

It is, of course, unrealistic to imagine that all G.P.s would quickly acquire hospital appointments. Many would not wish them, many could not claim the necessary qualifications, and many with large or even moderate lists could not give the time. Yet it is just as foolish to imagine that because a man is engaged in practice he cannot have acquired the qualifications and interest necessary to maintain his place in a hospital team.

G.P. clinical assistantships in hospital seem to me to offer only a limited usefulness, and that chiefly in the field of postgraduate training. In my view they are not the answer to the problem of the association of the G.P. and the general hospital.

I do not propose to discuss at length the question of remuneration, for I think that, important as it is, it is not fundamental in respect of the matters I have mentioned. Let it suffice for me to say that I believe that the rate for the job should be paid.

Beds for G.P. Use

These preceding thoughts have been in respect of the G.P. on the general hospital staff *qua* staff member. I turn now to the G.P. on the hospital staff *qua* G.P. I think we should accept that, so far as the general wards and units of general hospitals are concerned, there is little likelihood of beds being set aside for G.P. use. Any belief to the contrary seems to me to savour of the Canute-like attitude to which I have referred already. Several considerations bring me to this conclusion. By long tradition the senior physician (or surgeon) of a general hospital unit in Scotland is "the chief," and he carries the overall responsibility for all the patients in his unit. It follows that the remainder of the staff of that unit are, to a greater or less degree, subordinate to him, yet the essential idea of G.P. beds is that the G.P. should be fully responsible for the care of his patients in those beds. If of neighbouring patients one were looked after by the senior physician and the other by his own G.P., it would be impossible to avoid the development of a feeling of two degrees or qualities of medical care, and, however unjust or unfounded this might be, it could only be harmful to all. Nursing and ward-round schedules and the

requirements of student and nurse training would make ward organization nearly impossible if a proportion of the beds were under the charge of a number of G.P.s who, by the nature of their outside work, might well be obliged to visit their hospital patients at all sorts of irregular hours.

On the other hand, there are to my mind many reasons why the G.P. should have beds at his disposal for the care of his own patients. I consider that no measure could be introduced which would do more to improve the climate in which practice is conducted than the provision of G.P. beds. In many country districts there are large or small cottage hospitals staffed by the G.P.s of the neighbourhood, many of whom have expressed themselves to me as at a loss to understand how city practitioners manage to carry on good practice with no hospitals in which they can look after their own sick patients or confine their own parturient women. The American G.P. usually has his local hospital in city or country, and cannot imagine how his British counterpart can do good work lacking such facilities.

Hospital Developments

There is a growing distinction between general practice medicine and hospital medicine, caused partly by increasing specialization and the development of new techniques and partly by social factors such as bad housing, the absence of domestic help, and the increase in the proportion of elderly persons in the population. It is perfectly right to regard the study and selection of patients suffering from valvulotomy, or the treatment of patients suffering from thyrotoxicosis with radio-iodine, to take but two up-to-date examples, as hospital medicine, but, speaking generally, and of course recognizing that there are many exceptions, the treatment of acute pneumonia or congestive heart failure or peptic ulcer, or many cases of sciatica, and a host of other things, have become hospital medicine only because of the social and domestic obstacles in the way of treatment at home. It is not because these are extraordinary conditions or require special skill or special facilities, beyond the range of the patient's family doctor. The G.P. who has a few private patients left is fully capable of looking after such patients in private nursing-homes and is usually prepared to do so; and he could do the same for many of his Service patients if he had beds at his disposal, given the admitted difficulties of looking after them at home.

A most significant result of these hospital developments has been to withdraw from the G.P. many of his patients at the times of greatest clinical interest and to deny him the professional satisfaction of a good therapeutic job done. I hold that nothing has done more than this to promote the much-discussed decline in the status of the G.P. and to turn him into a purveyor of certificates, a finger-post to hospital, and a prescriber for minor ailments.

A more satisfactory distinction would be between "ordinary" medicine—that is, clinical problems which are within the competence of the ordinary, average trained man—and "extraordinary" medicine—that is, matters requiring special skill or special techniques. It is wasteful to use beds in highly organized and elaborately equipped hospitals for the routine care of "ordinary" cases. Indeed, the big general hospitals have become inflated in size partly because they have been gradually obliged to undertake more and more of this work for the various reasons I have suggested. It is often actually detrimental to patients, especially the young, the old, and the nervous, to "hospitalize" them in large and to some extent impersonal and frightening institutions which may be a long way from their homes, and this should not normally be done unless there are overriding medical reasons—for example, the real or suspected existence of some "extraordinary" condition. There must, of course, be room for variation in usage. There can be no objection to the hospital consultant's undertaking the care of a patient with an "ordinary" illness if this is the desire of the patient or his doctor, or if he should be engaged upon a particular research problem.

District Hospitals

I consider, therefore, that there is need not for more and yet more general hospital beds but rather for district or neighbourhood hospitals where the local practitioners could look after their own patients. As I conceive it these should be small and many rather than large and few, so that they would not frighten the timid, would have an atmosphere of belonging to the neighbourhood, and would reproduce so far as possible the atmosphere of district nursing-homes. The services of consultants should be available, as should simple ancillary diagnostic and therapeutic services, and there should be a qualified nursing staff. The district nurse should have her headquarters there. The district hospital should be the district maternity home, where practitioners would deliver their own patients. The maintenance of a good standard of G.P. midwifery surely depends on continuous practice in normal deliveries. The specialist obstetric hospital should be primarily concerned with the abnormal or "extraordinary."

The provision of district hospitals, offering to the urban practitioner, if he should wish to make use of them, the facilities enjoyed by so many rural practitioners, does not seem to me to be a Utopian concept, but an eminently practical one. These hospitals might, of course, be large chromium-plated palaces specially built for the purpose, but they need not be. The utilization and modest modification of existing domestic buildings could provide a perfectly adequate substitute. It is usually stated that a multiplicity of small hospitals is more expensive to maintain than one large hospital, but this is certainly not the whole story. A new large general hospital or a large addition to an existing one must be a new construction, the cost of the building and equipment of which is astronomical at the present time. It is because we usually think of new hospital provision in terms of modern general hospitals, with their complicated equipment, laboratories, and ancillary departments, that we shy at the cost and say it cannot be done in our lifetime. The district hospital on the cottage-hospital model is a much simpler affair which, provided at comparatively modest cost by modification and improvisation, might well reduce drastically the need for the provision of new ultra-expensive general hospitals. Even if over the years the cost were somewhat higher the price would be a small one for the nation to pay if it restored to the G.P. (where he has lost it) the affection and respect of the public and a professional pride in his work.

Conclusion

I do not deny that I have been looking into the future, even the distant future, but I firmly believe that a start must be made soon if the adverse trends of the past and the present are to be halted or modified. I would plead for a reorientation of our thinking on the matter of hospital planning. Too much of our attention has been given to the specialist aspect of hospital development. Regional boards are charged with the duty of hospital planning, but in the nature of things this has meant the planning of specialist services and hospital provisions. No body under the Service, apart from the Government departments, is charged with the duty of planning the general medical service except in respect of the distribution of practitioners. This is a sad omission. We all pay service to the family doctor as the base of the edifice, but I fear it is usually lip-service. Little is done to ensure that the climate in which he works is that which is most conducive to good work—the maintenance of old and the development of new skills.

The new diagnostic and therapeutic techniques of to-day should be the commonplace of to-morrow. Once the sphygmomanometer was owned and used only by the consultant, now it is as much a general professional badge of office as the stethoscope. The anticoagulant treatment of intravascular thrombosis is at present a matter for the

hospital consultant, but there is no reason why it should not come to be understood and applied by the family doctor if reasonable facilities were made available to him. The essential provision, in my view, is the district or neighbourhood hospital. This I consider to be the most powerful way to bring the G.P. back from his backwoods isolation into the general community of advancing medicine, of which his training should entitle him to be a full member.

Medical Memorandum

Acute Inversion of the Uterus Successfully Treated by Intravaginal Hydraulic Pressure

Acute inversion of the uterus is one of the rarest and most serious of obstetrical complications. Only two cases have been recorded at the Sussex Maternity Hospital (receiving an average of 1,500 cases yearly) in the past 25 years, of which this is a record of the second. The former patient died from shock before replacement of the uterus could be attempted. It seems worth while to report the successful treatment of the latter, to emphasize the value of early recognition and the value of modern anti-shock therapy.

CASE REPORT

A 2-para was admitted on February 23, 1950. Her last menstrual period was on May 17, 1949, and the expected date of delivery February 24. The pregnancy was normal; Wassermann reaction negative; blood group O, Rh-positive. Her previous health and confinement had been normal. Regular pains had begun four hours before admission at 5 p.m., when there was no show; the presentation was L.O.P.; and uterine contractions were of fair intensity, one in 10 minutes; and the foetal heart rate was 140. A soap enema was given. At 7.30 p.m. pains became stronger, with a frequency of one in two minutes, and at 10.30 p.m., when she was fully dilated, the presenting membranes were ruptured. Vaginal examination showed persistence of the L.O.P., in the lower third of the pelvis, and at midnight, as there was no rotation or advance, forceps were applied, and with a very easy pull the head was extracted face to pubes. The shoulders and trunk followed easily with no perineal tear, and intravenous ergometrine, 0.5 mg., was given. The uterus appeared to retract well, but on moderate pressure being applied to express the placenta the inverted uterus with placenta attached appeared at the vulva. The placenta and membranes were removed, and the uterus was placed in the vagina, but no attempt at reduction of the inversion was made. Morphine sulphate, $\frac{1}{4}$ gr. (16 mg.), was given, and an intravenous plasma drip started.

On my arrival at 1 a.m. the pulse rate was 140 with reasonable volume and the general condition seemed fairly satisfactory. On abdominal examination the cervix was palpable just above the pubes as a large dimple admitting two fingers. A blood transfusion was substituted for the plasma and the patient anaesthetized with open ether. The completely inverted uterus was found firmly retracted in the vagina.

Reduction by the method of O'Sullivan (1945) was decided on. The introitus being blocked with the left hand, "dettol" solution at 118° F. (47.7° C.) was gently pumped into the vagina by the right, using a freshly boiled Higginson syringe, pumping being continued to replace leakage. From time to time the cervix was examined abdominally for signs of dilatation, and these appeared after about 15 minutes. Continued douching was followed by further dilatation until it was possible to insert the coned hand (*main d'accoucheur*) into the half-dilated cervix, when to-and-fro movement with separated fingers assisted the dilatation. This being complete, the inverted uterus was reduced with the right hand, starting with the part next to the cervix and working to the fundus. When replacement was complete the uterus was grasped abdominally with the left hand and ergometrine,

0.5 mg., was given intravenously, the right hand remaining in the uterus till retraction was established. It was then slowly withdrawn to the vagina, where it encircled the cervix and helped it to contract, to avoid recurrence of inversion. There was very little loss, the pulse rate was 160 and the volume fair, and the condition seemed good. At 5 a.m., when 2 pints (1.1 litres) of blood had been given, the transfusion was discontinued, and at 6 a.m. improvement justified removal to the general ward. At 10 a.m. the pulse rate was 100 of good volume, loss was very small, the uterus well retracted, and the condition good.

Penicillin, 500,000 units, was given three-hourly for the first day and then twice daily till the fourth day, when, after three days of slight pyrexia of 98.8° F. (37.1° C.) and a pulse rate between 100 and 110, the patient had a slight evening rigor, with a temperature of 101.8° F. (38.8° C.) and a pulse rate of 140. No cause was found, a vaginal swab and catheter specimen of urine showing no pathogenic organisms. Penicillin was discontinued and sulphadimidine, 1 g., was given four-hourly. In 24 hours the temperature was normal and the pulse rate 100. No further fever occurred, and in four days chemotherapy was stopped. Involution of the uterus continued normally.

On the thirteenth day a blood count showed Hb 55%; red cells, 3,150,000; C.I., 0.87; white cells, 8,900, with normal differential. A further 2 pints of blood was transfused and the patient was discharged on the nineteenth day in a very satisfactory condition. Post-natal examination on April 17, seven weeks after delivery, showed a well-involuted uterus, mobile and anteverted. The cervix was normal and the perineum in good condition. The menses had not resumed. The patient's general condition was excellent.

The baby was a healthy female, and had regained her birth weight of 8 lb. 12 oz. (4 kg.) on leaving hospital. The feeds were complemented, owing to a poor breast-milk supply.

COMMENT

In retrospect, the management of the third stage should not have been the cause of the inversion. Intravenous ergometrine is in almost daily use and the amount of fundal pressure exerted was very moderate.

Shock disproportionate to the amount of blood lost is the usually prominent and dangerous symptom in this rare and serious complication of childbirth. The shock apparently results from stretching of the nerves in the broad ligament of the inverted uterus. Restoration of the uterus to the normal position as quickly and as gently as possible is the best treatment, since it removes the cause of the shock. The conditions of treatment can, to judge by this case, be fulfilled by replacement of the uterus by intravaginal hydraulic pressure, as suggested by O'Sullivan.

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REFERENCE

O'Sullivan, J. V. (1945). *British Medical Journal*, 2, 282.

This year's Summer School of the Central Council for Health Education was held at Royal Holloway College, Englefield Green, Surrey, from August 10 to 20. The inaugural addresses were given by Alderman W. E. Yorke, chairman of the council, and Dr. John Burton, director of the council. The programme included lectures on "Health at Home," by Dr. John D. Kershaw, medical officer of health for Colchester; "Health at School," by Dr. C. M. Fleming, reader in education for the University of London Institute of Education; "Health at Work," by Dr. Richard Schilling, reader in the Nuffield Department of Occupational Health in the University of Manchester; "Health Education in Hospital," by Miss K. A. Douglas, matron of St. Mary's Hospital; and "Care of the Aged," by Dr. C. A. Boucher, medical officer, Ministry of Health. Seventy students attended the full course from all parts of this country and from many widely different overseas areas.

Reviews

AIMS OF BIOPHYSICS

Progress in Biophysics and Biophysical Chemistry, volume 3. Edited by J. A. V. Butler and J. T. Randall, F.R.S. (Pp. 386. 17 figures. £3 3s.) London: Pergamon Press. 1953.

In this, the third volume to appear since 1951, the problems of ascertaining molecular structure, with special reference to biological systems, are discussed at length. In addition, the book contains articles on the theory of the ionic double-layer and on transport processes through membranes. In looking through this and the previous volumes we have the impression that the editors have scraped the biophysical pot fairly clean, so that we may expect a pause of several years before progress justifies a new volume.

We may therefore profit by this respite to reflect on just what is meant by biophysics. Physiology concerns itself with the analysis of living behaviour. As our knowledge increases, this analysis may be pushed so far that some phenomena, notably the conduction of the nerve impulse, can be expressed in terms of the concepts of the physical chemist. But in other aspects our knowledge of the phenomena is still too limited to permit of a description in terms of such fundamental concepts, and the physiologist has to limit himself to categories that are still remote from precise definition—reflexes, hormone action, and so on. Correspondingly, physiologists have tended to fall into two very loosely defined and frequently overlapping classes—namely, the *general physiologist*, concerned with the fundamental activities of the cell and trying to interpret them in terms of physical theory, and the *mammalian physiologist*, concerned with those phenomena that depend not so obviously on the fundamental characteristics of the living cell as on their integration in patterns.

A glance at the titles of the articles in the three volumes under discussion would suggest that their objects largely belong to the area covered by the general physiologist, so that one might be inclined to accept the term "biophysics" as a substitute for "general physiology." And, indeed, it was in this sense that the title of biophysicist was first adopted in Britain. But on examining the matter contained in the articles we see that the editors take a rather different view. In essence—and with some exceptions—the articles are concerned with the application of physical techniques to living matter or often to matter derived from living organisms. The emphasis seems to be on technique rather than on the elucidation of vital activity, and consequently the reader is left only too often wondering exactly what progress has been made, and just as often the answer is, Very little. Apparently the editors consider any physicist who uses his instruments on matter of biological origin to be a biophysicist, whether he be an electron-microscopist or a radio-engineer assaying radio-isotopes in a hospital. As a result, the volumes are a strange mixture of genuine physiology written by genuine physiologists, genuine physiology written by people with no claim to the title of physiologist, pure chemistry written by not-so-pure chemists, and so on. As such they must occasion disappointment to every reader—whatever his scientific inclination.

The growth of a new branch from the main stem of an existing science is a natural process, often deplored at first but finally welcomed as a healthy sign of progress. Thus biochemistry is an offshoot of physiology; their ends are similar, but the technical and theoretical requirements of the biochemist have become so highly specialized as to warrant the separation. Biophysics, viewed simply as an outgrowth from physiology, with its exponents trained in the discipline of biology as well as in that of a more fundamental science, should be similarly welcomed. If viewed, on the other hand, as an unnatural segregation of physicists and physical chemists from the main body of their own fundamental science for the primary reason that accident

or design has brought them into biological fields of investigation, one's welcome will not be free of misgivings, occasioned by the fear that such an assembly of scientists, divorced from their colleagues in the basic sciences and regarded with suspicion by the biologist, may degenerate into a sterile association reminiscent of the school of biomathematics in the U.S.A.

A science, or branch of science, should be classified in accordance with its aims and certainly not by its techniques. If we define biophysics according to its aims we shall find that it is no more than animal and plant physiology, and we shall discover that progress in biophysics is by no means so impressive as the rapidity with which these volumes have appeared would lead one to believe.

HUGH DAYSON.

TUBERCULOSIS CLASSIFICATION

The Classification of Pulmonary Tuberculosis. By Milosh Sekulich, M.D. (Pp. 322; illustrated. £3 3s.) London: William Heinemann. 1953.

The purpose of classification is to group together objects of study within a defined field in such a way that thought within that field shall be as precise and action as effective as possible. To this end, classes should be clearly defined in terms understandable and unequivocal to all users. Since classes should be mutually exclusive, their defining characteristics should belong ideally to a single general category. Statements about characteristics belonging to any other general category cannot usefully or legitimately be included within the definition, since such characteristics must, once the defining characteristics have been specified, be the subject of empirical study. Too many classifications in medicine fail to satisfy these desiderata; failure to establish definitions in terms of the smallest possible number of defining characteristics leads to the unnecessary importation into them of propositions which are thus imposed upon the reader *a priori*, although they should, in fact, be treated empirically.

Dr. Sekulich, in his ambitious attempt to provide a theoretically comprehensive classification of pulmonary tuberculosis, has not succeeded in avoiding these pitfalls. Throughout the classification, defining characteristics are inextricably confused with propositions the truth of which ought to be established empirically. For instance, all pulmonary tuberculosis is divided into four principal forms—the inflammatory, the caseous, the fibro-caseous, and the fibrous. This would normally be taken to indicate a morbid anatomical basis for the classification, but these four groups are equated without comment, and without production of any evidence to support the equation, with temporal stages in the development of the disease, the inflammatory and caseous groups being stated to belong to the primary, and the fibro-caseous and fibrous groups to the post-primary stages.

Other curious equations are those of primary with acute and of post-primary with chronic forms of pulmonary tuberculosis. For reasons unstated, fibro-caseous forms are said to spread "by the bronchogenic route," while fibrous forms develop "by haematogenous and lymphatic routes." In the foreword a "law" is stated to the effect that "it is regularly observed that the most recent lesions are absorbed or healed first in the process of regression, and the original lesions last." This may or may not be true, but the reader may reasonably expect that some evidence should be produced in favour of such an interesting proposition, rather than that it should be presented to him *ex cathedra*.

A number of terms of vague or confused meaning are used. "Epituberculosis" should surely be relegated to history now that the clinico-radiological pictures associated with it are known to be due to either atelectasis or non-caseating tuberculous pneumonia. "Tuberculoma" is, in current usage, a loose descriptive term for rounded radiographic shadows thought to be tuberculous in origin. This usage, one may suspect, is mainly a cloak for ignorance, since at least three quite distinct morbid anatomi-

cal types of pulmonary tuberculosis may be associated with such shadows. These terms are so lacking in precision that they should have no place in a classification, unless indeed they are newly defined for some specific purpose. The word "phthisis" is used in the text as a synonym for the fibro-caseous forms of pulmonary tuberculosis, although in the list of definitions of standard terms it is stated to mean "that the tuberculous patient shows the signs of emaciation." The word "fibrocavitaria" is said to denote "a fibrous form in which thin-walled cavities are seen in the absence of obvious caseation"; it is assumed, without presentation of supporting evidence, to be haematogenous in origin. The word "sclerocalcaria" is used in the text without clear definition. A quotation from Laennec provides a good comment: "L'art de raisonner consiste surtout dans une langue bien faite; et rien ne nuit plus aux progrès d'une science que détourner sans motifs suffisants les noms de leur acception reçue, ou d'en créer de mauvais."

A classification of pulmonary tuberculosis is required principally for such practical matters as the comparison of results of treatment, and the analysis of the true significance of notification rates. For this reason, it should not entail the acceptance of theoretical considerations which may not be generally agreed, and which, in their application to some practical instances, may actually be incapable of objective demonstration, but should be based as nearly as possible on simple facts of observation. The most widely used methods of classification are based on no more than extent of disease and the presence or absence of bacilli. Although the applicability of these is limited, they have the virtues of creating no confusion and implying no unproved hypotheses. The classification presented in this book does not possess these modest virtues.

J. G. SCADDING.

RECONSTRUCTION SURGERY

Wiederherstellungschirurgie und Traumatologie (Reconstruction Surgery and Traumatology). Volume 1. Edited by M. Lange. (Pp. 262; illustrated 36 Swiss francs.) Basle: S. Karger.

A new volume having the names of Sterling Bunnell, G. Küntscher, Merle d'Aubigné, and A. Steindler among its contributors must command attention. It claims attention, however, as a new venture and as an attempt to overcome the language difficulty by being trilingual, and Switzerland seems the natural place for its publication. But its endeavour to reach more readers goes no further than the addition of a translated résumé to the articles such as has characterized the Scandinavian publications. To be more truly universal in appeal this should be considerably expanded, as it is probable that none but the trilingual will feel that they get full value from the book.

One-third of it is devoted to medullary nailing, and there are some enlightening comments both by its originator and by Vom Saal, of New York, who supports the conservative school favouring open methods of pin insertion. Both are insistent on strong nails and accurate and tight-fitting pins. Nested nails are recommended for the tibia and humerus. This is perhaps the most complete and interesting section of the book. In the second part there is general agreement about the frequency of necrosis of the femoral head after subcapital fracture—namely, 30%—and Böhler emphasizes that arthritic change is inevitable at some stage in almost all cases. There is no agreement on the value of immediate treatment of fresh fractures with a prosthesis. In the third section, on nerve disabilities, Bunnell discusses the transfer of the flexor sublimis in claw-hand, Merle d'Aubigné the tendon transplants in radial nerve paralysis, and C. E. Irwin the treatment of the hand paralysed by poliomyelitis.

It is stated in the preface that critical comment on the articles by the editorial board will be included in the volume. Discretion appears to have erased such remarks from the first issue. The second, it may be hoped, will unite articles on similar subjects by means of comment from a single mind, and spare more space for résumés. Such

a book thus expanded a little might well effectively replace some of the annual volumes which appear on many subjects and are no more than a glorified index.

J. G. BONNIN.

HEALING ARTS

Disease and its Conquest. By G. T. Hollis, M.A.(Oxon.). Foreword by Maurice Davidson, M.A., M.D., B.Ch.(Oxon.), F.R.C.P. (Pp. 163. 9s. 6d.) London: Oxford University Press (Geoffrey Cumberlege). 1953.

The Healing Arts and Their Future. By Kenneth Walker. The Changing World Series. (Pp. 222. 12s. 6d.) London: Frederick Muller. 1953.

The first of these books is written by a layman for laymen. The author, Mr. G. T. Hollis, the editor of Oxford Medical Publications, has selected 40 or so medical conditions and written these descriptions of them. The facts given are unexceptionable and succinctly stated, and any doctor will be grateful that such a book is written with accurate lucidity. Whether there is any demand by the public for a book of this sort the author and his publishers must know. If there is such a public, it is a pity that not more has been done here to make the dish more attractive and informing. To write that the introduction of insulin was one of the greatest advances in medicine is undoubtedly true, but to have told a little of the story of Banting and Best would have illuminated a flat pronouncement. And why write discreetly that insulin is obtained from "other sources" and leave undeclared the diabetics' debt to the stockyards?

Mr. Kenneth Walker has also written a book about medicine for the layman. It is lively, stimulating, and intelligent. If the doctor cannot expect instruction from it, he can at least read it with pleasure and without discomfort. Mr. Walker assesses the present state of medicine, surgery, and psychiatry, and forecasts our future powers. Although himself engaged in a mechanistic craft, he rejects so narrow a conception of man and his ill-health, and, like some other distinguished surgeons, proclaims man in three dimensions. Being on the side of the angels, our author naturally ranges himself with the family doctors; he writes nostalgically of their past, sympathetically of their present, and hopefully of their future. This book well justifies its inclusion in a Changing World Series.

D. V. HUBBLE.

WOMEN IN MEDICINE

Storming the Citadel: The Rise of the Woman Doctor. By E. Moberly Bell. (Pp. 200; illustrated. 18s.) London: Constable and Co. 1953.

In no branch of work have women more fully justified their emancipation than in the profession of medicine, and now, with many thousands of them on the Register, it seems incredible that they should have met with so much and so bitter an opposition to their claims to be permitted to practise medicine. When we read of one very distinguished physician who, as late as 1878, raised his hand to heaven and "testified that he had but one dear daughter and he would rather follow her bier to the grave than allow her to go through such a course of study," we marvel at the limited view and bigoted ideas of even the last generation. Nor were the generality of women any wiser, for when Elizabeth Garrett told her parents she had decided to study medicine her mother "shut herself up in her room and cried for two days."

Yet the citadel of male conservatism in medical education was slowly and surely stormed by the patience and persistency of a few brave women—Elizabeth Blackwell, Elizabeth Garrett, Sophia Jex-Blake, Mary Scharlieb, and a few others. This book gives a very readable account of the struggle and should be read by every woman doctor and (to keep them humble) by all men doctors too.

Let us spare a word of praise, however, for the few medical men of enlightened views who helped the women on their way—Sir James Simpson, Mr. A. T. Norton, and a few others, while regretting that they were so few.

ZACHARY COPE.

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GENERAL PRACTICE TO-DAY AND TO-MORROW

This week's *Journal* is largely devoted to the problems of general practice and the general practitioner—problems related in part to the intrinsic nature of practice in an age of expanding knowledge, in part to the altered scene resulting from the National Health Service. The greater portion of this week's issue is taken up by reports produced under the guidance and initiative of the General Practice Review Committee set up by the Council of the B.M.A. in 1950:

"to review the present position in general practice, its difficulties and its trends, both generally and with reference to the two years' experience of the National Health Service Acts, and to the B.M.A. report on 'General Practice and the Training of the General Practitioner,' and to make recommendations."

The Committee, under its chairman, Dr. C. W. Walker (a general practitioner in Cambridge), decided to cast its net wide and to gather to the greatest extent possible in a limited time the views of general practitioners and the facts of their practice. It did this in two ways. It instructed the secretary of the Committee, Dr. Stephen Hadfield, one of the B.M.A.'s assistant secretaries, to make a field survey of a representative sample of general practitioners, and he spent a year (February, 1951–March, 1952) investigating 188 practices, combining in this work, in the words of the Committee, "the labour of a Hercules with the wisdom of the Serpent." Secondly, the Committee sent a postal inquiry to 17,616 general-practitioner principals in the N.H.S., and received a response from 12,657, or over 70%. On the basis of these and other inquiries the Committee drew up its own report. It should be stressed that the field survey is the work of one individual, and, as the original contribution of Dr. Hadfield, appropriately appears under his name in our opening pages. Though part of the inquiry set on foot by the General Practice Review Committee, it is not a report of the Committee and responsibility for the findings and opinions in it lie with the author of what is an outstanding contribution to the subject. To lend point to a recurrent theme in Dr. Hadfield's article and in the Committee's report we also publish in our opening pages papers by Sir Heneage Ogilvie and by Dr. J. G. M. Hamilton on the theme of the general practitioner and the hospital. The results of the postal

inquiry and the Committee's own and highly important report appear in a specially enlarged *Supplement*. As the Chairman of Council, Dr. E. A. Gregg, points out in a prefatory note in the *Supplement*, the G.P. Review Committee's report is not a report of the Association's Council: it is a report which the Council has ordered to be printed. There is one last proviso. The survey and the inquiry were conducted before the Danckwerts award was made, an award which has gone far to remove the financial grievances of the majority of general practitioners. This should be borne in mind by those reading the Review Committee's report and Dr. Hadfield's article.

The first thing that may strike the reader of these documents is their objectivity, their honesty, and their sincerity of purpose. The warts and the wrinkles are there in the portrait painted. Many commentators will no doubt pick on this or that item or comment in order to bolster up political and other prejudices. In doing so they will bring discredit on themselves and not on general practice. There is much that is good and some things that are bad in general practice to-day, and this can be truthfully said of any profession and of any section of any profession. The triteness of the truism is removed by the painstaking attempt to identify what is good and what is bad and, where possible, to give it some numerical assessment. To say that 55% of general practitioners are happy in their work may sound a little too precise. But it is fair to infer from this that in the pre-Danckwerts days approximately half the general practitioners in England, Scotland, and Wales were more or less content with their lot—a conclusion at variance with the views of the many propagandists at home and abroad who have tried to discredit the National Health Service. In view of the loose criticisms sometimes levelled at general practitioners the following comment of Dr. Hadfield's is to the point: "Over 90% of the practitioners that I saw are undoubtedly interested and careful in the treatment of their patients. They give the necessary advice, supervise rehabilitation, prescribe carefully, and do dressings and emergency treatment. Not for them the mere hurried writing of prescriptions that I witnessed among a few." He found that some 90% of practitioners considered it their job to act as the patient's "guide, philosopher, and friend," as well as giving him clinical care. He found evidence "of a decreasing tendency to unethical conduct, of the improvement of co-operation by formation of local general-practitioner associations or regular (bi-monthly) drawing-room meetings of groups of doctors, and of the formation of rotas." In one industrial town four doctors previously in opposition to each other had joined in partnership to grapple with the problems introduced by the N.H.S. Of those in practice before the introduction of the N.H.S. 90% used to meet a consultant

in domiciliary consultation: at the time of the survey the proportion was 94%. Of the doctors' premises, Dr. Hadfield found 10% to be unsuitable, and this usually in districts where the housing was generally bad: in one instance the doctor had to bolt his waiting-room chairs together to prevent their being taken away. "I found that 91% of practitioners have what one might call the full range of essential equipment." As to the size of lists, 76% of country practitioners do not want more than 2,000 patients: in the towns 27% were in favour of a list of 2,500; 22% preferred up to 3,000; 13% "are quite happy with 4,000." Fifty-eight per cent. of practitioners said they were working harder than they did before the introduction of the N.H.S. in 1948. In an attempt to summarize his impressions in tabular form Dr. Hadfield writes thus: "Tables which show that no less than 92% of the practitioners whose work was witnessed were adequate or better than adequate may come as a surprise after reading some of the paragraphs of this report. The apparent discrepancy is due to the emphasis necessarily placed upon faults and shortcomings because of the critical approach to the survey."

The picture presented by Dr. Hadfield is that of a hard-working body of men and women doing their job conscientiously in the face of many difficulties and frustrations. It is a picture of men and women imbued with a sense of vocation but often prevented from fulfilment in work because of unsatisfactory conditions—some of them trivial and therefore all the more irritating, and some of them fundamental. It is a picture that justifies a restrained optimism for the future of general practice—restrained because, unless remedies are applied soon and continuously, the present good service the public receives from general practitioners will deteriorate in time. Every profession has its quota of unsatisfactory practitioners. That a few should be outstandingly bad is only to be expected. More care in the selection of students to medical schools is the remedy, and the closely reasoned debate on this in the recent Conference on Medical Education held by the World Medical Association showed that medical teachers are acutely aware of this. But unless the whole environment of general practice is as sound as it can be the best of men will fail to give of their best.

Certain conclusions come out of the survey and report. The first is that unsatisfactory relations with other medical and health workers and institutions impeded the work of the general practitioner; and it must not be concluded that in this the general practitioner is free from blame. He is not the only man who is in step. The second is that the N.H.S., by its rigid tripartite structure, has divided the medical profession more sharply than ever before into three separate professions instead of welding them into one. The third is that the rapid advances in medical science during the past three decades have imposed stresses and

strains on all types of practice, and that these have created problems of their own the solution of which is not made easier by the inflexible structure of the National Health Service. By and large the relations between general practitioners and their patients are good. But the recurrent complaint is that all over the country a persistent few harass the doctor with trivial complaints: "The average doctor . . . would be much happier in his practice . . . if only he could purge his list of this hard core of inconsiderate trouble-makers." In its report the Committee, however, asks a pertinent question: "Who shall say, without examining the patient, whether a condition is 'trivial'?" Nevertheless the complaint represents something real—possibly overwork, possibly a feeling of loss of prestige. As the Committee's report states: ". . . the danger of the present attitude is that the patient is coming to regard the general practitioner not as his adviser but as a person to give prescriptions and certificates and to refer to a specialist any illness of more than a minor nature." Again, the report states: "There is little doubt that there has been at least some deterioration in the doctor-patient relationship."

On the whole relationships among general practitioners themselves seem to have improved; there is a greater readiness to co-operate in the solution of common problems. As the survey shows, there is still a sharp divergence of view between the G.P. and the medical officer of health, a divergence the N.H.S. seems to have widened. In the view of the Committee the remedy seems to lie "to some extent with the initiative of medical officers of health, who are appreciating more fully the need for personal contact. . . . At the same time the Committee wishes to call the attention of general practitioners to the need for reciprocal action in this matter." Complaints, too, are made about health visitors, and the Committee is convinced that a review of the functions and activities of this group of public health officers is called for. There is an apparent weakening of the bonds between general practitioner and consultant. The latter, being now less dependent on the former for his living, is thought to be more aloof. The G.P. gets reports from junior hospital officers instead of from senior consultants. Increased specialization makes it difficult to get the opinion of a "general consultant." The G.P. is kept in the dark about his patient's progress, or even death, in hospital. Added to this is the progressive exclusion of the G.P. from hospitals and hospital work. As a root cause of these and many other difficulties the Committee criticizes the structure of the N.H.S. The administrative separation of the consultants under regional hospital boards, of general practitioners under executive councils, and the separation of the public health service constitute "one of the most important causes of the lack of contact between the three main branches of the profession."

Whatever virtues the N.H.S. may have, it has lessened the sense of unity in the medical profession, has made unification of services unbelievably difficult, and has created as many problems as it tried to solve.

Dr. Hadfield's survey, the results of the postal inquiry, and the Committee's report together make up the most valuable inquiry into general practice that has yet been made in this or any other country. The range of inquiry, the attention to detail, the fearlessness of criticism, and the constructive nature of the many proposals for remedy will engage the attention of individual doctors, professional organizations, and Government departments for some time to come. Underlying the whole approach of the G.P. Review Committee is the desire to make general practice in Britain better than it has been before so that it may continue to attract into its ranks men of the highest calibre, to preserve and enhance the standard of medical care given to the people of Britain. And the Committee wisely sees that this will not be possible until the different medical services under the N.H.S. are unified, until the profession is united, and until full co-operation of all health workers is secured. These desiderata are not yet fulfilled. Whatever divergencies of opinion there may be among various doctors or groups of doctors with this or that aspect of the survey and the report, they will be grateful to the Committee and its chairman, Dr. Walker, and to Dr. Hadfield, for the thorough and masterly way they have carried out the remit of the Council of the Association.

THE G.P., THE CONSULTANT, AND THE HOSPITAL

Throughout the Hadfield survey and the Walker report is a growing rumble of dissatisfaction over the relationship of the general practitioner to the hospital and, to a lesser extent, with the consultant or, rather, specialist. Since July, 1948, there has been a fall in the proportion of general practitioners doing hospital work, and a restriction in the type of work done. There is widespread complaint over the delays in getting patients into hospital, and of the failure on the part of hospital workers to notify general practitioners of the fate of their patients. There is grave dissatisfaction over the lack of hospital provision for the aged and chronic sick and over the delay in arranging adequate treatment of the tuberculous. Some of these complaints and difficulties have no relation to the National Health Service, but the exclusion of the general practitioner from hospital life has, and accounts in no small degree for his feelings of isolation and frustration. Some 52% of the practitioners in the Hadfield survey "feel that practice is obstructed by the inadequacy of hospital services"—that is, a quantitative not a qualitative inadequacy. Only some 14% complained of difficulty in securing admission of urgent cases. Practitioners complain that increasing

specialization means that hospital beds are allotted in small batches to an ever-growing number of specialties. This apparently makes it more difficult than formerly to find a bed for a patient needing treatment. This is linked up with the practitioner's concern over the difficulty of obtaining an opinion from a general consultant, now becoming a *rara avis* and being replaced by a horde of narrow specialists, to the detriment, in the view of many, of medicine. Practitioners asking a hospital consultant or specialist for an opinion consider that more often than was the case they now receive the opinion from a junior member of the staff, often from a registrar whose acquaintance with the conditions of general practice they believe to be meagre or, more usually, non-existent. Nevertheless it may be questioned whether, before the war, many registrars had experience of general practice or whether many consultants had had such experience, at least those on the staffs of teaching hospitals. Though there may be some exaggeration of the position it is interesting to note that 23% of general practitioners in the survey thought that all consultants should have some experience in general practice as part of their training.

The net effect of all this is to increase the sense of isolation of the general practitioner, to make him feel in a position of inferiority, and on this account to encourage him to feel that his patient so regards him. Nevertheless practitioners, while complaining in this way, are sending more patients with minor conditions to hospital. As the Committee's report puts it:

"The habitual transfer of minor surgery to the hospitals is neither necessary nor desirable. The training of the doctor has included instruction in this work, and, in the view of the Committee, it is a part of general practice. The constant sending of cases to hospital results not only in the loss of practical experience but also in a belief on the part of the hospital staff, especially the junior staff, that general practitioners are not competent to perform minor operations."

Some practitioners, however, feel that many of these minor conditions are better operated on in the out-patient department of a hospital than in a surgery. The urban practitioner, with a hospital on his doorstep, is by the nature of things less likely to undertake minor surgery than his country colleague. Again, the country doctor is much more insistent than the town doctor that his work would be better if he had access to hospital beds. The Committee's report strongly favours any arrangement which brings the general practitioner into contact with his patient when in hospital: "This is brought out to most advantage where the general practitioner is on the staff of a local hospital." The Committee regretfully notices a tendency among some practitioners "to accept isolation from hospitals and an impersonal relationship with consultants as an unavoidable result of the N.H.S." It points out that it is the policy of the Representative Body that the general practitioner should be con-

stantly and closely associated with the hospital—a policy which those deeply concerned with the future of general practice will probably endorse. The report advocates access to special departments, clinical assistantships, and the provision of hospital beds for the treatment of “general-practitioner conditions.” These recommendations of the Committee receive strong support in the two articles in this issue by Sir Heneage Ogilvie and Dr. J. G. M. Hamilton—both consultants. Dr. Hamilton urges that so long as the general practitioner can spare the time and has suitable experience nothing should bar his part-time appointment to hospital posts; and he urges, too, that there should be far more flexibility in registrar posts, so that the registrar should also be free, for example, for part-time work in general practice. Dr. Hamilton apparently sees a to-and-fro movement between part-time registrar posts and part-time jobs in general practice; this would do much to break down the barrier which now seems to many to exist between general practice and special or consulting practice. While Dr. Hamilton does not think much will come from appointing clinical assistants to hospitals, Sir Heneage draws attention to what he regards as a successful experiment conducted by the Barnet Group Hospital Management Committee: six general practitioners are appointed to clinical assistantships for six months—two in medicine, and one each in surgery, obstetrics and gynaecology, paediatrics, and dermatology. Each clinical assistant attends two sessions a week.

What are perhaps of most interest are the views of these two writers on the provision of general-practitioner beds. They both urge this, but in doing so Sir Heneage vigorously opposes their use for major surgery. “Operating for a hobby,” he writes, “is a peculiar British sport, and its home has been the cottage hospital. Whatever happens, we must be sure that this horror never reappears among us.” Sir Heneage sees “general medicine to-day . . . passing into the hands of the general practitioner,” and in cottage hospitals of about a 30-bed capacity he would have practitioners looking after their own patients and performing their own minor surgery. Neither Sir Heneage nor Dr. Hamilton considers it feasible to set aside for the family doctor beds in general wards or units of general hospitals. Dr. Hamilton makes a valuable distinction between “ordinary medicine” and “extraordinary medicine.” The latter requires special techniques and special skill available only in hospital and applied by specialists. Dr. Hamilton instances mitral valvulotomy and the treatment of thyrotoxicosis with radio-iodine; as examples of “ordinary medicine” he gives the treatment of acute pneumonia or congestive heart failure or peptic ulcer. Many such conditions have become “hospital medicine” because of social and domestic bars to treatment in the home. Dr. Hamilton, exploring this idea, considers that the

present need is *not* for more hospital beds but for more “district” or “neighbourhood” or “cottage” hospitals, simply equipped and developed in existing private dwellings. This proposal not only has the great merit of providing beds for the use of general practitioners; it also suggests an economical way of easing pressure on expensive hospital beds over the next few years, and possibly of avoiding any unnecessary extension of them. The views expressed by the G.P. Review Committee, by Sir Heneage Ogilvie, by Dr. Hamilton, and by the Representative Body of the B.M.A. all point strongly to one greatly needed reform—the widespread provision of beds for general practitioners where they may give continuous care to patients under their charge and in doing so gain the satisfaction and instruction that come from responsible clinical work under good conditions. At present about three-quarters of general practitioners are denied this.

SOME POINTS IN THE POSTAL INQUIRY

The postal inquiry conducted by the General Practice Review Committee was sent to 18,346 general practitioners, and it may be regarded as satisfactory that 12,657, about 70%, responded. These were divided into groups of between 400 and 500, and each such group was asked to answer two out of a long list of questions drawn up. In addition, just on 400 private practitioners were divided into groups of about 20 and similarly asked questions relating to their work: the response was disappointing, as only 56% of these private practitioners replied. Sixty-seven per cent. of the practitioners worked in towns, and 33% in the country; of the total 12,657 some 45% were single-handed practitioners and 55% were in partnership.

On the whole the postal inquiry bears out the findings of the field survey. There are, however, discrepancies between the two, and the results of the postal inquiry convey a more depressing effect. For example, 61% of doctors answering the postal inquiry said that demands from ex-private patients were excessive, and only 26% of doctors in the survey held this view. According to the field survey 35% of practitioners would like to have private as well as N.H.S. patients; in the postal inquiry this figure was 66%. In the survey 43% of practitioners were said not to want private patients, but only 19% expressed this opinion in response to the inquiry. The survey gave a fairly optimistic picture of the standard of diagnostic procedure, but the Committee in its report observes that “against this good result of objective observation must be set the subjective feeling expressed by a large number of doctors in the postal inquiry that they are unable, through lack of time, to examine patients as thoroughly as they would wish.” According to the survey 19% of practitioners were helped considerably by their wives in the administration of their practices; the corresponding figure in the inquiry was 39%. Some 27% of the practitioners questioned in the survey wanted more postgraduate facilities; but 62% answering the inquiry expressed the same wish—a wide discrepancy.

The Committee regards the survey as providing a more objective assessment of the situation, and in some instances the discrepancies may have resulted from the question being put less ambiguously in the survey.

When it comes to expression of opinion discrepancy is to be expected and the reader will probably be safe in splitting the difference in his assessment of such situations. Where the answer can be “yes” or “no” to a plain fact a closer agreement should be, and is, found. For example, in the field survey 89% of general practitioners were found to have no access to hospital beds; in the postal inquiry the figure was 72%. But of the 246 practitioners (postal inquiry) who had no access to general-practitioner beds 76% believed their practices did not suffer as a consequence; the other 24% said the contrary. In the survey 51% of doctors had developed some special interest in medicine; the corresponding figure in the inquiry is 54%, and it is of interest to note the order in which the inquiry puts these interests: midwifery, paediatrics, anaesthetics, and minor surgery. According to the survey 30% of practitioners assert that the scope of practice had not been increased by recent advances in medicine. It is not quite clear what is meant by “scope,” and maybe different interpretations were made of “recent.” In the inquiry 14% of doctors said that advances in medical knowledge “had had no effect on their practice.” It is difficult to understand just what this means: it may mean financial effect, effect on working hours, effect on interest in work, effect on the doctor-patient relationship.

The analysis in the inquiry of the replies to questions on the care of the tuberculous is interesting. Forty-six per cent. of 313 practitioners were dissatisfied with the arrangements for domiciliary care; 44% were satisfied. Criticisms are made that there is a “great delay between notification and the first visit from the health visitor”; that the tuberculosis officer rarely visits the patients; that the practitioner has not met the tuberculosis officer. One practitioner writes: “It is difficult to know whether one is primarily responsible for the care of these cases or whether the local tuberculosis officer is. In some cases directions and prescriptions are left by the tuberculosis officer and in some cases the practitioner is left to his own devices.” On the other hand many practitioners expressed great appreciation of the value of the work of the tuberculosis officer and his department. Delay in getting patients into sanatoria is one of the gravest defects in the national handling of a serious problem. One general practitioner, in response to the inquiry, summed up his difficulties thus: “The patient falls between two stools. Admission to hospital is not usually possible for a long period, during which time the T.O. does nothing and the patient relies on the G.P. for treatment. The G.P.’s treatment must be non-specific, and in many cases deterioration occurs. Since the advent of streptomycin, with co-operation of the T.O. treatment is sometimes started at home in suitable cases, and this has helped but by no means solves the problem.” Apart from the appalling delays in getting tuberculous persons into sanatoria, there is in the replies to the inquiry a general indictment of the official attitude to the problems of this disease. Two more quotations show at least the deep concern felt by general practitioners and

their sense of frustration at not being able to do more for their patients. “Cases of active respiratory tuberculosis are allowed to remain in dark airless basement flats waiting for months for admission to sanatorium.” And again this: “As methods of diagnosis have so vastly outstripped methods of ‘disposal’ of patients, and as the ‘housing’ problem and overcrowding are as bad in X as anywhere in U.K., ‘domiciliary open tuberculosis’ is a menace to all the remaining occupants of the building—often far too many of them.” And so the sad monotonous story is retold in the faint hope that one day this country will decide to make tuberculosis as rare as diphtheria now is.

There is much else of great interest in the report of the postal inquiry. For example, roughly half the practitioners questioned said they had direct access to pathological and radiological departments, and it is astonishing to note that about half said that their practices did not suffer because of the absence of such facilities. This sharp and even split of opinion is difficult to explain. In reply to a question whether the capitation fee “worked fairly for them as a method of payment, excluding from consideration the actual size of the central pool,” 65% answered “Yes” and 34% “No.” Of those asked whether there should be financial recognition of special skills and of length of experience 54% and 65% respectively said “Yes.” Throughout the survey and inquiry there runs the monotonous refrain of “Lack of time”—lack of time for minor surgery, lack of time for special examinations, lack of time for developing special interests, lack of time for hobbies, lack of time for reading medical journals.

MIDWIFERY IN GENERAL PRACTICE

The sections on midwives and on the practice of midwifery in the General Practice Review Committee’s report, the postal inquiry, and the survey will be read with the closest attention by all those interested in this difficult and often controversial matter. According to Dr. Hadfield about one-third of practitioners dislike midwifery; one-third are not attracted to it but consider it a necessary part of practice; and one-third do as much midwifery as they can because they like it. This corresponds fairly closely to the 76% of practitioners in the inquiry who said they were general-practitioner obstetricians. It would seem safe to assume that whatever the facilities about 30% of general practitioners would avoid (and probably do avoid) undertaking any midwifery in the course of their work. Eighteen out of the 308 practitioners questioned considered it to be an essential part of general practice: “It is the keystone of a successful general practice.” On the other side comes this observation: “I have a large general practice and find that midwifery interferes with ordinary work. I dislike undertaking the responsibility without having enough practice in the branch to keep myself up to date.” There can be no doubt that the practice of midwifery brings a deep satisfaction to those who really love the work; some undertake it chiefly to supplement income and acquire the necessary experience in order to do so.

Relationships with midwives seem to have deteriorated since 1948. “Some midwives,” writes Dr. Hadfield,

"appear to resent the general practitioners having anything to do with midwifery"—a complaint echoed in the inquiry. According to the inquiry 63% of practitioners consider there has been no change in relationship since 1948; 11% believe it has deteriorated. One doctor observes that "midwives since the advent of gas-and-air appliances have taken over practically all midwifery, and, even where one is expected by the patient to attend, the nurses confiscate practically all cases." As against this, another doctor reports an excellent relationship with midwives and attributes this to the team-work spirit, to prompt attendance at calls from midwives, and to insistence on being present at birth in all booked cases.

The Committee gave a lot of time to a careful consideration of the place of midwifery in general practice. "It is firmly of the opinion that midwifery is an integral part of general practice and that every possible encouragement should be given to general practitioners to undertake it." The Committee believes that the drift away from midwifery in general practice in recent years is to a large extent the result of the attitude of those responsible for obstetric services. Social and domestic conditions have encouraged confinement in institutions, and mothers are said to feel safer in a hospital where "everything will be at hand in the event of an emergency." But this makes what "should be a natural physiological process supervised by the family doctor" take on "the aspect of a major illness requiring the care of a special department." If because of unsuitable home conditions a confinement has to take place in an institution it should be possible for the woman to be attended there by her own doctor. (In his paper in this issue of the *Journal* Dr. J. G. M. Hamilton sees this being done in the "district" or "neighbourhood" hospitals he advocates for the use of general practitioners.) The Committee deplores the exclusion of the general practitioner from normal midwifery if only for the reason that this "reduces his ability to deal with the abnormal." Expressing its high appreciation of the work done by midwives, the Committee wants to see the gap between them and general practitioners bridged. "The trouble is that, with the depleted number of domiciliary confinements, some midwives still seem to resent the doctor's attendance at the confinement." As a remedy, team-work is advocated. "At an early date in the pregnancy the patient, her family doctor, and the midwife should meet together in the doctor's surgery and decide whether the doctor should attend at the confinement in any event or only if the midwife finds his attendance necessary." The Committee takes a firm stand against those who wish to prevent by administrative restriction general practitioners, or some of them, from undertaking midwifery. Paragraphs 69 to 87 of the Committee's report set forth a well-argued and most sober presentation of a highly important problem.

SOME CHANGES IN GENERAL PRACTICE SINCE 1948

How far has the National Health Service affected practice since 1948? The first thing that comes to notice are the increased attendances in the surgery, coupled with a slight slackening off of visits to the homes of patients. An irritating feature is the growing number

of late evening calls, offset to some extent by few calls during the night—perhaps related to an increase in institutional midwifery. Another effect is a levelling out of demand for the general practitioner's services over the year, resulting in more work during the summer months than formerly. There is a general criticism that patients with trivial complaints are on the increase: "Often the trivial call is a means of obtaining a prescription for something which formerly the patient would have bought from the chemist. The idea that the public are entitled to such medicines from the National Health Service is now deep-rooted." Increased work from this and other causes means that the practitioner finds less time than he used to to give the patient or his relatives a comforting chat. Less minor surgery is practised than formerly, and this may be related to the absence of special fees for this type of work. Some practitioners, however, think that minor surgery is better done in hospital. Some 45% of general practitioners interviewed in the Hadfield survey applaud the fact that the scope of their work has been widened by the N.H.S., even though many of them do not like the Service: but they feel that it makes it possible for them to do more for their patients. On the other hand, 32% of the "survey practitioners" consider there is now a tendency to regard the general practitioner as "a supplier of medicine rather than as a medical adviser." Some 43% of general practitioners say they no longer wish to have private patients, while 35% are anxious to preserve at least some private patients. "Over the whole range of practitioners visited," writes Dr. Hadfield, "I found 37% more satisfied and 42% less satisfied since the introduction of the N.H.S." There were more younger doctors in the former group and more older doctors in the latter. A disturbing observation is that fear of complaints is making general practitioners anxious. An anxious man cannot do his work as well as he could. There appears to be a growing tendency to co-operation and a decrease in unethical conduct.

Only 14% of general practitioners visited in the survey were prepared to make the N.H.S. "the whipping boy" for contemporary discontents and disabilities. Foremost among these is complaint of delay in getting patients into hospital, inadequacy of hospital provision, of delays and shortcomings in the treatment of tuberculosis, of the growing plight of the aged and chronic sick. The Committee points out that there are still young practitioners who cannot find the kind of practice they want, but—"The Committee cannot help feeling that some young men expect to get on rather too early and too quickly." It also stated this elsewhere in the report: "Not so loudly heard are the voices of those practitioners in middle life who wish to change their practices." The Committee relates this difficulty to the abolition of the buying and selling of practices, and considers that the disappearance of this custom has affected the freedom of all practitioners. The middle-aged man "now has to apply for what is virtually a public appointment, in the competition for which he has been found to be at a disadvantage, possibly for the very reason for which he is seeking a change, that he is over 45 years of age."

THE GENERAL PRACTITIONER AND THE PSYCHIATRIST

A STUDY IN CO-OPERATION

BY

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The introduction of the domiciliary visit has in many cases brought about a closer liaison between the general practitioner and the specialist. Visits to the patient's home and to the practitioner's surgery, and close acquaintance with the social structure of the district in which the practice lies, are of particular value when the specialty concerned is psychiatry. Since 1949 a relationship has developed between a group of four partners in a general practice and a psychiatrist which is believed to be mutually beneficial. We shall attempt to describe some of the experiences arising from this association.

Description of the Practice

The practice consists of approximately 14,000 N.H.S. patients. Most of them are from the lower middle class, and they live in a compact highly urbanized area of London, consisting of street after street of rows of houses. Semi-detached houses are uncommon, detached houses even more so, and there is only a sprinkling of flat-dwellers. The district is one of the few in London where large blocks of flats have not been erected since the war. The average house consists of front and back rooms, kitchen-scully, three bedrooms, and bathroom-lavatory. Gardens are not common. An air of respectability pervades the area, and most of the families have lived in the district for many years. The large super-cinema is missing, and instead there is a small old-fashioned picture house. There are few public-houses, and churches are none too evident a feature of the landscape. The whole area, in fact, is a later nineteenth-century residential suburb, with all that this implies. And yet, with all its imperfections, its inhabitants are fond of their district.

Two main surgeries and a branch surgery serve the four partners who run the practice. An efficient full-time secretary is employed, together with a receptionist. All four doctors live in their own houses, away from but within easy reach of the surgeries. The relationship between four temperamentally different doctors is excellent, and the practice appears to the psychiatrist to run smoothly and efficiently. The psychiatrist arrived on the scene in mid-1949 to carry out a domiciliary visit. Since that time all psychiatric cases have been referred to him, as domiciliary cases, as out-patients at the Maudsley Hospital, or as private patients. From this material there emerges a fairly clear picture of the psychiatric problems which beset the general practitioner, and of the help which the psychiatrist can give him and his patients.

Material

Roughly the cases have been divided into three categories—the domiciliary cases, the out-patients, and the in-patients; the last named will, of course, be derived from the first two groups. The private patients form such a

relatively small group as not to merit consideration here. The relevant information is as follows:

	1949	1950	1951
Domiciliary visits	6	22	40
Out-patients	23	23	62
In-patients	2	9	10

As shown, the number of cases in all groups has risen year by year. In 1951 approximately one-fifth of the psychiatrist's total domiciliary practice and one-fifth of his out-patient practice came from this one source. Given a practice of approximately 14,000 patients, the number of referrals (102) in 1951 is certainly not excessive—representing only one patient for every 140 "on the books." Practitioners commonly remark on the large numbers of their patients who, according to their lights, either have "nothing wrong with them" or are "psychiatric cases." And yet the number of cases referred to the psychiatrist by the average practitioner is very much smaller than the number referred by this particular practice. It may be that some doctors patronize several different psychiatric clinics, but this is not usual. The problem seems to be, first, that of selection, and, secondly, the attitude which the general practitioner takes towards psychiatry. Several surveys among medical students have shown that a majority opinion is extremely critical both of psychiatrists and of the claims they put forward. Prominent physicians and neurologists are likewise sceptical or even hostile, and as leaders of the profession must necessarily greatly influence the attitude of the average general practitioner. Much of this criticism is justified, but scarcely the hostility, for it leads to prejudice, and the patient may be an unwitting sufferer as a result. Clearly, a low opinion of psychiatry will deter the practitioner from calling in a psychiatrist.

The selection of cases is in many respects an even more difficult problem. If approximately 60% of a general practitioner's patients present neurotic symptoms, which of them should he refer to the psychiatrist? Or should he refer them to the local chemist for a bottle of medicine? The psychiatrist is also in a difficult position, for it cannot be said that unequivocal indications exist for certain types of therapy. And this is especially so where psychotherapy is concerned. What categories of patients is it worth while for the general practitioner to refer to the psychiatrist? Should the more severe cases have priority over the less severe, or vice versa? The methods of treatment are so time-consuming and arduous that these questions merit serious consideration.

It would be well, then, to consider the types of cases we have dealt with in these three years. They fall largely into four groups: the depressions, the neuroses, marital problems, social problems. Surprisingly enough, schizophrenia and mania, which are particularly associated by the public with mental illness, form only a very small group. Likewise, the psychiatric aspect of medical disorders has on the whole presented little of a problem to the psychiatrist. Although particularly interested in certain aspects of psychosomatic medicine, the psychiatrist has felt that the general practitioner and physician are best suited to care for these cases.

The role of the psychiatrist in the treatment of peptic ulcer, hypertension, ulcerative colitis, asthma, and other disorders in which emotional factors may be of importance has not been clearly determined. Extravagant therapeutic claims in this respect which cannot be substantiated do nothing to improve the relationship of physicians and psychiatrists. Only special research problems in this field have therefore been referred to the psychiatrist. Similarly, the general practitioners have not unduly burdened the consultant with geriatric problems, and particularly with the disposal of old people. So often the psychiatrist is called out when a practitioner cannot get an old person into hospital, or because relatives are pressing him to remove an elderly person—in some cases it must be said because the relatives no longer care to undertake their due responsibilities. If an adequate geriatric service existed the practitioner would find little need for a psychiatric opinion,

for these cases are not often abstruse or difficult problems of diagnosis or treatment. They do not compare with the problems presented by younger patients.

The Depressions

Of the four main types of cases, that of the depressive reactions looms the largest, and here the question of suicide is most often the reason for a consultation. Psychiatrists well know the difficulties of assessing suicidal risk, but it is astonishing how casually many medical men regard a threat of suicide. The casualty officer washes out the stomach of a patient who, let us say, has swallowed 100 aspirin tablets, and then sends the patient home; or the general practitioner dismisses a weeping young woman from his surgery with a bottle of sleeping tablets. These men are not necessarily to be blamed for their lack of psychiatric training. Of course, most patients who threaten suicide do not kill themselves, but every year there are, in fact, about 4,000 suicides in England and Wales. What, then, should the general practitioner decide when confronted with this problem? In this particular practice a psychiatric opinion has been obtained. This procedure has relieved the family doctor of a good deal of anxiety, and has perhaps saved many lives. Only one suicide has taken place in the practice over the three-year period, when it might reasonably have been expected, on statistical grounds, that six suicides would have occurred. It might be said by some doctors that it is over-cautious to refer to a psychiatrist all patients who threaten suicide, and time alone will tell whether this is a correct policy, but even if only one patient's life is saved it surely is a procedure which is worth while.

Apart from those subjects of depression who have suicidal thoughts and impulses, there is a large group of patients in whom the diagnosis is not self-evident. Hypochondriacal symptoms may mask the underlying depression, whilst, at the involuntal period of life in particular, psychiatric symptoms in any form may be the manifestations of a depressive illness. A correct diagnosis will lead to the appropriate treatment, and often to the speedy resolution of the symptoms. The natural tendency of most depressive disorders is to remit, but the process of recovery can be greatly accelerated. It has been the custom in this practice to refer to the psychiatrist all patients who fell into the group of depressive disorders. The following cases illustrate some of the points raised above.

Case 1.—A married woman aged 39 was seen on a domiciliary visit on January 16, 1950. She stated that she was four months' pregnant, and that the baby lay free within the abdomen. In spite of normal periods she believed she was being "torn apart" by the growth of the baby. She had also become depressed and apathetic, and lay in bed all day. She threatened to cut open her abdomen with a knife if the doctor would not "take the baby away." She believed her pregnancy was a punishment for her sins, particularly for her animosity towards her sister. She was admitted to the Maudsley Hospital on January 23. A diagnosis of depressive reaction was made, and she received 10 electric shocks. Complete recovery followed. Two years later a follow-up has shown that she is well, is working, and is symptom-free.

Case 2.—A married woman aged 21 was seen as an out-patient, having been depressed and "weepy" for the past three years, following the birth of her first baby. She complained of aching pains in the head and back, and felt that her body had been damaged during the birth of her baby. She felt that life was not worth living. She was three months pregnant when she married the father of the child, a withdrawn, unsocial Pole twelve years older than herself. Her family history showed that her mother was a hypochondriacal woman who had been unwell since the birth of her last child—her symptoms being almost identical with those of the patient—and that one sister drank heavily and was emotionally unstable. On examination the patient wept throughout the interview and showed evidence of many hypochondriacal ideas. She firmly believed her symptoms were the result of some unknown disease. A diagnosis of a depressive reaction with hypochondriacal features was made, and she was started on supportive treatment as an out-patient. A poor prognosis made it likely that she would need treatment extending over a lengthy period, with observation and a possible future admission to

hospital. Her suicidal threats were not regarded seriously, and, in view of the hypochondriacal features, no attempt at educative psychotherapy was made.

The Neuroses

The second large group of patients comprises those with psychoneurotic disorders. Here again there is much ground for discussion, but it has been felt that the treatment of these patients is largely beyond the capacity of the general practitioner. Although many neurologists regard themselves as qualified to treat neurosis effectively, psychiatrists recognize that special techniques and facilities, and psychiatric training, are necessary. Again the main problem confronting the general practitioner is that of selection. Unlike the depressive illnesses, it is not essential to treat neurosis, and the number of neurotic patients is overwhelming. In a large practice selection must inevitably be made, and an emphasis has been placed on age, intelligence, and severity of symptoms. By no means all of the neurotic patients referred to the psychiatrist have been suitable for treatment, but even in those cases unsuited to intensive treatment an attempt has been made to help the general practitioner with some of his more "difficult" patients. And it is useless to deny that many neurotic patients are a source of exasperation to doctors, and even to psychiatrists.

The chronically dependent patients, living on their monthly bottle and their five minutes with the doctor, may wear out the best of us—and the psychiatrists may give much-needed relief to the general practitioner with this type of case. With the young, intelligent, and comparatively well-integrated neurotic, treatment may be extremely successful; and good results will convince the general practitioner that psychiatry can be of help to his patients. It has therefore been the policy of the psychiatrist to concentrate his efforts on such patients, and to build up an organization mainly devoted to psychiatric therapy. The briefer forms of psychotherapy have been used extensively, in the main aiming at symptomatic relief.

Marital Problems

The third group comprises the marital problems—the patients who consult their doctor, not on account of illness, but because they are finding some difficulty in their marriage. The majority can be dealt with satisfactorily by the general practitioner, but there are cases which can be dealt with only by a psychiatrist. This is not necessarily to say that much can be done to help such patients; indeed, it is most commonly a legal and not a psychiatric opinion indicated. However, when psychiatric symptoms have arisen as a result of marital disharmony it would be unwise to disregard them, and the general practitioner is best served when reinforced by a psychiatric opinion. Many of the irritations to the doctor caused by his becoming involved in legal affairs may then be avoided, for the psychiatrist should be more able to deal with such cases and to avoid legal entanglements.

Social Problems

This group comprises those in whom symptoms are related to social factors—loneliness, isolation, poverty, housing, unemployment. The use of the specially trained team of psychiatrist and psychiatric social worker may be of some value, their knowledge of social institutions providing a therapeutic link which the general practitioner cannot provide. Retraining for industry and the use of convalescent homes, of social clubs, and of the existing social services, can all be indicated in particular cases. The labour involved in steering the patient towards these services is often considerable, and can best be carried out by a psychiatric social worker, so relieving the general practitioner of a great deal of work.

From our experiences it is possible to give some indications as to the type of patient who will most benefit from the use of the psychiatric services. The frank psychotics and mental defectives who are in need of care and protection or are a danger to themselves or others present little difficulty

culty in disposal. However, we believe that it is well worth while to obtain a psychiatric opinion in all these cases, if possible, rather than to send them direct to an observation ward. The depressed patient will also require more special supervision than the family doctor can provide, and will need psychiatric treatment.

It is with the large group of neurotics that most difficulties will arise. On the whole we have devoted our main energies to young intelligent people who show good evidence of dealing with most facets of life on a realistic basis and whose neurotic symptoms are of recent origin. There is a great reservoir of chronic neurosis, as of chronic physical ill-health, and it is unrealistic to believe psychiatry can deal with such cases at present. The physician has usually no illusions about the patient with a "chronic medical disorder," but too many psychiatrists believe that almost every patient who comes to them can be helped. We have had no hesitation in rejecting for treatment cases which we have considered as falling into the category of chronic neurosis. These patients have been advised to regard themselves as partially disabled and to live their life accordingly. Such advice has, of course, come from the psychiatrist. If it came from the general practitioner it would not be welcome. Home truths are seldom appreciated, and a too-frank practitioner is not always successful. The aura of specialism, however, often predisposes the patient to listen favourably to the advice the specialist gives him, and some excellent results have been obtained. The following is an example.

Case 3.—A spinster aged 46 had been a constant frequenter of her doctor's surgery for many years. She had had "pneumonia" as an infant and at the ages of 3, 16, and 42; "measles three times as a child and once at 27"; influenza at 27; appendicectomy and left ovariectomy at 29; arthritis at 20 and 42; tonsillectomy at 30; haematemesis at 32; rubella at 35; chronic nasal discharge, left antrum drained, at 36; pleurisy at 43; otitis media at 45; painful feet since childhood, for which she had had special exercises and boots; and acrocyanosis. This formidable list of complaints was no less formidable than her personality, which was that of a chronically dependent and yet aggressive woman. The psychiatrist was called in when her demands on the doctor were becoming increasingly impossible to meet. She was taken into hospital and a firm line adopted, so that her wheedling childish tricks were exposed to her. In addition a sympathectomy was performed for the acrocyanosis, the result of which was very successful. She was then discharged after several frank and critical interviews with the psychiatrist. On follow-up a year later she was much better, had seldom consulted her doctor, and was working part-time. The general practitioner is delighted; her multiple ailments have vanished for the time being, and if she shows the slightest sign of a return of symptoms she will be referred to the psychiatrist again. The fact that she has not transferred herself to another general practitioner is a hopeful augury for the future.

Comment

Cases of marital disharmony have on the whole proved unsuitable for psychiatric treatment, and the less the psychiatrist or family doctor is involved in cases of "mental cruelty" the better. Many patients primarily needing a legal opinion are referred to a psychiatrist. From our experience there is little to be gained from this. However, there is more to be gained when social factors are of importance in the genesis of the psychiatric symptoms, but a careful selection of cases must be made on a realistic basis. It is little use expecting the psychiatrist to remedy social defects such as poverty or poor housing, for example. In this type of case the responsibility for the choice of treatment lies particularly with the general practitioner.

The results of all this activity are difficult to assess over a three-year period. As spontaneous recovery may occur in 60% of psychiatric patients, it is clear that a good deal of the psychiatrist's work consists in tiding a patient over a current difficulty more speedily than can be done by the non-psychiatrist. In Victorian times maidens swayed or had hysterics, and were treated with sal volatile or a bucket of water, according to their class. Nowadays a psychiatrist is called in, but it has not yet been proved that his

work is often more efficacious than the two remedies cited. However, the changed pattern of medical practice, which recognizes psychiatric disorder as within the province of the doctor, means that the general practitioner is called in to more and more psychiatric patients. He cannot handle a certain number of these, and if he is concerned for his patients he must hand them on to someone who can deal with them. We believe that the close liaison we have developed is a useful one, from the point of view of the patient, the general practitioner, and the psychiatrist.

Correspondence

Post-gastrectomy Syndrome

SIR,—I was much interested to read the article on post-gastrectomy syndrome by Mr. J. Ewart Schofield and Mr. P. St.G. Anderson (*Journal*, September 12, p. 598), and, whilst agreeing that they have made an important contribution to the cure of the persistent afferent loop syndrome following partial gastrectomy for duodenal ulcer, I feel strongly that they fail to lay sufficient emphasis on the type of operation performed in the genesis of this particular syndrome. In particular I find their explanation that "as all our anastomoses were anterior to the colon, we cannot agree with Ogilvie," who suggests anterior colic anastomosis as a possible cause of "dumping," somewhat ingenuous in view of any lack of comparison with the numbers of afferent loop syndromes occurring in retrocolic anastomoses.

The authors confirm the view that afferent loop stasis and reflux play a part in the "dumping syndrome" and regard the weight of the afferent loop as contributory—a view with which I am in agreement—but the point which seems to be missed by the authors is that these factors are bound to be increased in antecolic anastomosis (as opposed to retrocolic) in proportion to the greater length of the afferent loop. As one who was originally taught and brought up on the antecolic anastomosis and who has changed in the last four years to a routine retrocolic anastomosis, I have been impressed by the freedom of the latter operation from afferent loop complications. In the course of some 85 gastrectomies for duodenal ulcer performed over the last two years I have had no case of dumping syndrome severe enough to even contemplate further operative interference. It may be, of course, that complications may yet occur, but at worst I feel that these cases are better than two of the three quoted by Schofield and Anderson, whom, it should be noted, developed their syndrome within eight months of operation. I believe with Ogilvie that the antecolic anastomosis is a potent cause of the "dumping syndrome," and I am of the opinion that less numbers of this distressing complication would be seen if the retrocolic anastomosis were more commonly used.

Finally, may I make a plea for greater accuracy in terminology? The term Polya gastrectomy should be reserved for the retrocolic anastomosis; the antecolic anastomosis should be called the Balfour gastrectomy after the name of its originator.—I am, etc.,

I. LANGDALE GREGORY.

Tunbridge Wells.

REFERENCE
British Medical Journal, 1952, 2, 299.

Dangers of Ethanolamine Oleate Injection Treatment for Varicose Veins

SIR,—Fostered by a first, and as yet only, allergic mishap with monethylolamine oleate, described in your columns some four years ago,¹ my interest in this matter has been reawakened by Mr. A. Lutton and Dr. G. H. Grant's letter (*Journal*, August 29, p. 510). In this litigious age where the published sayings of the not-so-great (a notable company of which I am happy to be a member) are apt to be quoted as evidence against some unfortunate defendant, one hesitates a while before expressing an opinion. Nevertheless, I feel that

there are by now certain rules governing sclerosant therapy which should find a prominent place in all varicose vein clinics.

First, I must reinforce Mr. Lutton and Dr. Grant's plea for withholding injection in asthmatic patients. This connexion has been brought out in almost all published cases, including my own. Secondly, adrenaline must always be to hand. Thirdly, *so must the patient*. (I always insist that cases should remain in the precincts for at least 10 minutes following an injection; after this period the risk of immediate and dangerous sequelae is past.) Fourthly, a test dose of 0.5 ml. should be given. Fifthly, the injection technique employed should encourage maximum obliteration with minimum dosage.

For this last purpose I cannot but commend a technique based upon the phlebographic investigations of Kinnmonth and Robertson.² I have described this in detail elsewhere,³ but briefly it is as follows. The patient stands, to distend the veins, whilst a venous tourniquet is placed upon the thigh. He then lies down flat whilst the needle is inserted into the vein. The tourniquet is loosened and 2 ml. of sclerosant injected, the patient remaining absolutely still both at this time and for five minutes following. During this period the ethanolamine spreads along the vein for at least 6 in. (15 cm.) on either side of the puncture, staying in concentrated contact with the endothelium. As soon as the slightest movement of toe or foot occurs the sclerosant is whisked away into some deep venous pool, there to be diluted to innocuous obscurity.

With this method there is no need to use more than 2 ml. at one visit; although of course, like all sclerosant manoeuvres, it is a waste of medical horse-power in the presence of untreated venous back-flow.—I am, etc.,

London, W.1.

STANLEY RIVLIN.

REFERENCES

- ¹ *British Medical Journal*, 1949, 2, 335.
- ² *Brit. J. Surg.*, 1949, 36, 294.
- ³ *The Treatment of Varicose Veins and their Complications*, 1951. Heinemann, London.

SIR,—With reference to the letter by Mr. A. Lutton and Dr. G. H. Grant (*Journal*, August 29, p. 510) I have never heard or read of the following addition to the technique. Let digital compression be applied to the vein both above and below the puncture, whatever agent be used. Be content to deal with a small length at a time, in which 2 ml. might well suffice. By this simple expedient one gets a maximum local effect and minimal systemic one. Let the pressure be maintained for several minutes.—I am, etc.,

Doncaster.

W. R. WILSON.

SIR,—We are indeed indebted to Mr. A. Lutton and Dr. G. H. Grant (*Journal*, August 29, p. 510) for reporting the death of a patient after an injection of ethanolamine oleate. As the injection of varicose veins is done so frequently, would you permit me to epitomize my experience of this therapy?

First, I find that only two types of veins will benefit by injection. They are the small clusters, aptly described as "trivial," "vanity," or "nylon" veins, which occur in young people. The others are outlying varices remaining after an adequate operation for varicose veins. No patient in whose varicosities there is an impulse on coughing or who gives a positive Trendelenburg test should be injected, for it is dangerous and useless. That varices may be a manifestation of a congenital arteriovenous fistula explains why a sclerosing injection can produce such sudden and serious systemic effects and yet give no result locally. A sluggish blood stream, which we have been taught is the invariable accompaniment of varicose veins, is indeed rarely the case. The circulation of blood in them is unduly brisk. Those who operate on them will testify to this characteristic.

Regarding the dose of a sclerosant, no matter what its nature I think the first trial injection should not exceed 1 ml. If it is tolerated, subsequent injections should never be more than 2 ml. Two to three groups of veins may be injected at a session with 1½–2 ml. in each, but there should be one minute between them—that is, the time needed to recharge the syringe. If a varicose vein fails to respond to an injection, then another sclerosant should be tried. The temptation to use a larger volume or stronger solution should be resisted. If the veins after several

treatments remain patent, then the diagnosis must be reconsidered; a ligation operation is almost certainly necessary.

There are several well proved and effective sclerosants, but I have decided that Riddoch's solution containing phenol 3%, glycerin 30%, in distilled water is the safest and most effective. I abandoned ethanolamine in 1943 because of the intense pain which followed its use and which often incapacitated patients, thereby encouraging a propagating thrombus and spread to the deeper veins. Collapses from sensitivity to it are also well known.

To sum up, therefore, I have found that injections up to 2 ml. in volume totalling two to three per session are effective and safe, and they are made only into trivial varices or those remaining after an efficient ligation and stripping operation. They are given to the sitting or horizontal patient.—I am, etc.,

London, W.1.

HAROLD DODD.

Hop Dermatitis

SIR,—Having picked hops, and having given first aid to hop-pickers, I feel that a likely cause of trouble has been left out of the discussion on dermatitis in hop-pickers by Drs. J. S. Cookson and Ann Lawton (*Journal*, August 15, p. 376) and Dr. F. Ray Bettley (*Journal*, August 29, p. 512). This is the very considerable abrasion of the skin that takes place in the process of removing the hop-cones from their stalks. The stalks are covered with fine spines which roughen the hardest skin. Matters are worse in wet or dewy weather, when the spines are firmer and skin is made soft by the moisture. The hands of most pickers become sore and scratched, and therefore presumably more susceptible to attack by specific sensitizing agents. Those who handle hops in oast-houses and breweries are not subjected to abrasion by the stalks. It is perhaps for this reason that they hardly ever become sensitized to hops.

My experience is confined to Kent, but, to judge from the figures kindly given to me by the Hop-pickers Medical Treatment Board (Kent), dermatitis is as common among hop-pickers there as in Herefordshire, where Drs. Cookson and Lawton made their observations.—I am, etc.,

London, N.W.3.

JOHN L. STRUTHERS.

Farm Accidents

SIR,—Two unusual farm accidents happening in the same week may be of interest. In the first, a young agricultural student was following a very common practice of oral suction to clear a blocked feed pipe in a tractor run on heavy vaporizing paraffin oil. The obstruction cleared suddenly and a gush of oil filled his mouth, came down his nose, and a quantity was unfortunately inhaled into the lungs. He momentarily lost consciousness, and, coming to, he described seeing objects clearly but at a great distance, as through the wrong end of a telescope. There was intense pain in the chest. A certificated first-aid worker treated him for shock, and gave a salt-and-water emetic which cleared the stomach. When seen, he was very restless, temperature 100° F. (37.8° C.), pulse 80, breathing rapidly, and complaining of severe pain all over the chest. During the night he deteriorated rapidly, temperature rising to 102° F. (38.9° C.), pulse rate rising, the expression anxious, and obviously developing an inhalation pneumonia. He was removed to hospital, where he was on the danger list for a week. A month later he is still in hospital, but making good progress. This case illustrates the dangers of oral suction so commonly practised by motorists.

The second case was that of a young girl who was in the habit of taking cod-liver oil capsules. The box was kept on a shelf in the farm kitchen. At 6 p.m. she took two capsules, and she remembered afterwards that they seemed larger than usual. About 11 p.m. she was violently sick, and complained of intense nausea and weakness. This was thought to be an ordinary gastric upset. Sickness continued all night, and it was only next day that another member of the family, becoming suspicious, looked on the shelf and

found a box of carbon tetrachloride capsules for sheep fluke near the cod-liver oil capsules, and it then dawned on them what had happened. The capsules each contained 1 ml. of carbon tetrachloride. When seen, sickness had stopped, but the intense nausea persisted. Pulse was 50, and the patient complained of feeling very weak. She was given mag. sulph. and heavy doses of calcium chloride, and all fats were forbidden. There was no jaundice or albuminuria. Nausea persisted in a lessening degree for over a week, but it was a fortnight before the pulse rate came up to normal. She has since remained well.—I am, etc.,

Aros, Isle of Mull.

FLORA MACDONALD.

Visual Aids to Education

SIR,—I was surprised that medical art was not considered at the meeting dealing with visual aids held during the First World Conference on Medical Education.

The quality of the diagrams accompanying the films showed clearly the need for artistic supervision. Also the special province of the artist in research work, reconstruction, and interpretation was ignored. The camera cannot think, the artist must; science as well as art goes to the making of a medical drawing. Because the artist is always seeking to show essentials clearly, and to elucidate difficult and obscure points, he is especially useful to students.

If an international committee on visual aids is formed, it is to be hoped that medical art will be represented by first-class artists, for without their help a large and most important field will be neglected, and without their trained artistic sense visual aids will lack much of the good taste and dignity which the medical profession merits.—I am, etc.,

Manchester.

DOROTHY DAVISON,
Medical Artist to Manchester University.

Control of Tachycardia by Quinine

SIR,—Seeing Dr. H. L. Maclure's interesting letter (*Journal*, August 29, p. 511) on the subject of paroxysmal tachycardia reminds me of a personal experience. About a year ago, at the age of 43, I began to have mild attacks of tachycardia. I suspected that they were caused by coffee, but continued to indulge in this beverage, as the attacks were trivial. One night, however, I was awakened by an attack which was decidedly unpleasant, so I decided to stop drinking both tea and coffee. The result was within a few days entirely satisfactory. The trouble disappeared. While on holiday this year, however, I decided to try the effect of drinking coffee again. Within a week I experienced a mild attack of tachycardia.

In the light of this experience I cannot help wondering if the improvement in Dr. Maclure's patient was due more to the omission of proguanil than to his taking of quinine.—I am, etc.,

Winfrith, Dorset.

P. R. BOUCHER.

Paroxysmal Myoglobinuria

SIR,—I was extremely interested in Dr. S. D. Elek and Mr. H. F. Anderson's article on paroxysmal myoglobinuria (*Journal*, September 5, p. 533). My own experience of this condition has been confined to the equine variety, but one or two observations I have made as to the aetiology of the condition may be of interest.

My "patients" were two thoroughbred racehorses, mother and daughter, which bears out the influence of heredity. The sire of the foal did not, so far as I could ascertain, suffer from the disease. The attacks which these animals suffered were completely typical. They were characterized by a sudden onset of swelling and marked stiffness of the muscles of hindquarters and back, with the excretion of very deep red, almost black, urine with a heavy deposit of phosphate crystals. Unfortunately no detailed analysis of the urine was carried out. This condition lasted 24–48 hours and was followed by wasting of the muscles involved and gradual disappearance of the stiffness. The wasting recovered rapidly and all was apparently normal after a week or ten days, even in the severest attacks.

The precipitating factor in all attacks in both animals, which incidentally were in strict training for racing, was fast exercise following a period of two to three days' rest with no reduction in the heavy carbohydrate feeding which racehorses usually get. The usual explanation for these attacks given by the veterinary surgeon was excessive formation of lactic acid in the muscles, which had become "overstocked" with glycogen during the rest period before the attacks. This rest period, which was usually due to some minor leg injury, is of great importance, apparently, because without it no attacks occurred. With regular work and exercise neither animal suffered any ill effects from the severest exertion. Both have won races without showing signs of the condition. Similarly, the heavy feeding is an important factor, as I have found that the attacks can be prevented by a severe reduction in the feeding of these animals during any enforced rest period.

A third member of this equine family, a yearling colt, will be going into training at the end of this year. It will be very interesting to see if he also inherits the disease.—I am, etc.,

Belfast.

D. H. CAMPBELL.

Endocarditis and Dental Extraction

SIR,—Mr. F. R. Coffin (*Journal*, September 5, p. 571) cannot understand why his medical friends do not insist on heavy doses of penicillin for several days before dental extraction in rheumatic subjects. He will find an answer in a paper by Professor R. V. Christie, Dr. J. E. Cates, and myself in this *Journal* (March 31, 1951, p. 653), giving the history of a patient in whom the effects of such treatment were disastrous. This man had been successfully treated with penicillin for subacute bacterial endocarditis five years previously, and, to protect him against recurrence, 2,000,000 units of penicillin was given daily for two and four days before as well as several days after two multiple dental extractions. He forthwith developed a bacterial endocarditis due to a *Str. viridans* requiring 4 units/ml. to inhibit its growth, whereas that causing his original attack had been normally sensitive.

Penicillin given in doses of more than 500,000 units daily is excreted in the saliva and eliminates sensitive organisms from the mouth, but their place is taken by resistant ones previously present in only small numbers, including coliform bacilli, *Candida albicans*, and any sufficiently resistant streptococci. As with other forms of penicillin prophylaxis continued for several days, the penalty for failure is thus an infection much more difficult to treat than any which is likely to have occurred had prophylaxis not been attempted at all. The object in connexion with dental extraction is not to sterilize the mouth but only to destroy such bacteria as enter the circulation. If procaine penicillin is used, the first dose may be given two hours before the operation; for sodium penicillin a more appropriate interval is five minutes. So far from this being an example of locking the stable door after the horse has bolted, what Mr. Coffin would have us do may be likened to opening the lion's cage instead of the jackal's.—I am, etc.,

London, E.C.1.

LAWRENCE P. GARROD.

A Doctors' Orchestra

SIR,—In various countries the music-loving members of the profession have formed orchestras, and it is intended to follow their example in London. Apart from the social and musical experience for those members of the profession who play orchestral instruments, such an orchestra may acquire high proficiency, be most useful for social functions of the profession and for charitable events, and in this way fulfil an important task. Would those medical and dental students, doctors, dentists, and members of their families who are interested in this venture and who play orchestral instruments or otherwise wish to help please write to the undersigned, giving particulars of their experience?—I am, etc.,

14, Upper Wimpole Street,
London, W.1.

H. UCKO.

Obituary

A. RENDLE SHORT, M.D., F.R.C.S.

Professor A. Rendle Short, emeritus professor of surgery in the University of Bristol, died suddenly at Hereford on September 14 at the age of 73.

Arthur Rendle Short was born at Bristol on January 6, 1880, the son of Mr. E. Rendle Short, a director of J. S. Fry and Sons Ltd. From University College, Bristol, he went on to University College, London, and first graduated in 1899 by taking the London B.Sc., with first-class honours in geology. Even as a boy he had



[Barratt's Photo Press, Ltd., London.]

thought of becoming a surgeon, and when he turned to the study of medicine he had an extraordinarily successful career as a medical student. He gained first-class honours in anatomy and won gold medals and exhibitions in physiology and materia medica. He passed the final M.B., B.S. examinations in 1903 with flying colours, winning a scholarship and a gold medal in medicine and obtaining first-class honours in obstetrics. A year later he

proceeded to the M.D., winning still another gold medal. After holding house appointments at the Bristol Royal Infirmary, including the post of senior resident officer, he obtained the diploma of F.R.C.S. in 1908 and became surgical registrar at the Infirmary and lecturer in physiology in the Bristol Medical School. Five years later he was appointed assistant surgeon at the Infirmary and soon afterwards became full surgeon. He was also surgeon to Clifton College for 28 years. A Hunterian professor of the Royal College of Surgeons of England in 1914, he was also an examiner for the Primary F.R.C.S. for a time. One of his many outside interests was the Association of Surgeons of Great Britain and Ireland, and he was a member of its council.

In 1933 Rendle Short was appointed professor of surgery in the University of Bristol, and he occupied the chair until 1946, when he retired and was appointed emeritus professor. A brilliant teacher, his dry humour and his tolerance and understanding of young people made him extremely popular with the students, and his ability to remain young in spirit lightened his task and theirs. A frequent contributor to the medical journals, Rendle Short was also the author of *The Causation of Appendicitis* and *The New Physiology in General and Surgical Practice*, a book which has reached its fifth edition. He was the editor of *Index of Prognosis* and co-editor of *The Medical Annual*.

Of strong religious convictions, Rendle Short belonged to the Plymouth Brethren, as did his father before him, and he founded the Inter-varsity Fellowship, a world-wide evangelical organization for undergraduates, and in this connexion, as well as as a surgeon, he paid many visits to the Continent. He was also a familiar figure in the pulpit, and his services as a preacher were in great demand. He never lost his early interest in geology and

seldom went for a country walk without a hammer in his pocket. Bird-watching, too, was a favourite pastime, and in the garden of his cottage in Cornwall he would spend many hours watching the flight of birds and listening to their calls, until in time he came to know the note of every bird. He married Miss Helen Case, and she survives him, together with his son, who is a doctor, and two daughters, one of whom is a doctor and the other a nurse.

We are indebted to Mr. A. WILFRID ADAMS for the following appreciation: It is a rude shock for our profession, especially felt by older members, when a figure so distinguished and long renowned as Professor A. Rendle Short suddenly falls. His surgical skill, backed by brilliance as a teacher and writer, had given him a national and indeed world reputation. He was gifted with an innate facility for absorbing knowledge, and from his youth up subjects of enduring import were his interest, as witness student days packed with gold medals not only in medical subjects but also in geology, at which he kept on "hammering" throughout life. One so talented and sure of his goal naturally achieved his boyish ambition, rose to the top of the tree in surgery, and very early in his career received the academic distinction of a Hunterian professorship in the Royal College of Surgeons. *Pari passu* with the acquisition of surgical experience, his professional lustre was soon enhanced by his bent for teaching and writing. He had a gift for the exposition of amassed facts in orderly array. Moreover, he had a flair for interspersing with his teaching mnemonics and anecdotes—prefaced with his "I well remember . . ."—whether at the bedside or while he swung the ruler to and fro coaching us students around his gas-fire. He was one of the pre-eminent surgeon-pedagogues of his day, a worthy representative of that class of general surgeon for which former generations were so famous, and crowds followed him. A sidelight on his kindly nature is afforded by the fact that Rendle's "firm" always fared well, despite wartime shortages, for the professor of surgery himself would buy and bring in the buns that brightened tea-time on operating days. A self-reliant man of strong convictions and simple tastes, he disliked ceremony of all kinds. He was a familiar sight on his bicycle long after the age when most of us cease such youthful pursuits. Coming to us from University College Hospital, London, he joined the Bristol Royal Infirmary in 1906 and soon became a much-wanted general surgeon in a practice ranging widely over the adjacent counties. He rose later to be senior surgeon, and inevitably followed Hey Groves in the chair of surgery. Since his retirement in 1946 he has been emeritus professor of surgery. His influence was of inestimable value to the sure foundation of a medical faculty in the early days of Bristol's university.

Medical publishers quickly realized Rendle Short's potentialities as an author. Messrs. John Wright & Sons selected him as a regular contributor to *The Medical Annual* in 1915 and as surgical co-editor in 1919, posts which he retained until his death. His output of new books included a monumental work, *The Index of Prognosis and Results of Treatment*, and textbooks on physiology and surgical subjects which went into many editions. A wealth of scientific knowledge was indicated by his presidential address to the Bristol Medico-Chirurgical Society in 1935, an address containing a spirited challenge against the orthodox views of the day on man's evolution. His able dialectic revealed extraordinary erudition in the fields of geology and zoology. The amazing compass of his brain was coupled with an unfaltering religious faith, and he has left with us the reflections of his lifetime in his latest book, *Wonderfully Made* (1951). He was an ardent advocate of public education on cancer, and was medical adviser to the South-Western Regional Cancer Bureau. Firmly convinced that the name "cancer" savoured to the public of incurability, he pressed that an alternative should be adopted.

There was the other side to his make-up. Rendle Short rose to the full stature of man: not only did the scientist

perceive the pattern of nature, but the seer early sensed divine direction behind the cosmos. In the realm of religion he had the whole situation clarified, definite, and—as some might see it—dogmatic. Inspired by this clear vision, he spent his life in the service of the Master he feared and loved seven days of the week. He wrote books on religious subjects and gave addresses all over the country. With his passing the student world is deprived of a powerful light which has for nearly two generations directed their thoughts upward. The Inter-varsity Fellowship is an enduring memorial to this side of his work.

We shall miss his strong personality. His service to the patients—and quite a host of beneficiaries were his professional colleagues—was vast and rendered with quiet method. My last glimpse of him this summer affords a tender and revealing farewell. He was quite absorbed—a manifest glow of gratification on his face—studying the display of plants at the local nurseryman's. Rendle not only mastered the science of natural history but revelled in the beauty of nature. His departure from our midst comes like a chilling shadow across life, and we offer our deep sympathy to his widow, latterly delicate and the object of his untiring devotion, and to his three children.

Mr. WILLIAM M. CAPPER writes: I should be grateful to be allowed to add a tribute to my old friend and chief, Professor Rendle Short. We who knew him more intimately in Bristol were always impressed by those high spiritual and moral qualities which some of us feel we so much lack. Rendle Short was essentially of a shy and retiring disposition, and a mere acquaintance sometimes left the impression of awkwardness, self-assurance, and even abruptness. But to those who really knew him this pose of self-defence was found to hide the most generous of hearts. We now know that very many people in all walks of life could recount stories of his generosity and timely practical help which virtually saved them, whether it was students who had fallen on evil days, young practitioners struggling with a financial burden, Christian missionaries overseas or crippled with illness at home, or the poor of numberless types. The missionaries and many Christian workers were never allowed to suspect the extent of the medical and nursing-home fees stealthily paid by this great Christian. He excelled as a diagnostician and a teacher of the basic facts of surgery. Perhaps it was his simplicity that gave him his greatness. I have heard few who could so pin down those he was teaching to the heart of the matter in order to get their principles correct. Former members of the Bristol medical school all over the world will continue to hear ringing in their ears some of the basic aphorisms of "The Rendle," as he was affectionately called. If heeded, they will keep them out of a lot of mischief. On behalf of many doctors in this country and overseas we must pay a deeply respectful tribute to his Christian influence upon us. No one of our seniors has more consistently impressed upon us the value of the Bible. No one has done more to show us how unnecessary it is to let the Bible lose its influence on our lives simply because of our supposed scientific outlook; and no one has more humbly and effectively impressed upon us the value of our Lord's atoning sacrifice. It is not too much to say that hundreds of medical students and qualified men through his wise words, clear writings, and consistent example have been prevented from allowing the anchor of their faith to drag amidst the storms of the last fifty years.

V. H. ELLIS, B.Chir., F.R.C.S.

Mr. V. H. Ellis died suddenly on September 15 at the early age of 52. He had collapsed from a cardiac attack after completing his usual morning's work in the fracture clinic at St. Mary's Hospital. His death has robbed orthopaedic surgeons of one of their wisest counsellors. Not only was he among the foremost orthopaedic surgeons of the day; he was also a scholar with an unusually broad knowledge and with interests that ranged

widely from finance to horticulture. His life was devoted to helping others, among whom his patients received first consideration.

Valentine Herbert Ellis was born in India on February 24, 1901, the son of Major-General P. M. Ellis, A.M.S. He was educated at Wellington College and Clare College, Cambridge. Thence he went to St. George's Hospital, qualifying M.R.C.S., L.R.C.P. in 1925. He became F.R.C.S. in 1928 and took the Cambridge B.Chir. three years later. After filling a number of junior appointments at his own hospital and elsewhere he decided on a career in orthopaedic surgery and went as surgical registrar to the Royal National Orthopaedic Hospital. There he came under the stimulating influence of some of the most prominent orthopaedic men of the time—Elmslie, Laming Evans, Bankart, Trethowan.

Appointed to the staff of St. Mary's Hospital in 1932, when he was only 30 years old, he was the first to hold the post of orthopaedic surgeon there. With tireless energy he set out to establish what has now become a leading orthopaedic and fracture department. He was soon appointed also to the staff of the Royal National Orthopaedic Hospital, and later he held additional appointments at Paddington Green Children's Hospital, the Lord Mayor Treloar Orthopaedic Hospital at Alton, and the Heatherwood Orthopaedic Hospital at Ascot. During the second world war he was in charge of the orthopaedic unit at the E.M.S. Hospital at Park Prewett, where many thousands of casualties flown direct from the battle fronts in Europe passed through his hands. Despite the number of hospitals that he served, such were his energy and capacity for work that he was able to do full justice to each of his responsibilities. Indeed, it is doubtful whether any man could have been more punctilious in his regular attendance or more conscientious.

In addition to these activities he found time also to make a considerable contribution, by his writings, to the advancement of orthopaedic surgery. He was joint author, with Mr. B. H. Burns, of *Recent Advances in Orthopaedic Surgery*, published in 1937, and he was a contributor to other authoritative books including Platt's *Modern Trends in Orthopaedics*, Handfield-Jones and Porritt's *Essentials of Modern Surgery*, and Fleming's *Penicillin*. He had a special interest in the shoulder-joint, and had undertaken research into the value and indications of arthrography in the diagnosis of shoulder lesions. Earlier he had made a study of injuries of the cervical spine, from which he concluded that internal fixation by bone grafts was advisable in unstable fracture-dislocations. A gifted teacher with clear ideas based on his own experience, he was nevertheless tolerant of the views of others, and he was seldom happier than when he was engaged in friendly discussion with his colleagues on some difficult problem.

Valentine Ellis will be remembered for his work on injuries of the neck and on disorders of the shoulder. But he will be remembered mainly, by those who knew him, for his sound common sense, his wise judgment, his kindly humanity, and his loyalty—qualities that commanded respect from all and endeared him to his colleagues and pupils.

He married, in 1937, Angela Peart Robinson, and his family life formed a happy background to his work. He leaves a widow with a son and a daughter.—J. C. A.

R. W. J. writes: After a preliminary warning some months ago we have lost Valentine Herbert Ellis, whom most of us knew as Gustav and some few as Val. He was not

always easy to know, but the more you did know of him the more you wanted to know him. It is to my own great regret that I did not know still more of this great individualist, this deep thinker, this man who behind the scenes exerted such influence on the British editorial board of the *Journal of Bone and Joint Surgery* and on the British Orthopaedic Association, of which he was quite certainly destined to be president within a few years.

He was a critic. He was always thoughtful. He had wide knowledge. His merits were best shown at quiet after-dinner meetings such as those of the W. Little Club, when the few select members presented their problems. He was always the dutiful secretary and recorder; his comments were earnest and faithful; and beneath the crust he was a very great friend indeed. We offer our deep sympathies to his wife Angela, and to his young son and daughter, Richard and Mary.

Universities and Colleges

NATIONAL UNIVERSITY OF IRELAND

The following medical degrees and diplomas were conferred at University College, Dublin, on July 11:

M.D.—V. Doyle, *J. Murphy, R. Towers.
M.Ch.—M. Ashe, B. Campbell, *C. Galvin.
M.B., B.Ch., B.A.O.—G. Crean, T. Poon King, M. Mulcahy, B. Achong, G. Gearty, M. Ali Shaw, M. Awon, Margaret Boylan, M. Browne, T. Casey, *F. Christian, A. Clery, P. Collins, J. Comerford, Marie Couacaud, R. Cullen, P. Curtis, P. Fitzpatrick, *J. Fleming, P. Fleming, Mary Frost, J. George, Khorsheed Ginwala, J. Goggin, W. Grant, J. Hassett, J. Hourihane, Elizabeth Hurley, W. Kanachowski, J. Kelly, Mary Kennedy, Mary Kent, F. Kirk, G. Lau, J. Leahy, P. Leddy, B. McCarthy, G. MacDonagh, Maev McGrath, E. Mackey, M. McNulty, J. Masterson, P. Moylan, J. Mozolowski, P. Mulligan, G. Murphy, M. Murphy, B. O'Duffy, T. O'Dwyer, M. Ongley, F. Roche Kelly, *B. Rooney, M. Shipsey, T. Staunton, E. Tempary, W. Verling, Ah-Yen Wong Shiu Leung, R. Znamirowski.

DIPLOMA IN PUBLIC HEALTH.—T. Simpson, *Hanora Forde, *Irene Finnegan, L. Delany, Mary Murphy, *Madeline Moran, J. Walsh, B. McCartie, W. Bushe, P. Carr, P. Daly, E. Desmond, Carmel Dooley, *Margaret Farrell, J. Heagney, A. Loftus, E. McArdle, *D. McCarthy, Ita MacMahon, *D. McNamara, S. Maurer, *P. Prestage, M. Reilly, Eva Roith, Mary Rynne, *P. Sweeney.

DIPLOMA IN CHILD HEALTH.—*D. Cantwell, J. Carroll, J. Cooney, Ellen Courtney, T. Gilroy, *K. Hickey, E. Killian, *M. O'Dwyer.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—*P. O'Connor.
*In absentia.

QUEEN'S UNIVERSITY, BELFAST

The following candidates have been approved at the examinations indicated:

M.D.—A. S. Clenaghan, Mary P. Cole.
M.B., B.Ch., B.A.O.—I. D. A. Johnston (with second-class honours), J. Alexander, F. E. Anderson, E. MacL. Ashenurst, J. A. C. Ball, J. B. Bridges, Beryl M. Bromham, D. Burrows, N. M'L. Campbell, G. C. R. Carey, Enid G. Carson, W. M. D. Clements, Florence M. Cousley, S. J. Cox, D. W. Davison, W. Essigman, Diana H. B. Gillies, A. G. Gordon, W. J. Gray, J. MacDougall, G. Harley, Claire D. Johnston, E. P. Jones, J. H. Jones, J. M. Kearney, Agnes M. T. Kelly, C. P. Kennedy, W. S. Kerr, W. C. Logan, R. J. Loughridge, A. D. M'Farland, J. J. E. M'Gartland, R. A. M'Keown, H. M'Laughlin, C. B. M'Shane, E. A. M'Williams, J. I. Maxwell, Renate M. Meyer, Shelagh M. Milligan, S. R. W. Moore, W. J. D. Murphy, Dallas M. J. Nixon, B. C. Onyeabo, T. A. Piggot, J. R. Purser, W. W. Ramsay, I. C. Roddie, A. C. Scott, E. G. N. Sinanan, G. D. L. Smyth, H. G. Smyth, M. M. Sundie, H. W. K. Thompson, P. M. Walsh, N. L. Wright.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been granted the diploma of L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.S.Glasg.: R. B. Baluch, Cora Branker, Margaret P. Bruce, M. G. Cameron, C. Harris, Maureen E. Hillery, C. R. Johnson, I. Khosla, Eleanor M. Kneale, S. Lal, I. G. Macpherson, J. G. Noble, J. S. Walia, Mary H. Wallace.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending September 5 (No. 35) and corresponding week 1952.

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

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

CASES In Countries and London	1953					1952				
	Eng & Wales	Lon.	Scot.	N. Ire.	Eire	Eng & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	20	3	6	0		22	2	3	0	
Dysentery ..	205	43	94	8	10	90	17	94	6	3
Encephalitis, acute ..	5	1	1	0		8	1	0	0	
Enteric fever: Typhoid ..	9	0	1	2	0	4	0	0	0	1
Paratyphoid ..	11	13 (B)	1	1 (B)	0	44	12 (B)	0	12 (B)	0
Food-poisoning ..	256	24		1		139	20			0
Infective enteritis or diarrhoea under 2 years ..				19	59				19	66
Measles* ..	802	27	30	21	30	3,649	412	42	56	108
Meningococcal infection ..	26	2	6	0	3	28	2	7	1	
Ophthalmia neonatorum ..	27	1	4	0		28	6	11	0	
Pneumonia† ..	183	12	119	6	1	220	9	135	6	2
Poliomyelitis, acute: Paralytic ..	123	9				150	15		19	1
Non-paralytic ..	101	7	26	10	16	65	12			
Puerperal fever § ..	246	38	11	0		216	31	9	0	
Scarlet fever ..	483	26	123	13	26	557	49	151	14	46
Tuberculosis: Respiratory ..			131	22				151	19	
Non-respiratory ..			19	6				34	4	
Whooping-cough ..	4,058	354	516	28	65	1,861	83	107	41	105

DEATHS In Great Towns	1953					1952				
	Eng & Wales	Lon.	Scot.	N. Ire.	Eire	Eng & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	1	1		0		0	0		0	
Encephalitis, acute ..		0			0		1			0
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	6	2	0	0	0	7	0	1	0	
Influenza ..	0	0	0	0	1	1	1		0	
Measles ..	0	0	0	0		0	0		0	
Meningococcal infection ..		0	0				1			
Pneumonia ..	115	14	17	10	3	129	21		5	3
Poliomyelitis, acute ..	8	0	1		0	9	0			0
Scarlet fever ..		0	1	0	0		0			0
Tuberculosis: Respiratory ..	84	14	8	1	3	87	6	11	2	2
Non-respiratory ..		1	1	0	1		4	3	0	0
Whooping-cough ..	2	0	0	0	0	1	0		0	0
Deaths 0-1 year ..	162	31	22	4	9	216	22	26	8	17
Deaths (excluding stillbirths) ..	4,146	595	490	99	107	4,268	620	475	90	118
LIVE BIRTHS ..	7,289	1081	786	200	385	7,348	1141	757	208	352
STILLBIRTHS ..	185	25	30			165	21	22		

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

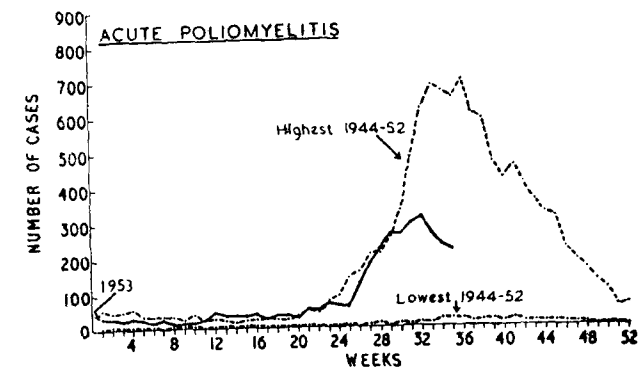
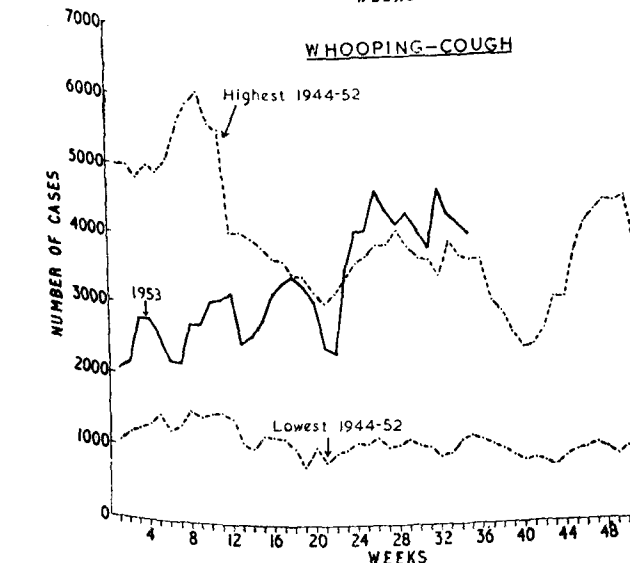
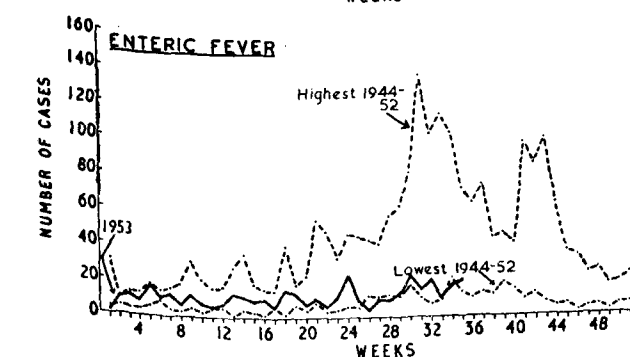
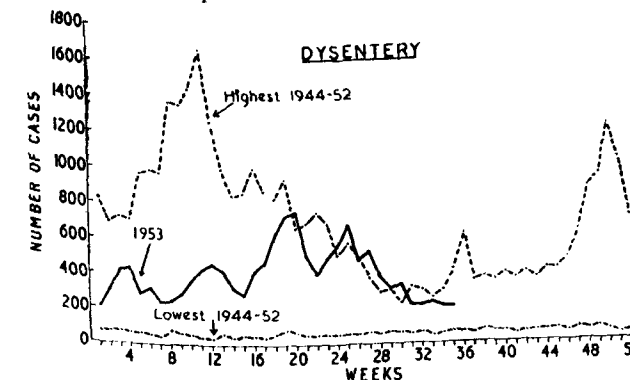
Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending September 12 (36th week of the year) were as follows: paralytic, 92 (123); non-paralytic, 81 (101); total, 173 (224). This is a decrease of 51 compared with the previous week, the figures for which are in parentheses. This is a fairly sharp fall, and suggests that the peak has been passed and that the expected seasonal recession has begun.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ———, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest variations in the number of notifications of infectious diseases in England and Wales during the week ending September 5 were falls of 247 for measles, from 1,049 to 802, and 112 for whooping-cough, from 4,170 to 4,058, and a rise of 40 for scarlet fever, from 443 to 483.

The incidence of measles is at the lowest level for the past four years. During the week reviewed a fall was recorded in all regions except the north-western, where a small rise occurred. The largest fluctuations in the returns of whooping-cough were a rise of 75 in Lancashire, from 262 to 337, and a fall of 48 in London, from 402 to 354. 20 cases of diphtheria were notified, being 4 more than in the preceding week. The chief features of the returns of diphtheria were a rise in London from 0 to 3, and in Plymouth C.B. from 1 to 4, and falls in Cheshire from 4 to 0, and in Durham from 3 to 0. Only small fluctuations occurred in the local returns of scarlet fever.

224 cases of acute poliomyelitis were notified during the week. These were 3 more for paralytic and 16 fewer for non-paralytic cases than in the preceding week. The largest returns were Warwickshire 22 (Birmingham C.B. 7, Coventry C.B. 10), Lancashire 20 (Blackpool C.B. 3, Liverpool C.B. 3), London 16, Dorsetshire 12 (Blandford R.D. 3), Surrey 11, Kent 10, Essex 10, Yorkshire West Riding 10 (Doncaster C.B. 3).

205 cases of dysentery were notified, being 1 fewer than in the preceding week. The largest centres of infection were London 43 (Chelsea 12), Lancashire 40 (Liverpool C.B. 10, Manchester C.B. 9), Yorkshire West Riding 21, Middlesex 16 (Willesden M.B. 6), Durham 12 (Stanley U.D. 6), Kent 10 (Chislehurst and Sidcup U.D. 8), and Essex 10.

Week Ending September 12

The notifications of infectious diseases in England and Wales during the week included scarlet fever 505, whooping-cough 3,708, diphtheria 19, measles 603, dysentery 204, paratyphoid fever 11, typhoid fever 6, and food-poisoning 244.

The Services

Surgeon Commander H. R. I. Wolfe, R.N.V.R., has been awarded the Royal Naval Volunteer Reserve decoration. Lieutenant D. A. Cahal, Royal Regiment of Artillery (now R.A.M.C., T.A.R.O.), has been awarded the Efficiency Medal (Territorial).

Air Commodore P. B. Lee-Potter, C.B.E., R.A.F., has been appointed Honorary Surgeon to the Queen in succession to Air Vice-Marshal W. E. Barnes, C.B.E., R.A.F., who has vacated the appointment on retirement from the R.A.F.

A Supplement to the *London Gazette* has announced the following awards:

Third Clasp to the Territorial Efficiency Decoration.—Colonel W. R. Ward, T.D., late R.A.M.C.

Second Clasp to the Territorial Efficiency Decoration.—Colonels H. Sissons, O.B.E., T.D., and W. R. Ward, T.D., late R.A.M.C., Lieutenant-Colonel (Honorary Colonel) E. J. G. Glass, T.D., and Major B. St. J. Steadman, T.D., R.A.M.C.

Medical News

Auditory Training of Deaf Children.—A hostel for young deaf children and their mothers was opened last week at Castle Bar Hill, Ealing, by the Minister of Health, Mr. Iain Macleod. It has been provided by the board of governors of the Royal National Throat, Nose, and Ear Hospital with the objects of allowing mothers to watch the auditory training of their children and of learning how to continue it at home. The hostel will also provide facilities for the trial of new training methods. After congratulating the governors on the imaginative use to which they had put most of their endowment funds, Mr. Macleod described the present supply position of the N.H.S. hearing-aids. Over 312,000 aids had been fitted and distributed, and the waiting-list would be only the end of the beginning; it would be possible then to spend more time on the auditory training of those who received the aids, amongst whom children had always had priority. A new light-weight aid for children was being developed, and pilot trials had to take place, but meanwhile the improved Mark III Medresco aid, which had batteries only half the weight and size of the earlier models, was coming into production, and children would again have priority.

Surgery of Peptic Ulcer.—In a Hunterian lecture at the College of Surgeons last March Mr. F. A. Henley described an operation for peptic ulcer, consisting in replacing the resected portion of stomach by a segment of jejunum, which it is claimed obviates the post-gastrectomy syndrome. Messrs. Allen & Hanburys Ltd. have selected this operation for the subject of the first of a series of medical teaching films. The film, made by Stanley Schofield Productions Ltd., was given a private showing last week. It is in colour, with a spoken commentary, and the operative details are extremely clear. One apparent advantage of the operation is that the normal processes of digestion are retained; there is the usual delay in the "stomach," and the food traverses the duodenum, where bile and pancreatic juice can mix with it. The operation is used routinely for cases of peptic ulcer needing surgery, to relieve severe post-gastrectomy symptoms, and for malignant disease of the stomach. Copies of the film may be obtained from Messrs. Allen & Hanburys Ltd., Bethnal Green, London, E.2.

NAPT Hunter Scholarships.—The National Association for the Prevention of Tuberculosis announces four scholarships for doctors and medical students, made possible through the generosity of a private donor, to be known as the Hunter Scholarships. The first is a postgraduate scholarship of £350 to enable a graduate of a British medical school, resident in the United Kingdom, to spend six months abroad studying the control of tuberculosis. The second, also of £350, is to enable a young graduate from any medical school in the British Commonwealth outside the United Kingdom to study tuberculosis in Britain. In addition, two scholarships of £150 each are offered to medical students, of either sex, who have been seriously handicapped through tuberculosis, to enable them to complete their training at any medical school in England or Wales. Inquiries about the scholarships should be sent to NAPT, Tavistock House North, Tavistock Square, London, W.C.1. The closing date for applications for the scholarships is March 31, 1954.

United States Research Fellowships.—In response to a request from the Organization for European Economic Co-operation, the United States Government has provided over \$1m. to enable 150 outstanding young scientists from Europe to travel to and live in the United States for up to two years in order to study in American research institutions. The National Academy of Sciences, Washington, is administering the scheme, and the Royal Society has been asked to

advise on the selection of candidates from the United Kingdom. About 25 fellowships will be open to candidates from the United Kingdom. No age limits are specified, but it is expected that most of the successful candidates will be between 26 and 32 years of age. Applications will be considered from candidates who propose to do research in the natural sciences and in the engineering, agricultural, and medical sciences, but excluding clinical medicine. Candidates must be in possession of a doctoral degree in science or have had equivalent experience. Applications, which may be made at any time, will be considered at regular intervals. For the first two sets of applications the closing dates are respectively October 1 and November 30, 1953. Forms of application and further information are obtainable from the assistant secretary, The Royal Society, Burlington House, London, W.1.

South African Medico-Legal Journal.—The Medico-Legal Society of Johannesburg is sponsoring a new medico-legal journal, the *Journal of Forensic Medicine*, under the editorship of Dr. H. A. Shapiro. The event is of more than national interest, as there is only one other similar journal written in English—the *Medico-Legal Journal*, which is published in Britain. The new journal will appear quarterly to begin with, and is intended for accounts of original research in forensic medicine and for case reports; it will also include reviews, abstracts, and medico-legal news. It is stated to be international in scope. The journal is published by Juta and Co., P.O. Box 30, Capetown, at an annual subscription of two guineas.

COMING EVENTS

Contraceptive Technique.—A lecture and demonstration on contraceptive technique will be given by Marie Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on Thursday, October 1, at 2.30 p.m. No fee is charged, but tickets must be obtained in advance as space is very limited.

King's College Hospital Medical School.—The inaugural address will be delivered by the Rt. Hon. Iain Macleod, M.P., at the Medical School, Denmark Hill, on October 2 at 2.30 p.m. Sir William Gilliatt will preside.

Royal Free Hospital School of Medicine.—The inaugural address will be delivered by Miss G. E. M. Jebb in the Beveridge Hall, Senate House, University of London, W.C.1, on October 2 at 3 p.m. Miss Jebb's subject will be "The University Student in the World To-day."

Faculty of Medicine, Sheffield University.—The opening sessional address will be delivered by Professor L. J. Wits in the Frith Hall of the University on October 8 at 5 p.m. Professor Wits will take as his subject "The Opportunities of Medicine."

SOCIETIES AND LECTURES

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

Monday, September 28
CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.—5.30 p.m., Mr. Grayton Brown (Melbourne): Surgical Treatment of Duodenal Ulcer by Antro-duodenectomy.

Tuesday, September 29
SOCIETY OF INSTRUMENT TECHNOLOGY.—At 26, Portland Place, London, W.—6.30 for 7 p.m. Dr. C. N. Smyth: Electrical Techniques in Medicine with particular reference to the Measurement of Pressure and of Strain.

Wednesday, September 30
CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 8.15 p.m. Clinical meeting.
MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m.—annual meeting. Valedictory Address by Dr. W. Watson Newton: Mesmer, Mind, and the Emotions.
ROYAL SANITARY INSTITUTE.—2.30 p.m., discussion: Future of B.C.G. Vaccination in Great Britain. To be opened by Dr. J. Lorber and Dr. K. N. Irvine.

Friday, October 2
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. Stephen Rothman (Chicago): Clinical Demonstration.
SOCIETY OF CHEMICAL INDUSTRY: CROP PROTECTION PANEL OF THE AGRICULTURE GROUP; ASSOCIATION OF APPLIED BIOLOGISTS; SOCIETY OF PUBLIC ANALYSTS; and PHARMACOLOGICAL SOCIETY.—At Imperial College, Imperial Institute Road, Kensington, S.W.—Joint Symposium: Organophosphorus Insecticides. Morning session, 10.30 a.m. to 12.45 p.m. Afternoon session, 2.15 p.m. to 5 p.m.

Any Questions?

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

Scarlet Fever and Nephritis

Q.—Is it correct to treat scarlet fever cases, however mild, by rest in bed for at least two weeks in order to reduce the incidence of nephritis? If this is so, should not all cases of haemolytic streptococcal sore throat be treated in the same way for the same reason?

A.—Post-scarlatinal nephritis is regarded, probably correctly, as a toxic-allergic manifestation. There is no conclusive evidence that patients allowed up early are in greater danger of developing nephritis. When the disease was common, and dangerous, nephritis occurred even in the most carefully nursed cases, but only rarely in those efficiently treated with antitoxin. Nevertheless it is probably unwise to submit to strain and overactivity organs that have recently been subjected to a toxic or bacterial attack, and for this reason alone it is wiser to allow reasonable rest after the temperature has subsided.

Many authorities allow the discharge of patients from hospital about one week after onset of the disease; it is commonplace to release patients in from ten to twelve days. And this would not be practised if it were thought that a greater risk of nephritis would result.

Not all streptococcal throats are caused by scarlatinal strains, and some scarlatinal strains are poor toxin producers. The nephritic reaction is almost certainly linked with the specific toxin. Furthermore, the patient with a scarlatinal streptococcal tonsillitis may have a high immunity to the toxin. It is probable, therefore, that streptococcal throats without rash are even less likely than scarlet fever to end in nephritis.

Partial Impotence after Mumps

Q.—Three years ago a man of 57 had a bilateral mumps orchitis, and since then he has lost the full power of erection, although retaining his libido. This difficulty is overcome by giving 5 mg. testosterone daily. Are there any risks in continuing this treatment indefinitely? Is there a risk, for instance, of benign or malignant changes in the prostate?

A.—Mumps is more likely to attack the seminiferous tubules than the interstitial cells, but sometimes does destroy the latter and cause failure of testosterone secretion with resulting loss of potency. The small dose of testosterone that is given in this case—and I would conjecture that it is in the form of methyltestosterone—would be unlikely to influence such a loss of potency except by suggestion, so that one cannot rule out psychological impotency in this case. If, on the other hand, larger doses were required and the response was clear-cut, organic impotency responding to substitution therapy would be the correct diagnosis. There are no risks from small doses in regard to the effect on other endocrine organs or on the prostate. There is no clinical evidence that larger doses have a harmful effect on the prostate but conceivably such doses could produce a disturbing enlargement beyond the physiological. There is no evidence that malignant changes in the prostate would result. Methyltestosterone is not excreted as an androgen in the urine, and in this is unlike testosterone. It is inactivated by some process in the liver; it does not increase the urinary 17-ketosteroids, whereas testosterone does. However, probably because of these differences, methyltestosterone has been recorded as producing a form of jaundice with changes in the liver. This is a rare complication, and the present

writer has not met with it, although he uses methyltestosterone fairly extensively, but there would appear to be no doubt about its reality as a rare complication. This raises an important point as to whether methyltestosterone should ever be prescribed. At the present moment those who have met with the complication take the view that nevertheless methyltestosterone should be prescribed where it is indicated. The alternative method of giving androgens is to inject testosterone propionate, and if this is used in the form of testosterone-phenylpropionate the duration of action is some two weeks, which is a great improvement on daily injection. Another lasting method is the subcutaneous implantation of testosterone, the effect lasting some six or eight months. Testosterone cannot be given by mouth in the same way as methyltestosterone can, because it is largely inactivated. The same would apply to its absorption under the tongue, which method is used effectively for methyltestosterone.

Why Do Children Turn Their Toes In?

Q.—What is the cause of children walking with their feet turned inwards?

A.—During the early stages of walking most children develop bow-legs, knock-knees, or both. In the vast majority these deformities disappear spontaneously; they are in no way related to rickets. It is usually taught that these children turn their toes in because they are trying to improve their balance. With knock-knees there is necessarily eversion of the foot and usually also external rotation: by reversing this a steadier base is obtained; thus the child learns to internally rotate his legs to avoid falling. These cases seldom need any treatment.

Apart from this, there are causes of a more serious nature: congenital talipes equino-varus, or a metatarsal varus with actual deformities of the metatarsals and tarsal bones, is usually obvious; much less obvious is the internal rotation seen in a spastic child. Apart from these structural causes, there is unlikely to be anything else very wrong with a child that turns its toes in.

Faulty Absorption after Partial Gastrectomy

Q.—What are the likely causes of bulky, pale, offensive stools and low weight following a partial gastrectomy two years ago for duodenal ulcer? What treatment is suggested?

A.—Faulty absorption of fat and other food materials may follow partial gastrectomy. There are various causes of this defective absorption, and investigation of the gastrointestinal condition is required to establish the facts in each case.

A not uncommon finding is that the food passes rapidly out of the stomach remnant and thus tends to get ahead of the pancreatic and biliary juices, which cannot mix properly with it. This may result in delayed absorption and consequent bacterial changes in the lower part of the small intestine. Bacterial activity is likely to cause bulky, pale, and offensive stools. Defective absorption of water and possibly some food materials may account for loss of weight. Occasionally an error of technique at operation has led to the stomach being anastomosed to the lower jejunum or even the ileum, and in such cases proper digestion of the food is almost impossible. Apart from a full investigation of the stools it is clearly of importance to have a barium meal and follow-through examination to determine whether there is any gross anatomical abnormality. It also appears that excessive length of the afferent jejunal loop will contribute to this trouble, but to a lesser extent; in the same way an unduly radical gastrectomy, by encouraging too rapid emptying of the stomach, may also be a factor.

If investigation of the gut does not disclose some error of technique which can be remedied by further operation the treatment must be planned on the following lines: the taking of food should be spread over a reasonably long period to enable the pancreatic and biliary juices to mix with as much of the meal as possible. The meal may be

started with the ingestion of food which does not require pancreatic and biliary digestion, but which nevertheless stimulates the gastro-intestinal secretions in time for the arrival of the less easily digestible food. Alternatively, predigested foods or a potent pancreatic extract, intimately mixed with the food, may be taken at the start of each meal.

T.A.B. after Typhoid

Q.—Is it worth giving T.A.B. to a person who has recently had a severe attack of typhoid fever and is going to a country where both paratyphoid and typhoid are quite common? If inoculation is recommended, is the previous attack of typhoid likely to cause a particularly severe reaction?

A.—Second attacks of typhoid fever are rare, so that there is no indication for immunization against typhoid itself after an attack of the disease. Paratyphoid is a much milder infection and responds to chloramphenicol therapy. It must also be remembered that T.A.B. will not necessarily protect an individual against infection, particularly in countries where the risk of eating heavily contaminated food is considerable. The degree of reaction to T.A.B. vaccination is not likely to be affected by a previous attack of the disease but seems to depend more on individual idiosyncrasy. While, therefore, there is no great likelihood of severe reaction, there seems in this case to be no strong indication for prophylactic immunization.

Dermatitis Herpetiformis

Q.—What is the best treatment for dermatitis herpetiformis? Is autohaemotherapy any good? If so, how is it given? The patient in question is intolerant of arsenic, and neither chloramphenicol nor sulphonamides have been successful.

A.—Dermatitis herpetiformis proper is essentially an affection starting in early adult life and lasting very many years, but after the first few years the discomfort abates and ultimately active treatment is not necessary.

Arsenic, which is usually effective in controlling the affection, should not be employed in a chronic disease of this type, neither should chloramphenicol. Sulphonamides as such are of no value, but sulphapyridine, because of the pyridine ring, almost invariably controls the affection and appears to be safe in these patients, though the ordinary safeguards should naturally be employed. Other allied drugs, thiouracil, etc., are effective, but sulphapyridine is the best. 0.5 g. taken with meals three times a day rarely needs to be exceeded. Periodically the blood picture should be looked at. Autohaemotherapy has not proved of much value. It is conducted by taking 5 or 10 ml. of blood from a vein in the elbow and immediately injecting it into the muscles of the buttock.

It should be mentioned that, particularly in older patients, dermatitis herpetiformis, or an exactly similar eruption, may be dependent upon some organic disease, especially malignant disease internally.

Peeling Onions

Q.—Why do onions make the eyes water?

A.—The pungency of onions, and presumably their effect on the eyes, is attributed to volatile sulphur compounds. Allyl isothiocyanate, which is typical of this class of compound, is found in the horseradish and other plants.

Deafness on Board Ship

Q.—I have a slight nerve deafness for the higher tones. I always become quite deaf on board ship, with a tendency to excessive meatal secretion. Why is this?

A.—One possible reason for nerve deafness becoming more noticeable on board ship would be the constant noise of the ship's engines. Any person with high-tone deafness due to changes in the organ of hearing is likely to find that the hearing becomes less acute in the presence of any background noise. On the other hand, if there is naturally

some external otitis causing meatal secretion other than wax, then any increase in the secretion may block the meatus and so make the hearing defect worse. There is no particular reason why sea air should increase a tendency to excessive meatal secretion, though it might be caused by using salt water for washing purposes.

Vitamin B₁ and Parkinson's Disease

Q.—Does vitamin B₁ have any specific action in Parkinson's disease? A patient is greatly improved on 200 mg. weekly of the vitamin.

A.—Vitamin B₁ is not recognized to have any specific effect in Parkinson's disease.

NOTES AND COMMENTS

Immobilization in Spinal Tuberculosis.—Dr. K. W. TODD (Port Moresby, Papua) writes: In "Any Questions?" (*Journal*, April 25, p. 952) you were asked the best way of immobilizing cases of spinal tuberculosis. It would appear from the reply that Dr. Rollier's method, despite his experience and eminence, is little known. May I describe it? "Where is the fracture in Pott's disease?" said he. "In the body of the vertebra. Where is the sound structure to form a fulcrum? In the spinous processes and interspinous ligaments. How can you extend the fractured bone and separate the fragments? By nursing in the prone position, preferably with the chest and shoulders raised by the elbows." It was in this admirable position that Rollier's patients had heliotherapy. For greater ease, they had rings tied into the bed to prevent the elbows from slipping. This was just before streptomycin, and it may be that the period of bed immobilization is now shorter, and that a plaster is necessary for ambulant treatment.

OUR EXPERT writes: Rollier's methods are of course well known in this country, but his views are not entirely accepted, and in most hospitals in this country nursing supine with or without hyperextension is considered the preferable method, as only by it can adequate immobilization be achieved. Nursing prone with chest and shoulders raised is used in the early convalescent period to aid muscle recovery. The Rollier method's great disadvantage is that it does not provide adequate immobilization and needs constant supervision.

Filatov's Tissue Therapy.—Mr. E. GORDON MACKIE (Sheffield) writes: In "Any Questions?" (September 12, p. 634) an inquiry about Filatov's tissue therapy is answered—but it is incorrectly stated that "it is not a technique that has been studied elsewhere" (than in Russia). A paper "Placental Implantation for Retinitis Pigmentosa" was read by me at a joint meeting of the Royal Society of Medicine, Section of Ophthalmology, with the North of England Ophthalmological Society on April 20, 1951, in Sheffield. An abstract is to be found in *Proc. roy. Soc. Med.*, 1951, 44, 977. It compares the results reported by 20 workers (16 non-Russian) in this and certain other ophthalmic diseases and it cites (with references) certain parallel work in general surgery. Your inquirer might be interested in the information thus available.

Correction.—In a letter about neonatal asphyxia published in the *Journal* of September 19 (p. 675) Dr. David Morris discussed Akerren's method of resuscitation with intragastric oxygen. We should have made it clear that the hospital where he described it as being regularly used is the British Hospital for Mothers and Babies, Woolwich, London, S.E.18.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Aitiology, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 3 1953

TREATMENT OF CANCER OF THE LARYNX BY INTERSTITIAL RADIUM NEEDLES

BY

W. DOUGLAS HARMER, M.C., F.R.C.S.

Consulting Surgeon to the Throat Department, St. Bartholomew's Hospital; Consulting Surgeon to Mount Vernon Hospital and the Radium Institute

The object of this investigation was to ascertain the value of interstitial radium needles in the treatment of cancer of the larynx and to compare it with other methods. This subject has not received as much attention as it deserves. Since 1924 120 patients have had operations with the help and advice of colleagues in the cancer departments of St. Bartholomew's Hospital, Mount Vernon Hospital, and the Radium Institute.

In so limited a space it is not possible to name all the "happy band of brothers," but I am especially indebted to Finzi for suggesting that the method should be tried, to Stanford Cade for his valuable advice and co-operation during at least 20 years, and to a number of distinguished physicists, particularly Gray and Neary, who have planned the method of delivering the best dose to the different parts of the larynx, and lastly to my son, who has helped me in the preparation of this paper.

All these patients have been followed up, with the exception of two who left the country within a few months of their treatment and who have been omitted: in one the growth had already disappeared, so that the outlook was favourable, and the other, with an advanced growth, has been assumed to have died of cancer.

Up-to-date reports of all these are recorded. A few that were lost after five years have been listed to the date of their last record.

Clinical Features

Before describing details of treatments some remarks about these cancers are advisable.

Aetiology.—Cancer of the larynx occurs chiefly in males (only 13% in females). Most of our patients were between the ages of 50 and 65. The oldest was 78; the youngest 20. During 55 years in practice I know of only one earlier case—that of a boy of 9½, seen recently in consultation with Mr. James Crooks, who performed a laryngo-fissure and who has since published this interesting case, which I have not included in my series. Nothing was discovered about causation, but a number of these patients stated that their symptoms started after influenza, and one young woman, who was apparently cured by radium needles for two years, had a rapid recurrence following a pregnancy and died in six months. Normally intrinsic cancer grows slowly, but the rate of growth is quite unpredictable. Thus, a

patient from India with hoarseness for about a month had a small localized lesion like a simple wart. As the section showed carcinoma he was treated by laryngo-fissure and the whole of his vocal cord was removed. His wife was assured that the outlook was excellent. In a short time, however, it became obvious that the disease had not been arrested, and he died six months later with large metastases in the cervical lymph nodes. The same may happen with growths elsewhere in the throat. A doctor had a small pedunculated wart the size of a pea on his tongue which looked like a simple papilloma. The biopsy report stated, "No evidence of carcinoma." Bilateral metastases were noted soon afterwards and grew rapidly, and when he died in six months they were as large as hens' eggs. Small pedunculated lesions in the upper air passages may be very malignant and incurable.

Symptoms.—It has long been accepted that the shorter the history of hoarseness the better the outlook, but, strangely enough, this statement is not always reliable. Table I gives the histories in 89 patients. It shows sur-

TABLE I.—Length of History

	Months				Years						
	<3	3	6	9	1	2	3	4	5	7	10 15
No. of cases	2	19	15	11	11	16	6	4	1	2	1
3-year survivals	0	11	6	5	5	7	2	2	0	0	1

prisingly little variation in survivals after three months. Although the numbers are small it is still not clear why this should be so. It seems that the outlook depends more on situation, type of lesion, and resistance to cancer. A man with a short history may be more difficult to cure than another who has had trouble for years. Incidentally, people who have lived in the Tropics for many years, who have led a sedentary life, or who have eaten and drunk too much seldom survive for long. On the other hand, another patient with 15 years' hoarseness and a very extensive growth involving the cartilages on both sides was needled and lived free of disease for 10 years. Presumably, a patient's resistance to cancer may be lower at the beginning of the disease than after a number of years. Whatever the explanation, some patients respond surprisingly well and others put up no fight at all.

Situation.—It is not known why cancer in one part of the larynx can be cured so easily whereas with a similar growth in another place a patient rarely survives for long. A good instance is cancer of the epiglottis; on the tip it may be so comparatively innocent that it can safely be treated with transoral diathermy excision, while on the base it is a dangerously malignant cancer which can seldom be cured even by wide laryngectomy. It is therefore enormously important to know how the disease behaves in different situations.

Biopsy.—This should always be made, and be repeated if necessary. The report may be negative. Several of our patients required three or more biopsies. If the disease is clinically malignant it should be treated as such. No patients had sarcoma, and personally I have seen only two cases. Generally speaking, the low-grade cancer has the best prognosis, but in the larynx the situation is more important than the histology. Most of our cases had biopsies. Many years after needling, Dr. Ruth Pearson examined the sections of 48 patients at my request and attempted to foretell the outcome according to Broders's grading. The results are expressed in Table II, which appears to show that, contrary to present-day opinion, grading is of considerable value.

TABLE II

	No. of Cases	Clinical Stage		Outcome	
		Early	Advanced	Lived or Died Free of Cancer	Died of Cancer
Broders's stages 1 and 2	24	6	18	15	9
" " 3, " 4	24	5	19	9	15

Clinical Stages

There are three main stages:

I. Early Intrinsic

(37 patients—31% of total reported.) Here the lesion is strictly confined inside the cavity of the larynx. It is usually a small, slowly growing warty lesion localized to the anterior part of the vocal cord and occasionally spreading to the anterior commissure or to the opposite cord. It involves the mucous membrane only, and can often be stripped off without damaging the muscles of the cord (Fig. 1). In fact, when doing a biopsy it is important not to bite too deeply for fear of making a notch which may damage the voice permanently. In rare cases a growth may

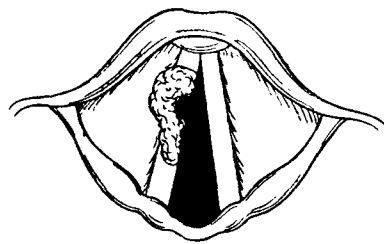


FIG. 1.—Stage I. Early intrinsic.

be hard and ulcerated, which is a more serious condition. If the lesion extends below the cord it is no longer a stage I type. Early lesions often grow slowly and have long histories of hoarseness. They never invade the cervical lymph nodes. At least 80% are curable.

II. Advanced Intrinsic

(72 patients—62% of total reported.) When first examined these growths are nearly all very advanced, but without enlarged nodes. Incidentally, it is extremely difficult to decide how localized they are, particularly when the cord is immobile. Usually the whole vocal cord is involved and the lesion sometimes spreads to the anterior commissure, the base of the epiglottis, the arytenoid or subglottic space (Fig. 2). Sixty were unilateral, while twelve of them had bilateral lesions which had spread across the anterior or, rarely, the posterior commissures. Eight of these had

no tenderness or external swelling, but, when exposed, the growths had perforated the membranes and invaded or softened the cartilages, usually at the lower border of the thyroid cartilage or through the crico-thyroid membrane. Only one of them was cured for six years. Fig. 3 shows such a case in which a localized lesion which seemed superficial was found at operation to have penetrated the cartilage and so could not be included in stage II.

Clinically, there are two groups which help to decide the treatment. (a) The large, soft, cauliflower, non-ulcerated type, with a freely movable vocal cord and therefore no deep infiltration. Radium needling should be tried before laryngectomy. Thirty-three patients were treated, many with good results. (b) The hard, nodular, ulcerated type with a fixed cord, which signifies deep extension of the disease. Without operation it is impossible to determine how serious this is, but 39 were deliberately treated and some of them were cured. Nearly all these lesions were temporarily improved, and the ulceration usually disappeared.

The neck should always be examined to ascertain if there is any external swelling or thickening of the larynx. If on firm pressure the patient complains of tenderness or pain on the affected side, perichondritis should be suspected.

III. Extrinsic

(9 patients—7% of total reported.) Here the lesion is no longer confined inside the larynx. Two different types must be included.

(a) The growth which starts in the larynx and then spreads upwards to the base of the epiglottis or tongue or over the lateral fold to involve the pharynx or pyriform fossa, below the vocal cord to the subglottic space or trachea, posteriorly to the arytenoid cartilage or to the post-cricoid region (Fig. 4). All such cancers progress rapidly, and these patients seldom survive for more than a year if untreated.

(b) Here the cancer starts either on the margin of the larynx or on the neighbouring part of the pharynx, spreading later into the larynx.

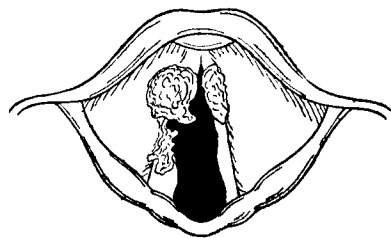


FIG. 2.—Stage II. Advanced intrinsic.

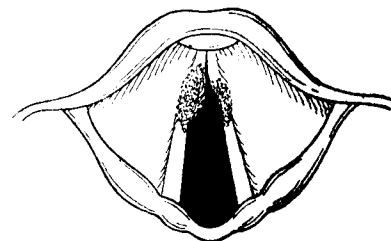


FIG. 3.—Apparently intrinsic (stage II) found at operation to be perforating thyroid cartilage (stage III).

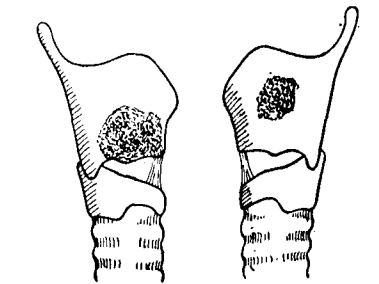


FIG. 4.—Extrinsic (stage III).

In the 1945 annual report of the B.E.C.C. dealing with extensive cancer of the larynx, the site of origin was given as follows:

Pyriform fossa	..	..	males 137	..	females 12
Post-cricoid space	..	..	22	..	68
Aryepiglottic fold	..	..	42	..	4
Vallecula and epiglottis	..	..	61	..	4

Such growths are always very malignant and progress rapidly, and the patients rarely live (untreated) for as much as a year. Involvement of the lymphatic nodes is common. The same report described: no nodes, 49; enlarged nodes, 81; nodes and adjacent tissues involved, 244; distant metastases, 9. To emphasize their virulence it was stated that, in spite of treatment, chiefly irradiation, only 15 cases survived for five years. With modern treatments much better results are now obtained.

Choice of Treatment

These can be considered historically. The first attempt to cure cancer was naturally by surgery.

Laryngectomy

In 1863 the first laryngectomy for papillomata was performed by Sands (Canada); in 1866 Patrick Watson (Edinburgh) removed a larynx for syphilis; and in 1873 Czerney and Billroth performed another laryngectomy for cancer. In 1887 the German Crown Prince contracted cancer, and von Bergmann advised this operation. When pressed, this great surgeon said that he had performed it seven times, with an average survival of 19 days. His advice was not accepted. But the prince's illness caused enormous controversy and Queen Victoria sent Morell Mackenzie to advise her son-in-law, greatly to the annoyance of the German surgeons, who walked out. The prince lived for just under a year, long enough to become emperor.

The years 1870 to 1900 can be described as the age of laryngectomy. During this period many larynges were removed, but nearly all the patients died of bronchopneumonia, sepsis, and heart failure. With antibiotics and modern anaesthesia laryngectomy can now be safely performed by surgeons who have sufficient experience of this operation. The mortality should be 2 to 3% provided the general health of the patient is good. It has always been a popular operation for all stages of the disease, and it is still regarded by many surgeons as preferable to other methods, particularly in Europe and America. But it is still a difficult operation for general surgeons, and for the patient is a great handicap. No patient should be told that it is the only safe treatment; nor can it be pretended that it will make no difference, for it often causes great depression. The patient should realize that only about 15% of them get good voices.

To-day there are simpler treatments which can safely be tried first. Without doubt laryngectomy is quite unnecessary for early lesions; before long it may even be found that radiotherapy in some form may cure a number of advanced cancers, and it will not be surprising if pre-operative ray treatments make laryngectomy more successful. For extensive cancer it is a very good treatment. Recently there have been improvements in technique and it has been found that the best results can be obtained only by very wide excisions, with removal of enlarged cervical lymph nodes in one block, preferably at the same operation. To be successful the sterno-mastoid muscles are usually removed. The internal jugular vein is tied on the affected side. Some surgeons now tie both veins. Even very extensive disease involving the pharynx, post-cricoid region, and nodes can now be treated successfully by laryngo-oesophago-pharyngectomy.

Laryngo-fissure

In 1900 Butlin and Semon published a paper showing that "thyrotomy" (as they called it) and local excision of early localized cancers of the vocal cord produced as many cures as laryngectomy, with far less mutilation. This

created a sensation and was vigorously contested. For many years it was unpopular in all other countries except England, but before long StClair Thomson, Chevalier Jackson, and the Mayo Clinic published a large series of cases with 75% of five-year survivals. It was always a good operation and still is the best surgical treatment for early lesions. It is a treatment which can be perfectly well carried out in any general hospital by an experienced surgeon. The mortality should be negligible. Nearly all patients have a useful voice afterwards, enabling them to carry on their occupations. A word of caution is necessary. Laryngo-fissure must be undertaken only for the removal of superficial growths which are absolutely localized to the anterior part of the cords. Even a growth which extends into the anterior commissure and affects only a small part of the opposite cord can be successfully removed, but any wide excision of both vocal cords is apt to cause stenosis and the voice may be seriously damaged. As has already been explained, it is sometimes difficult to be certain that the growth is entirely intrinsic, particularly if it is ulcerated and causing loss of movement of the cord. If the cord is completely immobile the disease is probably too advanced for local excision. Undoubtedly, early lesions can now be safely treated by laryngo-fissure.

Radiotherapy: 1. High-voltage X Rays

In 1898 Lewis Jones, using small tubes, began treating cancer with small doses for long periods, up to six months, at St. Bartholomew's Hospital. Since then an enormous amount of money has been invested in equipment which has been improved almost yearly. A colossal amount of research has been done by scientists, and accurate doses can now be given even to deep-seated lesions. More patients have been treated by x rays than by any other method. The medical profession and their patients have been told that it is safer than surgery and gives equally good results. As more powerful tubes have become available with an output of millions of volts, and of course costing more and more, the public have been assured that even better results will be obtained.

Unfortunately x-ray therapy has been disappointing. Cures are still reported only by special cancer clinics using the latest high potency equipments and by very experienced specialists. Radiotherapists should not treat cancer of the larynx with inferior equipment. They have no hope of good results.

To justify such an assertion it is necessary to analyse the evidence to support it. This can easily be obtained from the general hospitals. There can be little doubt that their x-ray treatments for cancer of the larynx have been a failure. It is extremely doubtful whether this bad habit will be cured for a long time: it has obtained such a hold on the public, in spite of its being a long harsh treatment lasting from six to eight weeks. The patient's health often suffers, severe reactions are common, hoarseness and pain persist, the tissues remain swollen, and it may be very difficult to decide whether the growth has been arrested. These signs may be due to perichondritis. Lastly, the skin and deep tissues may be damaged. After a time a new doctor may be consulted and the patient is told that he requires "a few more rays." Repeated ray treatments are often disastrous, and should rarely be given except for palliation of symptoms after recurrence. The following is a typical history:

A patient who complained of persistent hoarseness, probably due to perichondritis, was sent to the country to recuperate. The symptoms worried him, and he consulted a local radiotherapist, who, without a biopsy, advised "a few more x rays." A full course was started, but soon caused such inflammation that a tracheotomy became necessary. He suffered agonizing pain and died in six months.

It is only fairly recently that accurate localization of x rays has been possible. After a full course there may be severe reaction, and if the skin has been damaged healing may be affected.

A patient who had a recurrence two years after needling was treated with high-voltage x-rays and telerradium. Although the skin was scarred laryngectomy was risked. The flaps sloughed and when the wound had recovered a plastic repair with a large pedicle flap was performed, but this also failed to heal. Two further operations were necessary to close the fistula, but he died shortly afterwards of cancer.

Extrinsic cancer is hardly ever cured by x-rays alone, and never if the lymph nodes are diseased. But the treatment is of the greatest value for the relief of symptoms and for arresting the disease. Occasionally, dramatic results are obtained, and it is difficult to explain why this happens so rarely.

A woman aged 80 had an extensive carcinoma, which obstructed her larynx and required tracheotomy. A full course of deep x-rays was given by Finzi, and although the lesion did not shrink much it became inactive for four years, when she died of old age. Another cauliflower lesion almost filling the larynx in a man aged 79 entirely disappeared after x-ray therapy until his death. A still more remarkable cure should be mentioned. A man of 33 was treated by laryngo-fissure and remained perfectly well for 23 years. He then had a recurrence, and in a short time the growth fungated through the scar and tracheotomy became necessary. After x-ray therapy by Finzi in 1932 it disappeared and the patient is still living 20 years later, though a tracheotomy tube is necessary on account of stenosis.

2. Pre-operative Radiotherapy

It is known that even small doses of x-rays check mitosis temporarily and often shrink new growths to a large extent. In 1925 it was decided to give this treatment a trial: small doses totalling 1,000 to 1,500 r were given on three to five days and needles were inserted a day or two later. In all, 26 patients were treated as shown in Table III.

TABLE III

	Stage I (6 Cases)	Stage II (17 Cases)	Stage III (3 Cases)	Survival All Stages
3-year survivals ..	5	9	1	58%
5- " " "	5	7	0	46%

3. Telerradium

This seems to be a better treatment than high-voltage therapy for many deep-seated cancers in different parts of the body. For instance it is undoubtedly the best treatment for new growths in the tonsil and post-nasal space. This is fortunate, because surgery is useless. In the larynx it appears to be more successful than x-rays. It is less harsh, the reactions are milder, and the results are as good as any other treatment. Stanford Cade, to whom I am greatly indebted for advice for so long, has now abandoned other ray treatments, including radium needling, and uses the "bomb" for all stage I early lesions and for some intrinsic stage II growths. The Royal Cancer Hospital (London) has the largest series of laryngeal cancers in England. Lederer uses telerradium exclusively, and laryngectomy only for "failed bomb" cases.

To summarize, the drawback to both x-rays and telerradium is largely the cost. They require a house to live in, an apparatus which is more expensive each year, and which requires constant repairs—not to mention replacements—and a large and highly trained staff of specialists to run the ship. Obviously it will be impracticable for use in general hospitals, and it is unlikely that there can be more than a few of these units carefully placed in special cancer clinics throughout the country.

The Finzi-Harmer Operation

In 1924 Ledoux, of Brussels, described his "fenestration" operation, which consisted in removal of the cartilage from one side of the larynx and the insertion of short radium needles into the growth. After a visit to Brussels, where we saw some of his patients, it was decided to try the treatment. But to prevent disturbing the growth and risking

infection of the wound the needles were placed longitudinally outside the perichondrium covering the lesion. Our second patient, who had an extensive carcinoma and could only whisper owing to fixation of the vocal cord, had been advised to have his larynx removed, but when told that he could be treated by radium first he agreed to take the risk. He was cured by needling and remained well with a strong voice for six years, when he died, of all things, from psittacosis.

If the lesion is not causing severe obstruction to breathing and one vocal cord is moving, intratracheal anaesthesia is safe and preferable to local injections, but, to prevent troublesome bleeding, infiltration of the whole region with procaine and adrenaline is also advisable. The growth itself should not be infiltrated. Two incisions, 2½ in. (6.3 cm.) long, are made, one transversely above the thyroid cartilage with two-thirds of it on the affected side; the other vertically, over the side of the larynx to the upper rings of the trachea. Two skin flaps are turned laterally to expose the side of the larynx and the infrahyoid muscles. The latter are split from the hyoid bone to the trachea. Bleeding is arrested with coagulating diathermy or ligatures. A mastoid retractor is introduced to separate the muscles and to expose the lateral ala of the thyroid cartilage. The perichondrium is divided with cross cuts and reflected. The lateral ring of the cricoid cartilage is also exposed. With a small curved elevator the perichondrium under the lower margin of the thyroid is separated and a small piece of it is isolated and removed with cutting forceps. This is continued until nothing remains except a narrow frame along the upper and posterior borders. In front, the window should be carried almost to the middle line, leaving the centre keel intact. The upper edge of the cricoid ring is also stripped and notched so that the needles can be pushed under it (Fig. 5). The tissue beneath it is very thin and the dissection must be done with care. On no account must the growth or the larynx be punctured. As already stated, in advanced cases the growth may invade the perichondrium or even the cartilage. This is a serious complication, and unless the lesion is completely encapsulated it can seldom be cured by needling alone. Very rarely there may be upward extension of the growth to the base of the epiglottis, necessitating removal of the greater cornu of the hyoid bone (Fig. 6). The wound must be quite dry before the needles are inserted: each has two silk threads, and each one must be securely fixed with catgut sutures top and bottom.

Unfortunately, for six years it was not realized that the needles are apt to slip out of place and to bunch together: this happened to a distinguished physician who had an extensive bilateral growth for which seven specialists had

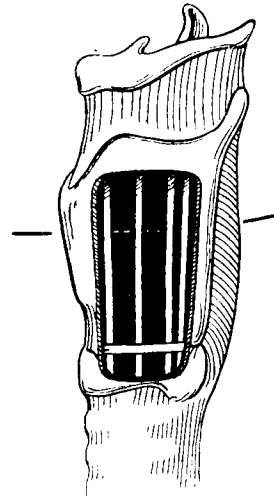


FIG. 5.—The fenestration operation.

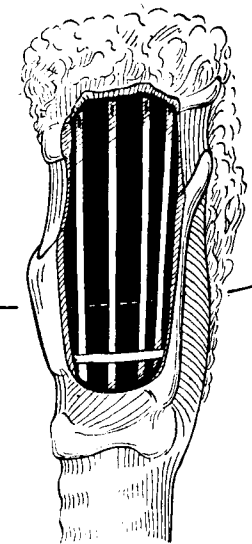


FIG. 6.—The extended fenestration operation.

needles are apt to slip out of place and to bunch together: this happened to a distinguished physician who had an extensive bilateral growth for which seven specialists had

needles are apt to slip out of place and to bunch together: this happened to a distinguished physician who had an extensive bilateral growth for which seven specialists had

vised laryngectomy as the only safe treatment (Fig. 7). had just heard of radium, and, although at that time only 16 patients had been treated with it, he decided to try it. A bilateral fenestration was performed. Afterwards, had such violent vomiting that an x-ray film was ordered, and this showed that all the needles had slipped and were

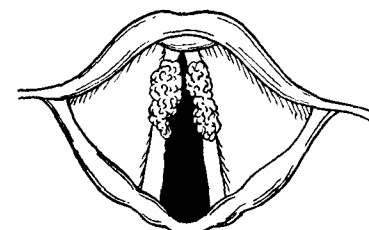


FIG. 7

er 24 happy years. Because of the possibility of the needles becoming displaced every patient must have a diagram taken 24 hours after operation.

Bilateral Fenestration.—Lesions of both vocal cords are difficult to cure, and unless the patient is well and has a sonant voice in two or three months laryngectomy should be performed. Fourteen patients had bilateral needling: one had fairly early lesions of the cords and was cured for 19 years. He then had a recurrence, but died after laryngectomy. Eleven had extensive lesions which could have been treated only with laryngectomies. Seven died in the first two years. One died of old age in five years. Three were living, for 8, 19, and 24 years, the last the physician mentioned above.

Before closing the wound the cavity should be powdered thickly with sulphathiazole or soaked with 1:1,000 acriflavine solution. The threads are then tied together securely and cut short near the bases of the needles, but leaving one long thread which is fixed to the skin and acts as a guide when they are removed. The infrahyoid muscles are sutured together with catgut over the needles to keep them close to the growth. The transverse skin incision is closed accurately with fine interrupted sutures, which are removed when the wound has healed. In the lower incision, double breads of different colours are inserted, one group cut short to close the wound until the needles are removed, the others kept long for tying afterwards. No drainage is necessary.

Tracheotomy.—From 1924 to 1936 it was difficult to gauge the dose, and later researches showed that this probably varied from 3,000 to 13,000 r in different patients. It is not surprising, therefore, that many of them had severe reactions, with redness, filming, and oedema—particularly of the arytenoid cartilages. For fear of dyspnoea eleven tracheotomies were performed, the tubes being retained until the reaction subsided. Tracheotomy caused serious complications. All the wounds became infected and discharged pus for several weeks. The inflammation sometimes caused necrosis of the cartilages, and healing was naturally very slow. Five other patients required tracheotomy for recurrence. Since 1936 no tracheotomies have been performed after needling. It was found that if a growth was large enough to cause serious obstruction to breathing fenestration was not advisable unless one vocal cord was freely movable. Temporary dyspnoea after the operation can be relieved by retaining the intratracheal tube if necessary for a day or two. If, however, the difficulty of breathing is severe the trachea can be exposed, but not opened unless it is absolutely necessary: only two of the patients required this.

Removal of Needles.—If the wound is not inflamed and there is no swelling in the larynx the needles are usually retained for a week. For removal gas and oxygen or thiopentone can safely be given. The lower wound is opened and the needles are easily removed. Usually there is a small amount of blood-stained serum. The wound should be

washed out with acriflavine, 1:1,000, and sutured completely. "Mastisol" is painted on the skin, which is covered with a thin layer of gauze.

Wounds which become seriously infected may be very troublesome. Haemorrhage, sometimes severe, may occur. Extensive sloughing of the tissues may be caused. It is in this type of wound that perichondritis supervenes. Later on it may be followed by necrosis. The treatment of infected wounds is important. All stitches should be removed. The wound should be widely opened, if necessary under an anaesthetic. Debris and sloughs should be removed. The wound should then be packed with gauze soaked in penicillin and sulphathiazole. If the dressing is repeated frequently serious infection is usually controlled in a few days unless there is a communication with the interior of the larynx at the time of the operation which caused the infection. Such wounds may take weeks to heal.

The Dose

A colleague lecturing to students about certain cancers said, "Use radium—plenty of it." This delightful aphorism does not apply to the larynx, which is a difficult customer to please. Great care must be taken not to overdose the patient. From the physical standpoint the great advantage of the radium implant is that irradiation is highly localized, so that there is the minimum interference with unaffected tissues. On the other hand, it is virtually impossible to give a uniform dose to the whole vocal fold by this method. It is true generally, however, that when an irradiated volume is fairly small some non-uniformity in the dose distribution is tolerable provided that the lesion itself receives an adequate dose.

In first treatments, from 1924 to 1936, eight 1-mg. needles were placed touching each other in the window, their ends being tucked under the upper margin of the thyroid above and the cricoid below. It was soon realized, however, that in the middle the dose was too high, causing severe reaction or even necrosis, while at the ends it was inadequate. It varied from 13,000 to 3,000 r. In an ideal arrangement the dose in a week should be about 6,000 r to the anterior half of the cord, but there is a marked fall posteriorly to 3,000 r and also below the free margin of the cord with such short needles of only 16 mm. active length. In spite of this some surprisingly good results were obtained, although these patients must have been overdosed.

Since 1933, when the practice of removing part of the cricoid cartilage was adopted, longer needles have been used though the total amount of radium was approximately as before. As a result, a more uniform distribution of dose is obtained, particularly below the vocal fold. It has been found beneficial to add a transverse 1-mg. needle at the lower ends of the vertical needles in those cases in which the level of the vocal fold is much below the midpoint of the fenestrated area—for example, in many females or in lesions with subglottic extensions.

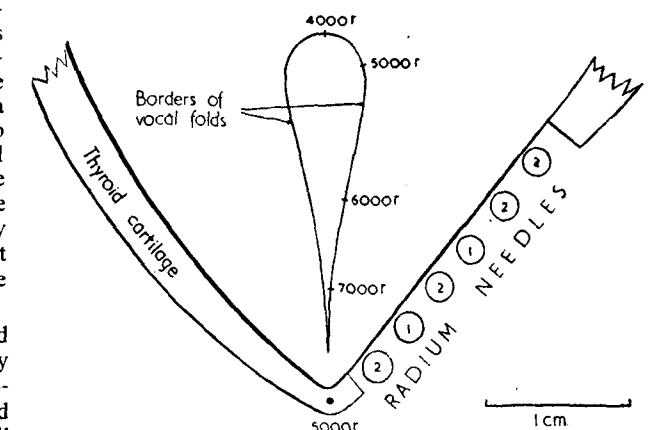


FIG. 8.—Dosage.

For stage I four 2-mg. needles of an active length of 32 mm. are inserted vertically and one or two 1-mg. needles transversely. The screenage of these needles is 0.8 mm. platinum, which is found to produce less local reaction than 0.5 mm.

For stage II rather larger doses are employed. Fig. 8 shows a transverse section of the larynx through the vocal fold for a typical implant of four 2-mg. and two 1-mg. needles (the second and fourth from the front) for a treatment time of one week. With this the anterior half of the vocal fold receives a dose of at least 6,000 r, and nearly all of the vocal fold at least 5,000 r. The fall-off in the dose towards the posterior end of the vocal fold may be partly counteracted by spacing the anterior needles, where the dose is high, rather more widely so that the posterior needles are closer together. In any event, the position of the needles in an implant should be checked the next day by a skiagram and the optimum treatment time for the required dose calculated. More detailed information about the dose distribution was given in 1944 in the *British Journal of Radiology* by Morton, Gray, and Neary, and there is also a good description of the operation in Ralston Paterson's *Treatment of Malignant Disease by Radium and X Rays*. An alternative method, using 1.5-mg. needles of 30 mm. active length, has been used for the vertical implant with a screenage of 0.6 mm., which appears to be nearly as satisfactory as 0.8 mm.

With a bilateral implant both sides contribute equally to the points exactly on the midline. But for a point which is not equidistant from the two implants the contribution from the implant further away is, of course, less than from the near implant. Thus the high local doses in the fenestrated area are not greatly increased by the presence of an implant on the other side. It is therefore difficult to decide, on physical grounds, how much radium is safe in a bilateral implant, since it is not enough to consider the dose at a single point, for no one point is representative for all. Except for very extensive lesions about 12 mg. seems enough.

The Voice

If treatment has been successful the growth soon begins to shrink and inflammation subsides in a few weeks; a fixed vocal cord becomes freely movable again and the resonance of the voice returns. If the disease is not arrested or if it recurs the voice does not improve. Persistent huskiness and swelling may be due to perichondritis or to growth or to both, and a biopsy should be made. Even when the growth is not arrested the report may be negative. In early stages it may be extremely difficult to distinguish these con-

ditions. If the symptoms do not improve within a month or two cancer must be suspected. It is a grave mistake to "wait and see."

Everyone knows that chemical sprays will kill weeds in a lawn and that the grass will recover. When radium is applied to a small localized growth the cancer cells die, the tissues recover, and the voice is normal. The majority of our successes have resulted in a perfect voice. When the voice remains husky it may be owing to damage when making a biopsy. A small notch may prevent perfect apposition of the cords, thus weakening the vibrations. But persistent hoarseness is a serious symptom. The treatment has probably failed, and a "spade"—laryngectomy—is advisable to dig out the weed.

To summarize, fenestration is a slight operation and can safely be performed by surgeons who have a good physicist to advise them about dosage. Not more than 12 needles are needed—a very small outlay. It is a short treatment which is completed in a week. For recurrence, if the lesion is still intrinsic, needling can be repeated. Since using well-filtered needles severe reactions have been rare. Redness, swelling, and filming are slight; oedema of the arytenoid cartilages is hardly ever troublesome. Perichondritis is uncommon and patients do not complain of dysphagia or dyspnoea. Without doubt, some of these patients could have been cured by early laryngectomies. With further experience, it will probably be found that a rule must be observed to remove the larynx unless it is normal in two months. In this series of patients very few laryngectomies were performed—and always too late.

Results

Of the 120 patients needled two went abroad and were lost sight of, as already mentioned. One was treated less than three years ago, so that 117 remain for follow-up analysis for varying periods, as follows:

Treated from 1924 to 1949, 3-year follow-up ..	117
" " " " 1947, 5- " " " "	111
" " " " 1942, 10- " " " "	92

Table IV expresses the results in terms of length of survival. The operative mortality must be regarded as high, but should be capable of improvement. Thus between 1924 and 1936 there were 6 deaths in 71 operations (8.5%), while between 1936 and 1951 there were 3 deaths in 49 operations (6.1%). Another feature of interest is that only five patients died of cancer after surviving for three years. There was no evidence, therefore, that metastases were common after needling. Cervical nodes were noted in only six patients, mediastinal deposits in five, and liver secondaries in only one.

TABLE IV.—Results of the Finzi-Harmer Operation: 1924-1951. 120 Patients Treated (2 Lost)

Result	Opn death	Survival in Years																								Total	
		<1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	19	21	24	26					
Stage I: Early Intrinsic, 37 Patients																											
Died of cancer or operation ..	1			2			1	2	3	2	1																4
Died intercurrent disease ..			1	1	1		1	1	1	2	1																16
Living: years after treatment ..			1	2	2	2	1	1	1	2	2	1	1	1	2	3	2				1				1		17
Survival { At 3 yrs.—32 patients out of 36 treated = 89% " 5 " —27 " " " " = 87% " 10 " —12 " " " " = 57%																											37
Stage II: Advanced Intrinsic, 72 Patients																											
Died of cancer or operation ..	5	9	13	9	6	1	1	2	2	1																	47
Died intercurrent disease ..					1	1	2	2	2	1																	15
Living: years after treatment ..					2	1	1	3	2	3	1			2	1			2	1		1			1			10
Survival { At 3 yrs.—36 patients out of 72 treated = 50% " 5 " —26 " " " " = 37% " 10 " —10 " " " " = 16%																											72
Stage III: Extrinsic, 9 Patients																											
Died of cancer or operation ..	3		1	4	1																						9
Survival at 3 years.—1 patient out of 9 treated = 11%																											
All stages:																										118	

Stage I: Early Intrinsic (37 patients).—Early lesions were confirmed by removal of the thyroid cartilage in every case. One patient died from the operation, three from cancer (one after 10 years), and sixteen from other causes. Seventeen are still living. Most of the survivors have strong resonant voices. The survival rates are shown in Table IV.

Stage II: Advanced Intrinsic (72 patients).—Usually these were unilateral, extensive, and apparently intrinsic with no enlarged lymph nodes. Twelve were bilateral. Soft tumours, if movable, responded better than the hard nodular ulcerated types. There were five operative deaths from chest infections, which were common when tracheotomies were performed, all of them before the introduction of antibiotics. Forty-two died of cancer, 31 in less than three years, six during the third year, but only five after this critical period. Among these 72 patients 26 survived with their larynges and excellent voices for periods ranging from five to twenty-four years. The survival rates are shown in Table IV.

Stage III: Extrinsic (9 patients).—These patients, who were found to have definite extrinsic lesions without obvious enlargement of cervical nodes, were needled and all of them died within three years. Needling alone has therefore been a failure. But, excepting for two who died of heart failure after operation, seven were temporarily improved for two to three years. Here again, laryngectomies should have been performed while the disease was arrested, and I regret that this was not done.

Summary

Lesions suitable for radium needling are therefore the following:

- (1) Early lesions (stage I). Even if the vocal cord is fixed. Lymph nodes are never affected in this group.
- (2) Localized lesions in the anterior commissure without involvement of the base of the epiglottis or of the tongue. In this region the dose is always a high one and needling usually succeeds in controlling the disease.
- (3) Extensive lesions that appear to be intrinsic (stage II).
- (4) Subglottic lesions (really stage III). In a few patients good results have been obtained and there is no risk in trying this treatment first, but laryngectomy should be performed early, in a month or two, if the swelling persists.
- (5) Lesions of the false cord and vestibule (stage III). These growths are unusually malignant and difficult to cure. Probably needling plus laryngectomy is the best treatment.

ENVOY

In putting on record the results of 30 years' work with this particular treatment for intrinsic carcinoma of the larynx it would seem to be reasonable to claim that the method has been unduly neglected. I am aware that as good figures have been published claiming that telerradium is superior to interstitial needling for early lesions. I have always maintained that cancer should be treated in special centres by the united efforts of a team of specialists in this disease. Yet there is still a place for simplicity in surgery, and no one can deny that the establishment and maintenance of a telerradium unit is extremely costly. Radiation techniques become increasingly complex and require more and more planning and space and time. The method which we have adopted (and which has been described, possibly a little grudgingly, as "a piece of brilliant empiricism") is relatively cheap and extremely simple in the hands of a competent surgeon. It gives really excellent results if used for the right patient. And it is here, of course, that the clinical experience gained in a long apprenticeship in laryngology counts.

The proof of the pudding is in the eating. I think that this has been a good pudding and that it would be a pity if the recipe were lost.

FOLIC-ACID-EXCRETION STUDIES IN THE INVESTIGATION OF MALIGNANT DISEASE

BY

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When a test dose of 5 mg. of folic acid is injected in a normal individual a significant proportion is promptly excreted in the urine. Most of this excretion occurs within a few hours, but for metabolic studies it is advisable to collect the urine for twenty-four hours after the injection. It has been shown that the urinary excretion of folic acid is diminished in many cases of pernicious anaemia (Bethell *et al.*, 1947; Girdwood, 1951, 1953). In a short review of the subject (Girdwood, 1952a) it was suggested that the controls used in the studies of pernicious anaemia patients were unsatisfactory, and that patients with other forms of anaemia should be employed. Accordingly the present investigation was started as a study of folic acid excretion in various types of anaemia. At an early stage it was found (Girdwood, 1952b) that, of eight patients with iron deficiency anaemia, folic-acid excretion was diminished in four. All of these four suffered from carcinoma. It was decided, therefore, to investigate further the urinary folic-acid excretion in patients suffering from malignant disease and from various non-neoplastic conditions. About this time it was reported (Swendseid *et al.*, 1952) that folic-acid excretion was impaired in leukaemia. The patients in the present investigation were all given 5 mg. of folic acid subcutaneously.

Methods and Materials

The estimation of the urinary content of folic acid was carried out microbiologically. Under the conditions of the test the growth of *Streptococcus faecalis* in a suitable medium depends upon the amount of folic acid present in that medium. The growth of the test organism in tubes containing that medium and various dilutions of urine is compared with that in tubes containing the medium and dilutions of a standard solution of folic acid.

Estimations of folic acid were by the method of Teply and Elvehjem (1945), *Str. faecalis* R being used as the test organism. Estimations of citrovorum factor were by a modification of the method of Sauberlich and Baumann (1948) with *Leuconostoc citrovorum* as the test organism. In both instances turbidity readings were carried out in a Spekker photo-electric absorptiometer after incubation at 37° C. for 16 hours. The resting urinary content of folic acid is so small that no correction requires to be made for it in the folic-acid readings. The proportion of folic acid excreted as citrovorum factor is very small, as shown in the accompanying Tables, and the "folic acid" figures include any growth activity due to citrovorum factor. The citrovorum-factor readings have not been corrected for the resting urinary content of citrovorum factor, which on the average is of the order of 1 µg.

The folic acid was given by subcutaneous injection from a tuberculin syringe, and was taken from one or other of two batches of "folvite" that had been tested by us and found to contain 15 mg. of folic acid per ml. Several batches were rejected as they contained more than the stated amount. The volume injected was 0.33 ml.

Twenty-four-hour urine collections were put in brown bottles containing toluene and a phosphate buffer of pH 6.8. The greatest possible care was taken to ensure that the urines were total 24-hour specimens. The specimens were kept in a refrigerator at 4° C., and readings were usually

made within three days. All readings were at least in duplicate, usually triplicate. No antibiotics or sulphonamides were given to the patients during the period of the test.

Results

Folic-acid Excretion in Patients Not Suffering from Malignant Disease, Pernicious Anaemia, Intestinal Malabsorption, or Prolonged Infection

The results of the urinary excretion of folic acid in a number of patients with various non-malignant diseases are given in Table I. It will be seen that the only patient in whom the excretion was less than 30% of the dose administered (less than 1.5 mg.) was a man with severe congestive cardiac failure and oedema (Case 43). Two patients, one with a large pleural effusion and the other with massive ascites, are not included; in both instances folic-acid excretion was impaired, but it was possible to show that much of the vitamin was present in the effusion, and that urinary excretion took place over several days. These results suggest that in a patient with normal renal function and without oedema or a large effusion the 24-hour urinary excretion of a 5-mg. dose of folic acid should be greater than 1.5 mg.

It will be seen from Table I that anaemia in itself, even if severe, does not cause an abnormally low folic-acid excretion following a 5-mg. test dose. The same is true of hepatic cirrhosis.

TABLE I.—Folic-acid Excretion in Patients Without Evidence of Malignant Disease or Prolonged Infection

Case No.	Sex and Age	Diagnosis	Hb (g%)	R.B.C. (mill./c.mm.)	Urinary Folic-acid Excretion (mg./24 hrs.)	Urinary C.F. Excretion (μg./24 hrs.)
1	M 35	Normal	15.2	—	3.80	—
2	F 34	Agarucloctosis	11.0	5.11	3.75	—
3	M 30	Normal	15.4	—	3.56	—
4	F 34	Erythema nodosum (rheumatic); mitral stenosis	12.3	—	3.55	—
5	M 35	Bleeding duodenal ulcer	13.2	—	3.52	—
6	F 46	Portal cirrhosis; portal hypertension	10.0	3.15	3.41	5.10
7	F 48	Acquired haemolytic anaemia	10.3	3.53	3.32	3.7
8	M 42	Lobar pneumonia	14.8	5.16	3.30	9.6
9	M 77	Neurological features due to vitamin deficiency. Very strict vegetarian	12.3	4.22	3.20	0.83
10	F 32	Brachial neuritis	14.2	—	3.19	—
11	M 49	Bleeding duodenal ulcer	11.6	—	3.19	—
12	F 36	Iron-deficiency anaemia	3.8	2.60	3.16	10.8
13	M 63	Hypertensive cardiac failure	15.4	—	3.16	2.42
14	F 42	Iron-deficiency anaemia	8.1	4.21	3.04	—
15	F 43	"	7.1	4.98	3.02	4.10
16	F 45	"	8.6	4.18	2.96	1.55
17	F 49	Portal cirrhosis; portal hypertension	9.0	4.07	2.90	7.4
18	M 51	Gastric ulcer	15.2	—	2.89	—
19	F 34	Peptic ulcer; mitral stenosis	14.0	—	2.89	2.04
20	F 70	Coronary thrombosis; cardiac failure; pulmonary oedema; oesophageal hernia	11.2	5.5	2.80	—
21	F 17	Brachial neuritis	7.3	5.5	2.71	5.4
22	M 57	Polycythaemia	17.3	6.91	2.68	9.0
23	M 52	Gastric ulcer	15.3	—	2.66	—
24	F 66	Iron-deficiency anaemia	7.9	3.65	2.58	—
25	F 16	Thyroiditis	14.8	4.99	2.57	—
26	F 84	Aplastic anaemia	8.0	2.71	2.56	2.0
27	F 72	Portal cirrhosis	13.5	4.40	2.55	3.32
28	M 56	Bleeding duodenal ulcer	9.2	4.72	2.54	1.9
29	F 45	Portal cirrhosis	9.7	3.83	2.50	2.9
30	F 69	Myelocytosis	8.1	3.15	2.47	3.0
31	F 42	Iron-deficiency anaemia	5.6	4.64	2.42	2.1
32	F 36	Scleritis	11.9	—	2.31	—
33	M 42	Gastric ulcer	14.6	—	2.27	—
34	F 53	Para-oesophageal hernia	8.0	3.13	2.18	6.2
35	F 32	Dyspepsia	13.9	—	2.17	3.1
36	F 18	Brachial neuritis	12.5	—	2.05	—
37	F 48	Gastric neurosis	15.3	5.01	2.02	1.38
38	F 46	Iron-deficiency anaemia	8.1	4.67	1.93	7.36
39	F 42	Scleritis	14.2	—	1.73	—
40	F 66	Chronic alcoholic; bronchopneumonia; malnutrition	15.0	—	1.73	—
41	F 68	Malnutrition	9.3	3.6	1.52	1.47
42	F 84	"	4.0	3.1	1.52	2.8
43	M 66	Hypertensive cardiac failure with oedema	15.2	—	0.79	1.60

C.F. = Citrovorum factor

Folic-acid Excretion in Patients Suffering from Malignant Disease and Allied Conditions

In Table II there are given the urinary folic-acid excretion results in a number of persons suspected of having malignant disease (including leukaemia and the reticuloses) or found as a result of hospital investigation to be so afflicted. The Table is constructed so as to include the provisional diagnosis when the patient was first seen in connexion with the present investigation. Thus in many instances it was not known whether or not malignancy was present, and it will be seen that in some cases it was fortunately possible to show that no neoplastic disease existed. In the cases included in this Table the final diagnosis had been definitely established, in many instances by biopsy or laparotomy. Most of the patients included in Table II had had no therapy, but a few had been treated by x rays or other means several months before the present investigation.

It will be seen from Table II that a normal folic-acid excretion (1.5 mg. or less after the subcutaneous injection of 5 mg.) is of no help in excluding the presence of malignancy. Fourteen patients with carcinoma, leukaemia, lymphadenoma, or some other form of reticulosis had a normal folic-acid excretion. It is true that in most of these cases the general condition was good and there was little evidence of spread, but this was not so in Cases 53, 64, 66, and 73. Case 63 suffered from weakness and pyrexia, but no abnormality was found on physical examination. The diagnosis of lymphadenoma at the time of the folic-acid test was made only by exclusion and treatment with nitrogen mustard was begun. Despite the satisfactory folic-acid test, the diagnosis of lymphadenoma was confirmed at necropsy only three months later. Case 51 felt so well despite the abnormal blood picture that no treatment was given.

Inspection of the records of cases in Table II who excreted less than 1.5 mg. of folic acid shows that all of them suffered from malignant disease. In some instances the folic-acid-excretion results were available some time before the presence of malignancy was established by x-ray films, biopsy, or laparotomy. Obvious weight loss was not invariably present in patients with a positive test. It will be seen, too, that there was no correlation between the sedimentation rate or the degree of anaemia and the result of the folic-acid-excretion test in either malignant or non-malignant cases.

Folic-acid Excretion in Chronic Infection

There are occasions on which it would be helpful to have a test to determine whether a patient suffers from chronic infection or from malignancy. For this reason a separate table (Table III) has been constructed to include untreated patients with chronic infections and collagen diseases. In all the cases of pulmonary tuberculosis the disease was extensive, but except in Cases 106 and 115 the general condition under a sanatorium regime was good.

Case 118 illustrates most clearly that prolonged generalized bacterial infection can give a diminished output of folic acid after a test dose. No treatment had been given for a year.

In Case 115 the possibility that amyloid tissue has an affinity for folic acid would require consideration.

It is possible that the diagnosis in Case 117 was incorrect, as there was an increase in plasma cells in the marrow, and the symptoms and fever did not respond to salicylates.

Case 114 is of interest in that the patient's general condition was good, and the only obvious abnormality was splenic enlargement. Nevertheless the test was positive.

Four patients with pyrexia, the cause of which is not yet certain, are included to show that prolonged fever will not itself necessarily lead to a diminished excretion of folic acid. In this respect Case 99 is of interest in that quite high fever—rising to 103° F. (39.4° C.)—has been present intermittently for 18 months without evidence of general deterioration. The diagnosis of Case 108 is uncertain, but,

although emaciation was severe, folic-acid excretion was normal. Case 116 (lupus erythematosus disseminatus) was also much wasted, and, although cortisone therapy led to marked clinical improvement, the folic-acid excretion remained abnormal in this patient.

Folic-acid Excretion in Megaloblastic Anaemia

This is the subject of other communications (Girdwood, 1951, 1953), and hence the only information required here is a summary of the findings in 20 cases of untreated pernicious anaemia, 2 cases of intestinal malabsorption that had

TABLE II.—Folic-acid Excretion in Patients Suspected of Having Malignant Disease

Case No.	Sex and Age	Suspected Malignancy or Diagnosis on Admission	Hb (g%)	R.B.C. (mill./c.mm.)	E.S.R. (mm./hr.) (Westergren)	Final Diagnosis	Urinary Folic-acid Excretion (mg./24 hrs.)	Urinary C.F. Excretion (μg./24 hrs.)	Remarks
44	M 64	Gastric carcinoma (x-ray confirmation)	10.0	3.82	45	Gastric ulcer (non-malignant) at operation	4.05	—	Good general condition
45	F 48	Carcinomatosis	13.6	—	45	Carcinoma of cervix. No evidence of secondaries	3.7	—	
46	F 52	"	14.9	—	3	Brain-stem thrombosis	3.7	1.87	
47	F 50	Gastric carcinoma	12.2	5.26	50	Gastric ulcer (non-malignant) at operation	3.7	—	
48	F 51	Hepatic carcinoma	14.0	—	90	Rheumatoid arthritis	3.54	—	Good general condition
49	M 43	Lymphadenoma	16.0	5.31	—	Lymphadenitis	3.50	—	
50	F 43	Plasma-cell tumour of breast (biopsy before admission)	14.2	4.92	3	Plasma-cell tumour of breast	3.48	4.7	
51	M 66	Chronic lymphatic leukaemia	14.8	—	—	Chronic lymphatic leukaemia	3.46	10.3	Feels quite fit. No glandular, hepatic, or splenic enlargement. W.B.C. 112,800. No treatment given
52	M 60	Carcinoma of liver	14.0	—	38	Carcinoma of gall-bladder	3.33	2.47	
53	F 67	Bronchial carcinoma	6.0	4.3	90	Pulmonary tuberculosis; carcinomatous glands in neck; primary uncertain	3.19	5.5	
54	F 68	Carcinomatosis; myxoedema	10.0	2.89	112	Spondylitis; myxoedema	3.16	0.63	
55	F 44	Gastric carcinoma	11.5	5.5	8	Hiatus hernia	3.10	—	Weakness and raised E.S.R.
56	F 63	Suspected malignancy	11.8	4.08	110	Coronary thrombosis	3.06	—	Tiredness and weight loss
57	M 58	"	12.3	4.8	14	Anxiety state	3.02	—	
58	F 23	Lymphadenoma	13.6	—	24	Pulmonary and glandular tuberculosis	2.88	5.1	
59	F 70	Neck swelling; diabetes	15.6	5.62	5	Lymphosarcoma; diabetes	2.72	16.3	Liver and spleen not enlarged; good general condition
60	M 74	Carcinoma of gall-bladder	13.2	—	12	Gastric carcinoma: local spread to liver	2.6	3.1	Good general condition
61	M 45	Lymphadenoma	15.2	—	28	Lymphadenitis	2.6	8.47	
62	F 73	Bronchial carcinoma; rheumatoid arthritis	13.0	—	62	Bronchial carcinoma; rheumatoid arthritis	2.50	—	Slowly progressive over years
63	M 51	Lymphadenoma	8.7	3.21	127	Lymphadenoma	2.42	—	Pyrexia. No enlargement of glands or organs; died 3 months later
64	F 42	Acute lymphatic leukaemia	13.3	4.98	32	Acute lymphatic leukaemia	2.40	1.58	Enlarged liver, spleen, glands. Died soon after. W.B.C. 26,200
65	F 60	Suspected malignancy	14.1	—	48	No abnormality found	2.35	—	Weight loss; epigastric discomfort
66	M 56	Bronchial carcinoma	14.0	—	5	Bronchial carcinoma with metastases	2.27	3.5	
67	F 74	Carcinoma of caecum	—	—	—	Carcinoma of caecum (localized)	2.24	—	
68	F 50	Carcinoma of liver	12.3	—	—	Infective hepatitis	2.04	3.98	Serum bilirubin 13 mg./100 ml.
69	F 77	Carcinomatosis	8.8	2.47	70	Pelvic abscess	2.0	10.2	
70	F 46	Intestinal reticulosis	14.8	4.86	9	Intestinal reticulosis	1.97	4.4	Biopsy diagnosis. No evidence in other organs
71	F 56	Carcinoma small intestine	12.2	—	80	Adhesions	1.95	0.76	
72	M 63	Hepatic carcinoma	15.2	4.83	2	No abnormality found	1.90	2.70	
73	M 55	Aleukaemic lymphatic leukaemia	9.8	3.4	65	Aleukaemic lymphatic leukaemia	1.75	2.85	W.B.C. 5,000. Glands, liver, spleen normal. Died a month later
74	M 73	Glandular enlargement	11.0	4.3	100	Reticulosis	1.20	—	Very little weight loss
75	F 41	Pernicious anaemia refractory to vitamin B ₁₂	9.3	3.04	—	Pernicious anaemia; gastric carcinoma; metastases	1.16	—	
76	F 76	Iron-deficiency anaemia	6.2	3.03	47	Inoperable carcinoma of transverse colon	1.04	—	No weight loss
77	M 45	Lymphadenoma	8.6	—	125	Renal carcinoma	0.98	8.65	Normal renal function. No weight loss
78	M 71	Follicular reticulosis (biopsy diagnosis)	12.7	4.35	—	Follicular reticulosis	0.97	4.57	
79	F 62	Refractory iron-deficiency anaemia	5.4	2.9	50	Carcinoma of jejunum	0.796	4.61	
80	M 52	Glandular enlargement	14.9	4.98	—	Follicular reticulosis	0.762	—	No weight loss
81	M 49	Lymphadenoma	12.0	4.25	—	Lymphadenoma	0.75	3.6	
82	M 62	Iron-deficiency anaemia	4.6	2.97	6	Carcinoma of stomach and liver	0.71	—	
83	M 63	Same patient as Case 82 a year later	9.0	—	47	"	0.112	1.64	No clinical deterioration, but mass larger
84	M 32	Anaemia	7.6	2.31	—	Acute lymphatic leukaemia	0.715	3.5	Three weeks' illness
85	M 69	Jaundice	11.3	—	50	Carcinoma of liver	0.601	—	Serum bilirubin 120 mg./100 ml.
86	F 46	Uterine carcinoma; secondaries	3.5	1.67	125	Uterine carcinoma; secondaries	0.472	2.29	
87	M 48	Lymphadenoma	14.2	5.19	60	Lymphadenoma	0.46	12.8	
88	F 39	Pain in back—for investigation	9.0	3.1	125	Multiple myeloma	0.343	3.38	No weight loss
89	F 59	Chronic myeloid leukaemia	8.4	3.28	25	Chronic myeloid leukaemia	0.325	6.55	W.B.C. 384,000
90	F 22	Lymphadenoma	7.5	2.4	110	Lymphadenoma	0.221	—	Very little weight loss
91	M 34	Glandular enlargement	14.8	—	47	"	0.142	5.75	
92	F 32	Multiple myeloma	12.3	—	57	Multiple myeloma	0.134	2.91	
93	M 37	Multiple myeloma	8.5	3.08	—	Lymphadenoma	0.133	—	
94	F 32	Lymphadenoma	10.2	3.55	120	Lymphadenoma	0.100	8.4	
95	F 42	Emaciation	6.6	2.80	8	Carcinomatosis	0.084	3.35	No hepatic or glandular enlargement. Spleen just palpable. No weight loss
96	M 66	Chronic lymphatic leukaemia and cardiac failure	11.1	3.44	—	Chronic lymphatic leukaemia and cardiac failure	Negligible	Negligible	

TABLE III.—Folic-acid Excretion in Patients with Chronic Infections or Associated Conditions

Case No.	Sex and Age	Diagnosis	Hb (g.%)	R.B.C. (mil./c.mm.)	E.S.R. (mm./hr.)	Years of Illness	Urinary Folic-acid Excretion (mg./24 hrs.)	Urinary C.F. Excretion (μg./24 hrs.)	Remarks
97	F 27	Rheumatoid arthritis	8.6	—	60	6/12	4.23	—	
98	M 23	Pulmonary tuberculosis	—	—	5	6	3.49	—	
99	F 26	P.U.O.	12.5	4.88	5	1½	3.48	5.73	Extensive bilateral Temperature to 103° F. (39.4° C.), good general condition
100	M 37	Pulmonary tuberculosis	—	—	52	2	3.34	—	
101	F 23	P.U.O.	12.4	4.14	18	3/12	3.23	6.5	Bilateral Temperature to 99.5° F. (37.5° C.) Large cavity
102	M 47	Pulmonary tuberculosis	—	—	2	3	3.01	—	
103	F 52	Chronic bronchitis with acute recurrence	14.0	—	100	20	2.98	—	
104	M 62	Pulmonary tuberculosis	—	—	35	1½	2.62	—	
105	M 53	"	—	—	47	2	2.59	—	
106	M 67	"	14.2	—	26	Many	2.43	—	
107	F 21	Undulant fever	15.2	—	12	2/12	2.38	4.07	Extensive unilateral
108	F 43	P.U.O.	—	—	22	1½	2.38	11.2	
109	F 63	Rheumatoid arthritis	9.9	3.37	5	3	2.30	2.79	Lost 3 st. (19 kg.)
110	F 70	Severe chronic bronchitis with heart failure	13.0	4.5	40	Many	2.2	—	Much wasted
111	M 48	Pulmonary tuberculosis	—	—	40	1	2.14	—	
112	M 52	P.U.O.	13.4	5.82	130	4/12	1.79	—	Extensive bilateral Temperature to 101° F. (38.3° C.)
113	F 53	Chronic pneumonia with eosinophilia	11.0	3.86	74	1½	1.74	—	
114	M 46	Sarcoidosis	14.6	5.01	—	Recent	1.15	2.15	Splenic enlargement only. Diagnosis after splenectomy
115	F 45	Pulmonary tuberculosis amyloid liver	—	—	55	13	1.14	6.13	
116	F 50	Lupus erythematosus disseminatus	7.4	3.58	110	2	0.95	—	
117	F 50	Rheumatoid arthritis	14.8	—	35	2/12	0.825	—	
118	M 26	Subacute bacterial endocarditis (untreated)	11.0	3.63	76	1	0.14	—	Did not respond to salicylates

not received folic acid, vitamin B₁₂, or citrovorum factor, 7 cases of megaloblastic anaemia of pregnancy, and 1 case of idiopathic refractory megaloblastic anaemia.

TABLE IV.—Folic-acid Excretion in Megaloblastic Anaemia (Untreated)

	No. of Cases	Folic-acid Excretion (mg.) Following a 5-mg. Test Dose given Subcutaneously
Pernicious anaemia	20	0.066–3.08 (mean 1.55)
Intestinal malabsorption	2	0.126, 0.299
Pregnancy (megaloblasts, not transitional erythroblasts, present)	4	1.33, 1.50, 2.37, 2.64
Idiopathic refractory megaloblastic anaemia	3*	1.58, 1.75, 3.84
	1	1.92

* Received 15 mg. of folic acid by injection.

In all these patients the marrow was frankly megaloblastic: examples where transitional erythroblasts were found are recorded separately (Girdwood, 1953).

It will be noted from Table IV that in megaloblastic anaemia of pregnancy folic-acid excretion may be normal. Of the 20 pernicious-anaemia patients, 9 had an excretion of less than 1.5 mg.

Discussion

These results suggest that the folic-acid excretion test may have a limited place in the investigation of puzzling cases. Many more cases must be studied before we can say to what extent the test is of value in differentiating between such conditions as aplastic anaemia and aleukaemic leukaemia or simple iron-deficiency anaemia and iron-deficiency anaemia associated with advanced malignant disease. It is obvious that a "negative" test (normal excretion) is of no assistance to the clinician in the diagnosis of malignancy, since in 14 cases a normal excretion of folic acid was found. On the other hand, where there is no evidence of intestinal malabsorption, prolonged fever, megaloblastic anaemia, a large effusion or generalized oedema, and where renal function is not impaired, a "positive test" (an excretion of less than 30% of a 5-mg. test dose) would appear to suggest the presence of malignancy. Further investigations may show additional exceptions to this generalization. It is important that an exact dosage of folic acid should be given, and the urine collection must be complete. We have found that a

repetition of the test dose may give a less abnormal finding on the second occasion, possibly because the first 5 mg. of folic acid partially corrects the folic-acid deficiency in the tissues.

It is not certain what a diminished urinary excretion of folic acid indicates. In nutritional megaloblastic anaemia, and in untreated cases of intestinal malabsorption, the presence of megaloblasts in the marrow is taken to indicate deficiency of folic acid or of vitamin B₁₂. In untreated pernicious anaemia, in which the primary deficiency is believed to be of vitamin B₁₂, folic-acid excretion following a test dose is frequently low, but can be normal. Moreover, transitional erythroblasts rather than true megaloblasts may be found in association with either a normal or an abnormal output of folic acid. The excretion in megaloblastic anaemia of pregnancy may be normal or abnormal, and this is discussed elsewhere (Girdwood, 1953). In malignant disease the amount of the test dose of folic acid excreted may be much diminished, but megaloblasts are only very rarely found in the marrow. They were not seen in any of the cases reported here.

One possible explanation both of the absence of megaloblasts and of the low urinary excretion of folic acid would be that the tumour tissue competes with the host for folic acid or its derivatives, but not to the extent of depriving the red-cell precursors of enough folic acid for maturation along normoblastic lines. Such a possibility is understandable where there is widespread malignancy as in leukaemia (for example, Case 84, in which the illness had been of only three weeks' duration and there would hardly be time for any other mechanism to play a part). The occurrence of megaloblastosis cannot be related directly to the degree of impairment of urinary folic-acid excretion, since the mechanism of production of megaloblastic change in the marrow varies in different conditions. It is possible that where the primary fault is virtual absence of folic acid or associated substances from the diet, or malabsorption of the folic-acid group of vitamins, a greatly diminished urinary output of administered folic acid will be associated with megaloblastosis; but we have seen that where the primary fault is the absence of vitamin B₁₂, or where there seems to be mal-utilization of folic acid in the body (for example, pregnancy megaloblastic anaemia) this relationship does not necessarily hold.

THE PREVALENCE OF FOOT DEFECTS AMONG WARTIME RECRUITS

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Other modes of production of the apparent folic-acid deficiency in cases of malignant disease that merit consideration are deficient intake due to anorexia with resulting primary malnutrition, and diminished absorption produced by widespread metastases or some other means.

It seems unlikely that either of these mechanisms could operate without significant weight loss occurring, and there was little or no weight loss in Cases 74, 76, 77, 81, 84, 88, 90, 95, and 114. Moreover, in Cases 77 and 114 there was no evidence at operation of any cause for intestinal malabsorption. This was true also at post-mortem examination in Cases 88 and 95.

In contrast, there was very severe primary malnutrition of many years' duration in Cases 40, 41, and 42, as established by a detailed dietetic investigation. An important source of calories for Case 40 was whisky. Case 41 weighed only 4 st. 12 lb. (30.8 kg.): a fat-balance test in this patient revealed normal fat absorption. A post-mortem examination of Case 42 revealed no abnormality other than generalized wasting.

Nevertheless these patients, while excreting less of the administered folic acid than did most of the other control cases, were able to excrete 1.5 mg. or more.

It is, of course, possible that several factors operate to give a diminished folic-acid excretion in some patients with malignant disease. Thus it would be reasonable to assume that intestinal malabsorption was an important cause in Case 79. Recently a folic-acid-absorption test has been devised for measurement of absorption of folic acid from the alimentary tract (Girdwood, 1953), and it may be that the application of this test to cases similar to those in Table II will be of value.

The data given do not indicate whether the result of the folic-acid-excretion test is of help in assessing the prognosis or of value in considering the best method of treatment to adopt, especially in patients with leukaemia or some form of reticulosis. Case 63 had a normal folic-acid excretion and died within three months. Case 87 had a very abnormal excretion, but is alive and well following x-ray therapy.

Summary

A test dose of 5 mg. of folic acid was given subcutaneously to 148 patients. The urinary excretion of folic acid usually exceeds 30% of the test dose, and an excretion of less than 1.5 mg. is recorded as a "positive" test.

The test may be positive in megaloblastic anaemia, but there is no evidence that anaemia in itself gives a diminished excretion.

Where renal function is good and the patient does not suffer from megaloblastic anaemia, intestinal malabsorption, generalized oedema, a large effusion, or severe infection of long duration, a positive test is likely to indicate the presence of advanced malignant disease. It is, however, possible to have advanced malignancy with a negative folic-acid test.

This work was made possible by the kind co-operation of many physicians, surgeons, and nursing sisters in numerous hospitals in Edinburgh and district. I wish to thank them, Mr. Robert Brown, for performing many of the assays, and Professor L. S. P. Davidson for helpful advice. Financial assistance was obtained from the John Risk Bequest. Dr. A. T. Mennie, of Lederle Laboratories Div., Cyanamid Products Ltd., kindly supplied the folvite.

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There is a general, if unconfirmed, impression that foot defects are common, painful, and incapacitating enough to justify more attention than they have hitherto received from epidemiologists. A recent survey in Luton has indicated the number of persons who themselves complain of foot trouble (Dykes, Grundy, and Lee, 1952), but assessments of incidence based on clinical observations are mainly confined to children (Emslie, 1939; Wilkins, 1941), young women (Alford and Gorrie, 1952), and aged persons (Sheldon, 1948). In the present investigation the registers of Civilian Medical Boards, which are more fully described elsewhere (Martin, 1949; Clements and Pickett, 1952) have been used to obtain an estimate of the prevalence of foot defects in men of working age and, where possible, to identify predisposing factors.

The registers used in the present survey relate to men who were called up in 1941 and examined in Leicester. According to the official instructions circulated to the Medical Boards, "special attention should always be drawn to the defects which may cause a man to be classified in one of the lower grades of fitness for military service, or which may influence decision on possible claims for pension in the future: these should be described as in a clinical report." The instructions stress the importance of recording all types of foot defect and state that a detailed examination of the feet may be omitted only if a man is so severely disabled in other respects as to be totally unfit for military service. There were 358 such cases in the Leicester records. After the exclusion of these, and of a further 93 over 45 years of age, there remained 22,843 men between the ages of 17 and 44, of whom 3,287 (14.4%) shared 4,160 foot defects.

Age Distribution and Interrelation of Foot Defects

The distribution of foot defects by age and diagnosis is shown in Table I. The two categories of flat-foot distinguish cases in which the arch could be restored by standing on tip-toe (mobile, or A cases), and cases in which the

TABLE I.—Foot Defects Recorded at Specified Ages: Men Examined at Leicester in 1941

Defect	Cases per 1,000 Examinees Aged						Total No. of Cases
	17-19	20-24	25-29	30-34	35-39	40-44	
Of longitudinal arch:							
Flat-foot (A cases)	38.9	38.6	36.7	39.0	36.6	45.6	880
" (B " ")	8.5	11.6	20.4	24.6	34.8	38.2	502
Pes cavus	5.2	7.9	10.7	11.2	14.4	12.7	233
Of forefoot:							
Hammer-toe	20.5	32.5	44.1	48.4	61.9	67.1	1,003
Hallux valgus	13.9	15.1	26.0	33.5	40.0	46.9	640
" rigidus	2.3	1.8	7.4	7.3	8.4	6.0	126
Overlapping toes	12.0	12.7	17.2	21.1	22.7	20.1	405
Other:							
Callusities	5.0	5.5	10.7	21.1	25.8	26.2	356
Miscellaneous	0.8	0.5	0.9	1.0	0.4	0.0	15
No. of examinees	4,835	3,786	2,153	5,082	5,496	1,491	22,843

longitudinal arch had permanently disappeared (rigid, or B cases).^{*} The category "miscellaneous" includes deformed nails (5), extra toes (3), skin pedicles (2), webbed toes (1), and four undiagnosed cases.

According to Table I the A cases of flat-foot showed a fairly level age incidence, but the B cases increased steadily with age to become four times as common in the early forties as in the late teens. In theory this discrepancy can be accounted for in several ways, but the most likely explanation (which assumes that the A cases represent a stage between normality and total extinction of the longitudinal arch) is that new cases were occurring between the ages of 17 and 44 at roughly the same rate as established cases were progressing to an irreversible stage. If, however, the A and B cases of flat-foot are two distinct clinical entities then the figures in Table I can be explained only by assuming that (1) mobile as well as rigid flat-foot is an irreversible condition; (2) regularly throughout the age group 17 to 44 years new cases of rigid flat-foot continued to develop *de novo*; and (3) virtually all the cases of mobile flat-foot were manifested before the age of 17.

Table I also shows the incidence of metatarsal and related defects at various ages. The two most common conditions in this group show a rising age incidence, and by the early forties nearly 7% of men had hammer-toes, and nearly 5% had hallux valgus. A similar though less noticeable increase with age is seen in the case of callosities and overlapping toes, but the incidence of hallux rigidus shows little variation within the age range 17-44. There was also a distinct tendency for foot defects, especially when severe, to occur together. A measure of this tendency is shown in Table II.

TABLE II.—Frequency of Multiple Foot Defects

r	No. of Men with r Defects	Expected No. of Men with r Defects, on the Assumption that Defects Occur Independently
0	19,564	18,970
1	2,554	3,594
2	584	267
3	129	
4	11	12
More than 4	1	
All	22,843	22,843

which gives the actual number of men having 0, 1, 2, 3, 4, and more than 4 defects and the numbers to have been expected if each defect had occurred independently.

The expected figures were obtained by multiplying the appropriate proportions and summing when necessary. For example, the expected proportion with exactly one defect

was $\sum_i \left\{ \frac{p_i}{1 - p_i} \left[1 - (1 - p_i) \right] \right\}$ in which p_i stands for the

proportion of men with the i th defect. In this calculation both categories of flat-foot are, of course, treated as one defect, since by definition they cannot occur together.

It will be seen that isolated defects occurred with less than three-quarters, pairs of defects with over twice, and three or more defects with nearly twelve times their expected frequency. The following list shows the extent to which particular defects tended to be associated, the figure beside each defect being the ratio of the number of times it was found in conjunction with other defects to the expected number, in the sense defined above: callosities, 4.75; flat-foot (B cases), 3.59; hallux valgus, 3.54; hallux rigidus, 3.10; overlapping toes, 3.05; hammer-toe, 2.80; pes cavus, 2.76; flat-foot (A cases), 0.64. The position of callosities at

^{*}According to the official instructions, all A cases were automatically placed in the top fitness category (Medical Grade I) and B cases in Medical Grade IIa (feet), but in the presence of more disabling conditions the medical grade no longer serves to distinguish the two groups. These cases had to be "placed" at the time of coding and the convention was adopted that, in the absence of fuller clinical descriptions, all cases of "mild" or "slight" flat-foot should be coded A and all cases of "severe" or "disabling" flat-foot coded B.

the head of the list reminds us that these painful skin lesions are apt to accompany every variety of bony displacement. The list also shows that mobile flat-foot is rarely and rigid flat-foot commonly found in association with other deformities. This suggests that by the time other lesions have developed in flat-footed persons the longitudinal arch has usually disappeared.

The analysis of multiple defects was carried one stage further by calculating "association" ratios for specific pairings of defects. The two most frequent pairings were hammer-toe and callosities (121 times) and hallux valgus and hammer-toe (104 times), but for several other well-known combinations the excess relative to the "expected" number of cases was even greater. Thus hallux valgus and overlapping toes were eight times, hallux rigidus and flat-foot seven times, and pes cavus and hammer-toe four times, as common as they would have been if they were independent lesions.

The tendency for bony deformities of the foot to be found in association with diseases which affect other parts of the skeleton was also studied and foot defects were found to be especially common in persons who had had the paralytic form of poliomyelitis. There were also significant associations for lower limb injuries, curvature of the spine, rheumatoid arthritis, and for a mixed group of skeletal conditions mainly composed of operations on the lower limb and undiagnosed wasting of leg muscles.

Relation of Foot Defects to Body Size and Build

According to Lake (1943) the human foot is still imperfectly adapted to the extra strain imposed upon it by the upright posture. Since this strain is related to body build it was thought worth while to examine the association between overt foot defects and certain measurements recorded at the time of the medical board.

In Table III the number of men ($\times 100$) with foot defects who fall into eight weight groups has been compared with the number to have been expected if the risk of foot troubles were independent of weight. The corresponding analysis for height is shown in Table IV. In both tables the age distribution of the different groups has been taken into consideration. The numbers on which the ratios are based have also been subjected to a statistical test which measures the likelihood of obtaining so large a departure from expectation as a result of chance fluctuations only. The results of these χ^2 tests are shown in the right-hand column of the table.

For foot defects as a whole (bottom line of Table III) there was no perceptible association with body weight, but a few specific conditions revealed statistically significant departures from expectation. The most definite of these associations were the exceptionally high ratios for rigid flat-foot, pes cavus, and overlapping toes in men weighing less than 110 lb. (49.9 kg.). The findings for A cases of flat-foot were inconclusive, but the highest ratio was at the heavy end of the weight scale, whereas for B cases it was at the lowest end.

For all types of foot defect taken together the association with height was much stronger than that with weight, and there were also significant associations for several individual lesions (see Table IV). Once again, however, the findings were not straightforward. Thus, overlapping toes were less common among medium-sized men than among either tall or short men; both categories of flat-foot had a maximum incidence in short men, and all the metatarsal deformities gave high ratios at or near the top of the height scale. In the extreme case of hammer-toe the risk for men of 70 in. (178 cm.) or taller was over twice as great as for men of 64 in. (162.5 cm.) or shorter. There are no measurements of foot length in civilian medical board records, but Morant and Gilson (1945), who studied men in the Royal Air Force, found that the coefficients of correlation between foot length and height, and foot length and weight, were +0.700 and +0.557 respectively. This may account for the departures from level incidence associated with variations in height being greater than those associated with weight.

TABLE III.—Relation Between Body Weight and Incidence of Foot Defects. Standardized for Age (Standard Incidence=100)

Foot Defect	Weight (lb.)										Probability (P) that the Observed Departures from Standard Incidence could have Arisen by Chance
	< 100	< 110	< 120	< 130	< 140	< 150	< 160	< 170	< 190	190 +	
Flat-foot (A cases)	76		100	108	102	86	111	100	112		0.20 > P > 0.10
" (B ")	151		105	88	88	109	76	106	138		0.01 > P > 0.001
Pes cavus	160		96	85	123	87		80			0.05 > P > 0.02
Hammer-toe	89		91	98	105	105		133	84		0.30 > P > 0.20
Hallux valgus	118		107	104	95	97	100	89	77		0.80 > P > 0.70
" rigidus		120		114	89	69		101			0.50 > P > 0.30
Overlapping toes	143		115	104	102	176	86		82		0.10 > P > 0.05
Callosities		98		96	107	99	81		120		0.80 > P > 0.70
One or more of the above	110	104	103	99	99	95	98	110	105	102	1.00 > P > 0.90

TABLE IV.—Relation Between Standing Height and Incidence of Foot Defects. Standardized for Age (Standard Incidence=100)

Foot Defect	Height (in.)							Probability (P) that Observed Departures from Standard Incidence could have Arisen by Chance
	< 62	< 64	< 66	< 68	< 70	< 72	72 +	
Flat-foot (A cases) ..	145	110	102	102	88	102	92	0.20 > P > 0.10
" (B ") ..	123		103	93	96	98		0.50 > P > 0.30
Pes cavus ..	83		105	91	96	134		0.30 > P > 0.20
Hammer-toe ..	62		79	86	128	154	135	0.001 > P
Hallux valgus ..	97		89	99	101	112	148	0.20 > P > 0.10
" rigidus ..		106		98		96		0.90 > P > 0.80
Overlapping toes ..			96	86	97		130	0.10 > P > 0.05
Callosities ..			94	87	115		144	0.01 > P > 0.001
One or more of the above	106	96	94	95	102	118	121	0.01 > P > 0.001

Considering the close association between weight and height (the coefficient of correlation for the present set of records was +0.725) there were remarkably few examples of contrasts between light and heavy men appearing again as contrasts between short and tall men. On the other hand, there were several examples of the same risks for short men and heavy men—for example, flat-foot—and for tall men and light men—for example, hammer-toe. It is clear, therefore, that certain foot defects are as closely related to general build as to absolute size.

An attempt was made to measure the relationship between foot defects and body shape, but only three measurements were available for the purpose—namely, height, weight, and chest circumference.

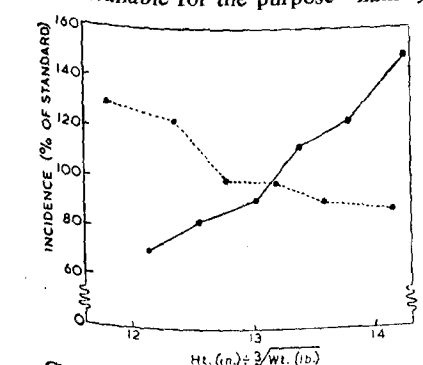


Chart showing relation between body shape and incidence of foot defects, standardized for age. (Standard incidence=100.) Probability that observed departures from standard incidence could have arisen by chance: Flat-foot (broken line), 0.01 > P > 0.001; forefoot defects (continuous line), P < 0.001.

root of the weight in pounds) has a minimum value for a perfectly spherical body, and increases with increasing linearity of build. In adult males the normal range of variation of this index is from 11½ to 14½. Since the index tends to fall with age, the incidence ratios plotted in the Chart have been standardized for age in the same way as the separate ratios for height and weight. The diagram traces the relationship between the body-build index and the incidence of two groups of foot defect—namely, tarsal (that is, both grades of flat-foot) and metatarsal (that is, hallux valgus, hallux rigidus, overlapping toes, and hammer-toe, either alone or in combination). The

figure shows that for stocky men, with low values of the body-build index, flat-foot occurred in excess. It is possible, therefore, that overweight, or some associated condition, predisposes to this type of foot defect. The incidence of metatarsal defects, however, rose continuously with increasing linearity of build, and the risk appeared to double within the observed range of the index. For these cases, therefore, it is more reasonable to look for causes associated with underweight or slender build.

Relation of Foot Ailments to Economic Circumstances and Occupation

According to the Foot Health Educational Bureau (1949) "Exact figures are hard to come by, but, though as yet we have no unselected random sample of foot conditions among adult groups in Great Britain, it is probably correct to say that ailments of the feet . . . are distributed irrespective of income level." From an analysis of the civilian medical board records, however, it appears that this statement is almost certainly incorrect (see Table V).

TABLE V.—Relation Between Social Class and Incidence of Foot Defects. Standardized for Age (Standard Incidence=100)

Foot Defect	Social Class (according to Registrar-Gen.)					Probability (P) that the Observed Departures from Standard Incidence could have Arisen by Chance
	I	II	III	IV	V	
Flat-foot (A cases)	70	104	110	94		0.02 > P > 0.01
" (B cases)	79	96	107	139		0.01 > P > 0.001
" (total)	73	101	109	111		0.01 > P > 0.001
Pes cavus	101	98	119			0.70 > P > 0.50
Hammer-toe	82	99	115	106		0.10 > P > 0.05
Hallux valgus	68	98	108	132		0.01 > P > 0.001
" rigidus	149	91	103			0.20 > P > 0.10
Overlapping toes	68	98	122	118		0.05 > P > 0.02
Callosities	74	96	110	139		0.05 > P > 0.02
One or more of the above	60	80	100	108	112	0.001 > P

The age-standardized ratios for all foot defects except hallux rigidus showed a marked social class gradient, with the highest incidence among unskilled and semi-skilled workers. But a separate analysis of the two varieties of flat-foot showed that it was only the B cases which tended to concentrate in the lower-income groups. A possible explanation of this difference is that economic factors are more potent to aggravate pre-existing conditions than to initiate new lesions.

The relatively level social class and age distributions of hallux rigidus are in marked contrast with the corresponding gradients for hallux valgus and rigid flat-foot. The contrast between hallux rigidus and hallux valgus corresponds to known differences between the aetiology of these two conditions, but that between hallux rigidus and rigid flat-foot is at first sight difficult to reconcile with the orthodox view that a flat-footed gait predisposes to osteoarthritis of the first metatarso-phalangeal joint. Provided, however, a majority of cases of hallux rigidus are due to causes other than flat-foot, there is no contradiction between the findings of the present investigation and accepted clinical opinion.

Table VI summarizes the results of an attempt to relate the risk of foot defects to strictly occupational influences, as distinct from risks associated with low economic status. Table VI abounds with examples of significant departures from standard incidence, but it is clear that many of these only reflect the earlier analysis by social class. There are, however, a few findings which cannot be accounted for on this score and suggest the possibility of more specific occupational influences. For instance, (1) shoe operatives had an exceptionally low incidence of hammer-toe but a high incidence of overlapping toes; (2) the group of lathe operators and testers had a high incidence of flat-foot and an unusually low incidence of hammer-toe; (3) transport workers had a high incidence of foot defects in general, and of flat-foot in particular; and (4) workers in farming and building had a large excess of pes cavus. With the data available it was not possible to explore these relationships further, but they offer promise that survey of footwear and "foot work" in selected industries would yield some interesting results.

Discussion

In the case of a disease, such as tuberculosis, which has been intensively studied from the statistical angle, even the minutiae of survey findings can usually be seen in their proper perspective. When, however, an epidemiologist attempts to use survey data for a study of foot defects he soon discovers that there is no ready-made context for his findings. The present study has resulted in a collection of miscellaneous facts which, like the pieces of a jigsaw puzzle, are tantalizingly rich in detail but lacking in general coherence. Nevertheless a start must be made some time, and, though the present investigation has left nothing fully proved, it does suggest some new lines of inquiry.

It is possible, for instance, that the variations in incidence of foot defects which have been found to be associated with variations in body build and social class reflect the fact that there is not, in this country, a wide enough range of shoe shapes and sizes to cope with the general need. Or that, if there is, the need remains unsatisfied because the public does not realize the dangers of ill-fitting shoes. This

theory rests on two basic assumptions. The first is that the relationship between foot shape and body shape is such that persons of stocky build have feet which are disproportionately broad, and persons of slender build have feet which are disproportionately narrow. If this is so, then the fact that stocky men have emerged as bad risks in respect of flat-foot, and slender men as bad risks in respect of pes cavus and metatarsal deformities, may be due to the former being forced to wear shoes which are too long for the necessary width and the latter shoes which are too short.

The second assumption, which is introduced to explain the contrasts between tall and short men, is that the feet of tall men grow faster (as well as longer) than the feet of short men. The argument runs as follows: parents of children whose feet grow exceptionally slowly or exceptionally fast tend to misjudge the time taken to outgrow a new pair of shoes. As a result the slow growers (who are destined to be short men) spend most of their youth in shoes which are too big, and the fast growers in shoes which are too small. Finally, the social class gradient is accounted for by supposing that cheap shoes do more harm than expensive shoes, and that working-class parents find it particularly difficult to keep pace with the needs of growing children.

This is a highly speculative theory, and it is doubtful whether it would ever be possible to test it at all points, even if it proved acceptable to orthopaedic specialists. It will, however, have served its purpose if it shows how valuable it would be to know more about the relationship of body build to foot shape and the relationship of shoe habits to foot defects.

Summary

In a sample of 22,843 men aged 17 to 44 who were examined at Leicester in 1941, it was found that:

1. There was an increase with age in the incidence of rigid flat-foot, hammer-toe, hallux valgus, callosities, overlapping toes, and pes cavus. Hallux rigidus and mobile flat-foot showed a relatively even age incidence.
2. There was a real tendency for foot defects to occur in association with one another and with certain other skeletal defects.
3. Tall men suffered more often than short men from metatarsal defects (hallux rigidus excepted), but flat-foot more commonly affected short than tall men.
4. The risk of metatarsal defects increased continuously with increasing "linearity" of body build (as measured by the index $Ht \div \sqrt{Wt}$). Flat-foot, on the other hand, was more common among men of stocky build.

TABLE VI.—Relation Between Occupation and Incidence of Foot Defects. Standardized for Age (Standard Incidence=100)

Occupational Group	Main Social Class Represented	One or More Defect of Any Kind	Longitudinal Arch				Forefoot				Callosities	
			Flat-foot			Pes Cavus	Hallux valgus	Hallux Rigidus	Hammer-toe	Overlapping Toes		
			All	A	B							
Professional and administrative ..	I and II	74§	68†	62†	77	E	76	} 115	83	D	D 63†	
Commerce and finance ..	I .. II	93	94	84	109	D†	78*		103	92	D*	
Clerks and typists ..	I .. II	79‡	65§	67†	D†	D	92	111	111	D		
Textile operatives ..	III	103	104	107	99	93	96	} 99	102	99	98	
Boot and shoe operatives ..	III	102	109	110	107	112	95		79†	125†	111	D
Engineers ..	III	100	97	113	60†	D	111	115	88			
Lathe operators, testers, etc. (undefined)	III	95	123†	129†	111	D	96	} 92	58†	D	D 134	
Warehousemen, packers ..	III	109	97	96	99	D	131*		130†	130†	D	
Transport workers ..	III	116†	123†	120	130	E	93	} 92	119	128	128	
"Other occupations" ..	IV	102	98	94	105	93	112		104	105	108	
Farming, building, etc. ..	V	111	115	124*	100	155†	98	97	111	110	110	
Unskilled ..	V	110	96	78*	128*	151†	132†	111	127	153‡	153‡	
Probability (P) that observed departures from standard incidence could have arisen by chance			P<0.001	P<0.001	0.01> P>0.001	0.10> P>0.05	0.10> P>0.05	0.20> P>0.10	0.70> P>0.50	0.01> P>0.001	0.20> P>0.10	0.02> P>0.01

Where the contribution to the sum of χ^2 for all occupations made by any individual occupation would have been significantly large in a test based on one degree of freedom this is indicated by means of: * P<0.10; † P<0.05; ‡ P<0.01; § P<0.001.

5. Men in the lower social classes suffered more often than others from foot defects. The erroneous impression (which pre-dates the National Health Service) that all social classes are equally affected may have been due to a tendency on the part of well-to-do persons to seek medical advice for minor ailments more often than members of the working classes.

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INCIDENCE, ORIGIN, AND PREVENTION OF CERTAIN FOOT DEFECTS*

BY

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As the public know well, and hospitals' and chiropodists' reports confirm, many otherwise healthy adults suffer from foot trouble. A preliminary investigation in schools in Ealing (Craigmile, 1950) showed that many of the causes of adult foot disability were already present in the older schoolchildren. As a result of this, a routine foot inspection was begun in all maintained schools in the area. Until recently (Dykes *et al.*, 1952) there was no published report of the foot health of a normal population, and a survey of a factory in the area was made to determine the extent and chief causes of foot trouble in a normal working population. The results of this survey are in many respects confirmatory of the report of this survey at Luton, although undertaken on a different population and by different methods.

It soon became apparent that many foot troubles, while not present in the infant, began early in life and were due to stresses and strains imposed on an otherwise normal foot by modern conditions. Many of these

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TABLE I.—Distribution and Type of Foot Defects among Factory Workers

Age Group (years)	Position at Work. No. of Persons					Type of Defect Found (Percentage)																	
	Standers		Sitters		Walkers	Mixed		Total	Past Trouble		Present Pain		Hallux Valgus	Bunions	Crooked Toes	Valgus Ankles	Callouses	Corns					
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F					
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F					
15-20	2	17	—	19	—	3	4	8	6	47	50	12.2	15	15.7	—	—	33.3	27	16.7	44	16	36.4	
20-30	9	28	—	16	—	5	20	13	29	62	37.7	23.1	11	18.1	22	40	45	33.2	10	33.2	17	50.6	
30-40	5	11	—	6	4	1	14	5	23	23	33.2	21.7	21.7	21.7	5	21.7	32	50.8	43	50.8	56	56.6	
40-50	3	23	2	15	5	4	26	25	36	67	20	49.4	24	38	12	24	43	50.7	31	50	51	60	
50-60	8	7	1	3	8	4	8	11	25	35	44	32	32	43.4	24	32	43.4	48	36	41	68	60	
60+	3	1	1	1	1	—	7	1	12	3	48	66.6	48	33.3	40	33.3	68	100	80	100	68	—	
Total	30	87	4	60	18	17	79	63	131	227	39.1	28.3	27	29.6	22.2	30	44	41.5	41	26.2	39.4		

mean angle of 28 degrees at the metatarso-phalangeal joint. Table II shows the preponderance of cases of bunions in which this angle is 30 degrees or more.

TABLE II.—Relationship of Bunions to the Angle of Deviation at the Metatarso-phalangeal Joint. The Figures are for Women Only

Age Group	No. of Cases of Hallux Valgus			
	Angle of 10-29 Degrees		Angle of 30-50 Degrees	
	No Bunion	Bunion Present	No Bunion	Bunion Present
15-39 years ..	50	4 (8%)	19	13 (68.4%)
40-65 " ..	46	13 (28.2%)	47	32 (68.0%)

Survey II: Schoolchildren

The area under review covers both closely populated and semirural districts. About half the total school population was examined and all types of school were represented. The same two observers saw the children, and particular attention was paid to conditions likely to be precursors of adult foot trouble. Advice and treatment were given, where necessary at special sessions, and proved a valuable method of health education.

The results of the inspection of the 12,765 children are summarized in Table III.

TABLE III.—Percentage of Certain Defects Found in Schoolchildren on Routine Foot Inspection

Age Group	No. of Children	Proximal Hallux Valgus	Varus 1st Metatarsal	Cramped Toes	Valgus Ankles	Pes Cavus	Verrucae	Tinea	Unsatisfactory Footwear	Treatment Required	
										Chiropody	Minor Ailment Clinic
Infants, 5-7 years	Boys, 1,379 Girls, 1,364	4.3 4.7	12.2 12.95	12.0 13.7	7.4 4.5	0.2 0	0.3 0.3	0 0	17.1	0.4	3.0
Juniors, 8-11 years	Boys, 2,654 Girls, 2,700	6.1 11.7	10.7 12.6	11.9 18.2	6.4 4.8	0.13 0	0.8 0.75	0.2 0.2	22.7	1.0	4.0
Seniors, 12-15 or 16 years	Boys, 2,898 Girls, 1,770	4.0 22.4	8.7 8.0	14.5 24.1	3.9 5.15	0.44 0.02	1.7 3.2	0.3 0.2	21.5 35.0	1.7 4.0	3.0 7.0

Hallux Valgus

This deformity is of two distinct types. The distal or interphalangeal type does not give rise to pain in adult life, and, while it appears to be congenital in some children, occurs with generalized cramping in association with short footwear (see Table IV). The proximal type is an important cause of pain in adult life, occurring most often in

TABLE IV.—Percentage of Cases of Proximal and Distal Hallux Valgus in Boys and Girls in Relation to Age and Suitability of Shoes Worn

Age Group	Good Shoes			Bad Shoes		
	No. of Children	Proximal Hallux Valgus %	Distal Hallux Valgus %	No. of Children	Proximal Hallux Valgus %	Distal Hallux Valgus %
Boys						
Infants, 5-7 years	378	0.25	4.64	69	0.4	16
Juniors, 8-11 "	619	0.17	4.04	171	0.72	14.7
Seniors, 12-15 "	978	1.9	5.72	268	4.4	12.2
Girls						
Infants, 5-7 "	346	0.29	5.49	81	1.25	25.0
Juniors, 8-11 "	661	1.21	8.47	205	2.5	27.5
Seniors, 12-15 "	891	2.70	5.95	381	14.2	47.9

TABLE V.—Percentage of Cases of Proximal Hallux Valgus Found, and the Angle of Deflection, at Different Ages

Age Group	% of Proximal Hallux Valgus	Mean Deviation of Hallux	Range of Deviation
Infants, 5-7 years	0.1	5.0 degrees	3-18 degrees
Juniors, 8-11 "	2.0	8.5 "	5-16 "
Senior boys, 12-15 years	2.4	10.7 "	5-28 "
Senior girls, 12-15 "	8.7	16.5 "	7-35 "

women. In schoolchildren this end-result can be seen in process of development (see Table V). A comparison of junior and senior children shows that three times as many girls had hallux valgus and with a greater mean angle of deflection. This implies that factors which result in many women suffering from bunions start to operate in the middle years of childhood and become fully active before the union of the metatarsal epiphyses.

In an attempt to assess the causes of this deformity various possibilities were considered: the intrinsic action of a short or a varus first metatarsal bone, or a pronated forefoot, and the action of extrinsic factors.

A short first metatarsal bone occurred in 39.4% of children and showed no age or sex differentiation; its presence was not closely related to hallux valgus. The intermetatarsal angle decreases with age (Keith, 1931) but a wider angle appears more common in females (Hardy and Clapham, 1952). Children with this variation from normal have difficulty in finding shoes broad enough for their feet, and, in order to eliminate this extrinsic factor, the combination of metatarsus primus varus and hallux valgus in children who wore good shoes was examined. These figures (Table VI) show no significant correlation. In other words, this suggests that metatarsus primus varus is not in itself an exciting cause of hallux valgus. It may, however, be a predisposing cause.

The pronated forefoot appears to be related to hallux valgus of both proximal and distal types. In children who wore good shoes the probability of association was 0.01, and therefore unlikely to have arisen by chance.

There is an increase in the number of children wearing badly fitting shoes with age, the senior girls being far the worst group. A study of Table IV shows that there is a great increase in both types of hallux valgus with bad footwear. This increases with age, and is maximal among senior girls. Examination of the shoes showed two patterns which appeared particularly detrimental: the first type had sharply pointed toes, and the second was the "flatie" or "casual," which gives no support to the instep and therefore increases any tendency to pronation as well as cramping the toes.

TABLE VI.—Relationship Between Metatarsus Primus Varus and Hallux Valgus in Children Wearing Good Shoes

Sex	No. Examined	No. of Cases Metatarsus Primus Varus Alone	No. of Cases Hallux Valgus Alone	No. of Cases Combined Defect	χ^2	Probability
Boys	1,875	445	85	34	0.611	0.80 (Not significant)
Girls	1,962	411	122	49	0.518	0.90 (Not significant)

Deformed Toes and Flat Foot

Hammer-toes and mallet-toes showed a constant percentage of 1.7 for all ages. While about 99% of the children over 10 years of age have some twisting of the fifth toe, this was symptomless in many cases. Cramping of all toes associated with signs of pressure was found in about 10% of the children and was closely associated with tight shoes.

Of the main types of flat-foot, the stable low-arched foot was very common and, as in the adult, it was symptomless. Pronation of the forefoot is, however, important as a potential cause of future pain. It is very common in the pre-school group, but only about 5% of cases persist into school life. Pronated forefeet are also closely associated with hallux valgus.

Pes Cavus

Pes cavus may be congenital or acquired, and of the latter type, as well as those secondary to neuromuscular causes, there are many idiopathic cases. These latter are of interest in that they, alone of all structural foot defects, are more common in boys than in girls. This pes cavus was not related to heel-height, but was associated with short shoes. (B.B.S.A.T.R.A. Research Report No. 107).

Survey III: Ealing Contributory Shoe Scheme

This scheme was open to all children attending one welfare centre and one school in the area. It was designed to be financially self-supporting. For a lump sum, payable in instalments before entry, the child was able to obtain three pairs of walking-shoes and one pair of sandals each year. Careful medical supervision of the feet was undertaken at intervals of ten weeks throughout the year, and a general physical examination was made on entry to the scheme.

The scheme was made possible by the co-operation and interest of Messrs. James Southall & Co., who supplied the shoes, and of their two agents in the area.

At the first examination it was decided whether the standard shoes should be worn or if any modifications were required; this was noted on the voucher with which the shoes were purchased. In special cases joint consultations were made with the shop managers or the technical adviser to Messrs. Southall. Assistants who had special training in children's fittings supplied the shoes from a full range of four fittings to each half-size.

The scheme ran for two years, fresh entrants being accepted for the second year, and 164 children were studied (Table VII). The information obtained may be divided into non-medical data and facts of more direct medical value. As had been estimated, three pairs of strong shoes were just enough for the needs of most children. The amount of repairs varied widely, and rubber composition appeared to be the most hard-wearing material. A

TABLE VII.—Number of Children who Joined the Shoe Scheme, the Cost of the Scheme, and the Annual Expenditure on Shoes of a Sample of Children in the Borough, in the Previous Year

Age in Years	No. of Children	Annual Cost of Scheme	Yearly Expenditure of "Average" Child
2-4	88	£2 17s. 0d.	£2 18s. 0d.
5-7	36	£4 17s. 0d.	£4 3s. 0d.
8-10	32	£5 9s. 6d.	£5 11s. 0d.
11-15	8	£6 10s. 0d.	£6 14s. 0d.
Average	164	£4 18s. 4½d.	£4 16s. 6d.

TABLE VIII.—Number and Kind of Defects Found in the Feet of Shoe-scheme Children

Defect	No. of Cases		
	At Start	After 6 Months	After 1 Year
Hallux valgus	31	26	12
Cramped toes	46	20	8
Metatarsus varus	30	23	13
Pronated forefoot	29	17	16
Corns and callouses	30	8	3
Out-toeing	18	5	3
In-toeing	8	2	—
Knock-knees	21	7	3
Verrucae	6	—	—
Other (blisters, chilblains, etc.)	31	9	11
Total	250	117	69

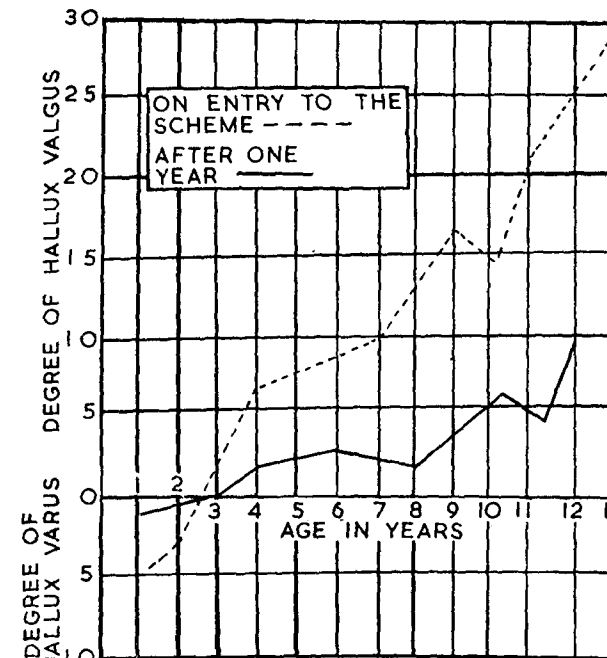


FIG. 1.—Graph showing the average angulation of the great toe at the metatarso-phalangeal joint at various ages.

record of the fittings required showed that at least three fittings to each half-size were necessary to obtain an accurate fit.

Pedograph Records.—A pedograph was made on entry to the scheme and after one year; it proved a useful measure for demonstrating decreasing pronation of the forefoot and the redistribution of weight in the foot.

Defects and Deformities

Table VIII shows the decrease in number of defects during one year and illustrates the rapid decline in foot troubles when expert advice is available. Certain conditions showed a spontaneous recovery without treatment other than well-fitting shoes and socks. The younger the

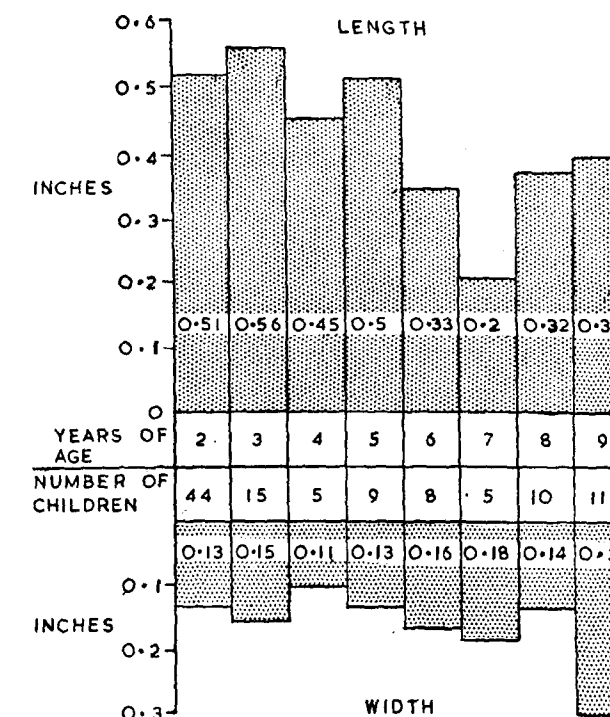


FIG. 2.—Histogram showing the mean annual increase in length and width of the foot for each year of age.

child the quicker was the return to normal. These defects were corns, callosities, cramped toes, and proximal hallux valgus. The angle of the hallux was studied, and 48 children showed a deviation of more than 2 degrees in either direction. There was a marked decrease in the angles of deviation after one year (see Fig. 1).

Growth Rates

Measurements were made of the rate and periodicity of growth, and the results in 107 children who attended regularly for at least one year are shown in Fig. 2. The rate

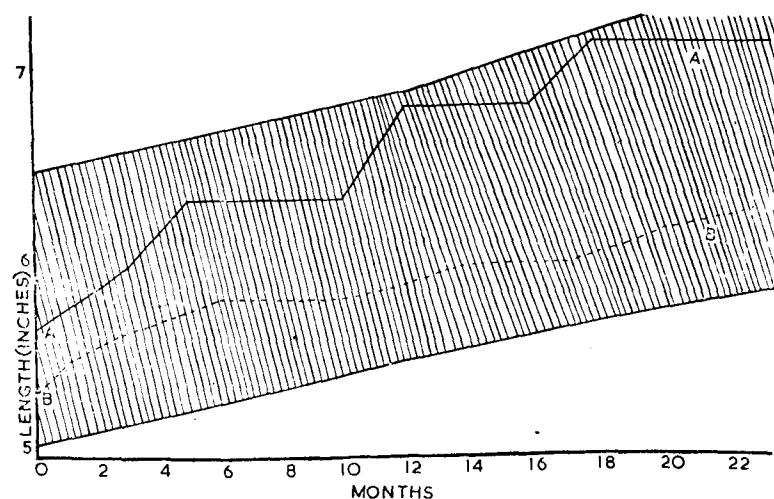


FIG. 3.—Graph showing two types of growth in length of children's feet. The shaded background shows the range of measurements found in the shoe-scheme children of the same age.

in girls and boys was fairly close, the average increase in length being just under $\frac{1}{2}$ in. (1.3 cm.) a year; this corresponds to one whole size in shoes. The periodicity of growth is interesting, and Fig. 3 shows the types which occur. The commonest type was a curve showing alternating periods of growth and quiescence. This may be an annual or a biannual spurt. Child A shows both types over the two years; a regular slow growth, illustrated by Child B, was less common. The period of the year at which most growth occurred was the summer (June–August), while the autumn (September–November) was the usual quiescent period.

Discussion of the Three Surveys

Many adults suffer from pain in their feet. This is borne out by the demand for chiropody treatment in private practice and by the first survey on adult factory workers. Such discomfort must have an appreciable effect on the general health, temper, and work of the sufferer, while the final result on the country's economics is an interesting imponderable. This survey also suggests that the principal causes of pain are hallux valgus and bunions, pain in the long and transverse arches, and corns. The first-named occurs chiefly in women.

The results of the school survey show that these defects begin to develop during the years of childhood and increase progressively with age. While no single cause for the predominance of hallux valgus in girls is apparent, the figures shown suggest that both valgus ankles and bad footwear, which are more common in girls than in boys, play a part in producing this deformity, but the preponderance of valgus ankles is not in itself sufficient to account for the greater number of cases of hallux valgus in girls. That idiopathic clawed foot is more common in boys than in girls is probably related to the predominance of metatarsalgia in men. One theory of development may be suggested: that the rounder shape of a boy's shoe, when short, exerts equal pressure on all toes, causing retraction and dorsiflexion, while a girl's more pointed shoe presses mainly on the fifth and first toes.

The experimental contributory shoe scheme has shown that it is both possible and practicable to run such a scheme for supervising the care of children's feet and, by so doing, to diminish the amount of foot trouble in children. While its inherent principles are sound, the scheme has certain disadvantages. First, that while prices are unstable it may be impossible for manufacturers to budget accurately for a year ahead; secondly, it is a pity to limit the scheme to one firm only; and, thirdly, comparatively few parents have taken advantage of it, as many felt that the prices were beyond their reach. This assumption was not entirely reasonable, for the prices in the scheme compared very closely with the average amount spent on footwear in the preceding year in the same district (Mayers, 1950). Nevertheless a modification of this scheme suggests a line of approach to the problem of the great number of painful and defective feet in the adult population.

Conclusions

A survey to study the main causes of foot trouble in the adult suggests that bunions and hallux valgus, metatarsalgia, long-arch pain, and corns are the chief types of foot disability in healthy adults. An examination of schoolchildren has shown that these defects begin in the later years of childhood. An attempt to maintain foot health by providing children with good footwear and by supervising their feet during the growing period showed that it is possible to prevent deformities and that certain early defects will correct spontaneously, given freedom for normal growth.

It is my pleasure to thank the Health Department of Middlesex County Council for facilities to carry out this research; in particular, Dr. W. G. Booth, area medical officer, Area 7, Middlesex County Council, to whom the Ealing Contributory Shoe Scheme owes its origin; also the British Boot, Shoe, and Allied Trades Research Association for loan of instruments; the Managing Director and Technical Adviser of "start-rite" shoes; to Mrs. Murton, S.R.N., for help in examination of the subjects.

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"It is regrettable that the position in relation to the institutional care of mental defectives has steadily worsened over the past four years. There is now a waiting-list of more than 420 patients for admission to institutions, as compared with 170 in 1948. The county council provides domiciliary supervision for all mental defectives in the county, and there are eight occupation centres where defectives may go daily for training and occupation, but this is no adequate substitute for institutional accommodation in many cases. There are numerous households where the defective child or adolescent is an intolerable burden and where only segregation in an institution will meet the case. The need for additional institutional beds for such patients is most urgent and should have a high priority in planning the use of available resources in manpower and money."—From the Report for 1952 of the Essex County Medical Officer of Health, Dr. H. K. Cowan.

THE 17-HYDROXYCORTICOSTERONE CONTENT OF HUMAN ASCITIC FLUID

BY

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In spite of many investigations uncertainty still exists about the quantity of adrenal cortical hormone present in human blood and other human body fluids. Most work in this field has been done on animals, and particular attention has been paid to the blood leaving the adrenal gland by the adrenal vein, since the highest concentrations of adrenal hormones may be expected in such blood. Both chemical and biological methods of assay have been applied, but neither has been entirely satisfactory, since chemical methods have not in general been sufficiently specific, and the biological methods have not been sensitive enough to respond to the very small quantities of active hormone present in circulating blood.

The Literature

One of the earliest estimates was that of Hemphill and Reiss (1947), who used a chemical extraction of blood and subsequent estimation of the reducing power of the steroid fraction. They worked mainly on rats, but found 0.21 to 0.43 mg. per 100 ml. in human blood. This early estimate must now be regarded as much too high.

Paschkis, Cantarow, and Boyle (1949) reported the detection of small amounts of adrenal hormone in arterial plasma of the dog. They used the method of glycogen deposition in the liver of the adrenalectomized mouse which had been developed by Venning, Kazmin, and Bell (1946). In the following year Paschkis, Cantarow, Walkling, and Boyle (1950) reported finding values of 14 to 50 μ g. per ml. of dog adrenal-vein blood, the activity being expressed in terms of 11-hydroxycorticosterone (compound A) acetate. They could also demonstrate biological activity in the peripheral blood of the dog.

In 1950 also, Nelson, Reich, and Samuels succeeded in isolating and identifying compound F of Kendall (17-hydroxycorticosterone; hydrocortisone) in the blood of the adrenal vein. Brownell, Hartman, and Liu (1951), who used the Venning glycogen deposition method, reported finding biological activity in dog adrenal-vein blood, but they were unable to detect any activity in the peripheral blood. Thus the earlier work of Paschkis and his colleagues on peripheral blood was not confirmed.

The relatively higher concentrations of hormone in adrenal-vein blood enabled more rapid progress to be made than was possible with peripheral blood, and Pincus, Hechter, and Zaffaroni (1951) were able to extract adrenal steroids from dog adrenal-vein blood in amount sufficient to allow of analysis by paper chromatography. In the dog the steroids identified were mainly 17-hydroxycorticosterone and corticosterone. The concentration of these after adrenal stimulation by A.C.T.H. rose as high as 55 μ g. of each per 100 ml. Cortisone was present in a concentration less than 10 μ g. per 100 ml., and was regarded as a metabolite, 17-hydroxycorticosterone and corticosterone being the main products.

Following up their identification of 17-hydroxycorticosterone in dog adrenal-vein blood, Nelson, Samuels, and Reich (1951) developed a chemical method based on the purification of the extracted adrenal steroids on a chromatographic column and subsequent measurement of the eluted adrenal steroids by means of a colour reaction with phenyl-

hydrazine and sulphuric acid. This colour reaction had been developed by Porter and Silber (1950) and had been shown by them to be specific for steroids having a 17-21-dihydroxy, 20-keto grouping. Both cortisone and 17-hydroxycorticosterone give the typical reaction, but it is given only weakly by corticosterone. Compounds giving this reaction are often called 17-hydroxycorticosteroids. The reaction cannot be regarded as entirely specific for active hormones, since some other products of adrenal steroid metabolism, notably tetrahydrocortisone, also give a strong reaction with the reagent but are biologically inert. Using the reaction on a micro-scale, Nelson and Samuels (1952), and Nelson, Willardson, Tyler, and Samuels (1951) found 4 to 6 μ g. of 17-hydroxycorticosteroid per 100 ml. of human venous blood and 9 to 11 μ g. in human arterial blood. Both figures rose after A.C.T.H. While some of this was probably 17-hydroxycorticosterone an unknown proportion may have been tetrahydrocortisone. This latter metabolite presumably occurs in blood, since it is present in large amount in urine, and has been identified in a peritoneal dialysate by Savard, Kolff, and Corcoran (1952).

Complication rather than simplification has ensued more recently. Thus Bush (1953) showed that the adrenal steroids differed in nature in different species of animal, some having much 17-hydroxycorticosterone and little corticosterone, and other species more of the latter than the former. Sweat and Farrell (1952), using a microchromatographic technique and subsequent detection of the steroids by fluorescence, developed a method sensitive to 0.25 μ g. They found 4 to 8 μ g. of adrenal steroid in the adrenal-vein plasma of stressed rats, but were unable to find any in peripheral blood of adrenalectomized rats. In the adrenal-vein plasma of dogs under stress they found 3 μ g. of a steroid resembling 17-hydroxycorticosterone and 1 μ g. of a corticosterone-like steroid.

At the same time Pincus, Romanoff, and Romanoff (1953) were producing data indicating the complexity of the problems involved in this and allied aspects of adrenal metabolism, for they were able to detect 35 different neutral lipoids in hydrolysed human urine, and similar compounds were found in human peripheral blood. Among the most important of these were corticosterone (compound B), 17-hydroxycorticosterone, cortisone, pregnane 3-11-17-21 tetrol 20-one, and pregnane 3-17-21 triol 11-20 dione (tetrahydrocortisone).

Zaffaroni and Burton (1953) have analysed a large volume of dog adrenal-vein blood from an animal stimulated by A.C.T.H. They found 130 μ g. of 17-dehydroxycorticosterone and 95 μ g. of corticosterone per 100 ml. of blood. Only traces of other compounds were found, but the method they used would not have detected some of the important inert metabolites such as tetrahydrocortisone.

The present position may therefore be summarized as follows.

Both corticosterone and 17-hydroxycorticosterone are present in appreciable quantity in adrenal-vein blood of experimental animals. Cortisone is not usually found. The most refined chemical methods indicate the normal presence of 4 to 6 μ g. of 17-hydroxycorticosteroid in 100 ml. of peripheral venous blood and 9 to 11 μ g. per 100 ml. of arterial blood. A considerable part of this seems to be 17-hydroxycorticosterone, but an uncertain fraction is metabolites which give the same colour reaction but are biologically inert—for example, tetrahydrocortisone. Biological assay indicates the presence of some active adrenal steroid in dog adrenal-vein blood, but no certain activity has been established in peripheral blood in either animals or man.

It seemed to us that useful light might be thrown on the problem by analysis of human ascitic fluid. Although ascitic fluid is not a normal body product it can be obtained in relatively large quantities, sufficient to make a biological assay feasible if the content in active hormones is 1.5 μ g. or more per 100 ml. We have found activity in excess of this figure in five out of ten ascitic fluid samples tested.

Methods

Samples of ascitic fluid have been obtained from suitable patients in volumes of 3 to 7 litres. These samples were extracted and the steroids concentrated into a volume small enough for injection into mice by a method employed by Bush (1952) for blood. The ascitic fluid was extracted by shaking four times with separate lots of chloroform, each representing 15% of the volume of the sample. The four extracts were combined and evaporated under reduced pressure at a temperature below 50° C. to small volume. To the residue of 5 to 10 ml. was added 200 to 400 ml. of acetone and a few drops of saturated magnesium chloride. The mixture was cooled overnight in the refrigerator. After filtration the acetone solution was distilled down to a small volume (3 to 5 ml.). This residue was taken up into 100 ml. of 70% aqueous ethanol and washed three times with 10-ml. portions of light petroleum to remove excess fats. The ethanol solution was evaporated under reduced pressure to dryness, dissolved in a small volume of chloroform, and transferred to a small tube in which it was evaporated to dryness by a stream of nitrogen to await injection.

For bio-assay the method described by Cope, Boysen, and McCrae (1951) has been used. This method makes use of the fact that cortisone-like hormones lower the number of eosinophil cells in the blood of adrenalectomized mice. An extract equivalent to 1,500 ml. of ascitic fluid was injected subcutaneously into each adrenalectomized mouse. For injection the extract was dissolved in propylene glycol, using 0.1 ml. for each 1,500 ml. of ascitic fluid represented. Four volumes of saline were then added, so that the final volume was such that each mouse received a 0.5-ml. injection of this 20% propylene glycol solution.

The eosinophil cell drop in the injected adrenalectomized mice was measured at four and six hours, the greater drop being taken as the significant one. The equivalent activity of cortisone was read off from a calibration curve prepared by injecting cortisone acetate in similar and constant volume of 20% propylene glycol, but in varying dosage into adrenalectomized mice.

Results

The results obtained with these extracts are summarized in the accompanying Table. Ten samples of human ascitic fluid have been separately extracted and tested, most of

Patient	Disease	Vol. per Mouse (ml.)	No. of Mice	Toxicity	Mean Drop Eosinophils	Equivalent Cortisone Content (µg. per 100 ml.)
1 Fr	Cirrhosis	1,500	3	++	No drop	Nil
2 Fr	"	1,500	3	+	"77"	4.4
3 Re	"	1,700	2	+	"77"	4.4
4 Pe	Carcinoma of peritoneum	1,600	3	++	62%	3.1
5 Pe	"	1,500	2	+	11%	<1.5
6 Du	Tricuspid incompetence	1,560	2	0	68%	3.8
7 Du	"	1,500	3	0	77%	5.0
8 Ha	Cirrhosis	1,560	3	0	74%	4.5
9 Du	Tricuspid incompetence	1,500	2	+	15%	<1.5
10 Du	"	1,500	3	+	20%	<1.5

+ toxicity = Well-marked sedation without loss of consciousness. ++ toxicity = A light coma from which the animals recovered in a few hours.

these being of sufficient volume to provide material for three mice. Five of these extracts showed unequivocal evidence of eosinopenic activity. Two extracts, both from the same patient, showed no trace of biological activity, and in the remaining three the presence of activity was equivocal.

Some of these extracts were rather toxic to the mice, producing lethargy and sometimes light narcosis. This effect was at first thought to be due to traces of the magnesium chloride used in the preparation of the extract being carried into the final residue, but efforts to remove this magnesium did not remove the toxicity. There was no relation between this toxicity and the magnitude of the eosinopenic response. Long-acting anaesthetics such as pentobarbitone sodium do not influence the eosinophil response to cortisone in the

adrenalectomized mouse. The degree of toxicity of the extracts is indicated in the Table.

It will be noted that although both ascitic fluid samples obtained from patient Fr were completely devoid of activity, yet in patients Pe and Du eosinopenic activity varied in samples of ascitic fluid removed from the same patient at different times. No explanation can be offered for this apparent variation, since the method of making the extracts was the same in all.

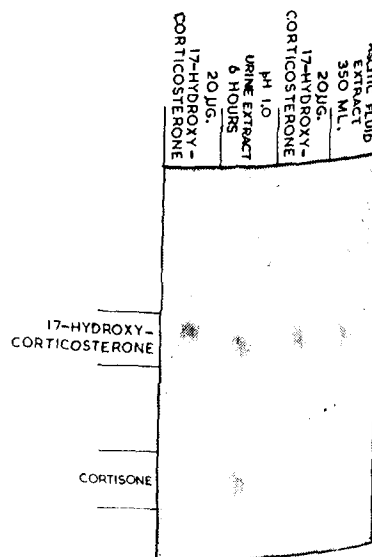
Discussion

The data obtained indicate that, although the amount of biologically active adrenal hormone extractable from human ascitic fluid appears to be variable, it does not usually exceed 5 µg. per 100 ml. In half the extracts examined it was much less than this, being below the level necessary for reliable detection by the methods used. Our previous experience with this bio-assay technique indicates that the variations in activity observed are much greater than could be due to errors in the method of assay.

Some information has been obtained on the nature of the hormone responsible for this biological activity. Extensive search by many investigators has failed to reveal any hormones other than cortisone and 17-hydroxycorticosterone, which lower the eosinophil count in the blood of adrenalectomized mice. Portions of four of the ascitic fluid extracts used in the present study have been submitted to analysis by paper chromatography, using the solvent systems developed by Burton, Zaffaroni, and Keutmann (1951). Whereas a substance behaving like 17-hydroxycorticosterone could be demonstrated in all of the extracts examined, cortisone was usually absent completely. It was indeed detected only in faint trace in a single extract. Urine, in contrast, usually contains both 17-hydroxycorticosterone and cortisone. Actual paper chromatograms of both urine and ascitic fluid extracts are compared in the accompanying illustration. The 17-hydroxycorticosterone found in these extracts was identified by the following points: (1) Its rate of flow in the chromatogram was identical with that of an authentic sample of free 17-hydroxycorticosterone. (2) It reduced the blue tetrazolium reagent like the authentic compound. (3) It absorbed ultra-violet light at 240 mµ. (4) The compound behaving identically with this which is present in urine has been injected into mice and shown to have strong eosinopenic activity.

Sufficient of one extract (No. 10) was available to permit a chemical estimate of the quantity of 17-hydroxycorticosterone present by measurement of the amount of tetrazolium reagent reduced at the appropriate point on the chromatogram. The estimate of 1.8 µg. per 100 ml. agrees well with the traces of activity found in the biological test, for larger quantities in the extract would have given an unequivocal biological response.

As corticosterone itself has been identified in the blood of many mammals, it is possible that this compound also is present in human ascitic fluid. No search for this substance was made in the present work, because no sample of



Comparison of paper chromatograms of both urine and ascitic fluid extracts.

PIPERAZINE IN THE TREATMENT OF
THREADWORMS IN CHILDREN

REPORT ON A CLINICAL TRIAL

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authentic corticosterone was available for comparison. Corticosterone, however, is reported to have only a slight eosinopenic effect, which would not contribute appreciably to the biological activity detected in these ascitic fluid extracts.

It may be concluded, therefore, that almost all of the biological activity observed is due to the content of 17-hydroxycorticosterone, and that this varies in different samples of ascitic fluid from zero to about 5 µg. per 100 ml. Cortisone itself does not contribute to the biological activity in significant degree.

It is, of course, clear that one cannot assume that the hormone content of ascitic fluid is necessarily the same as that of circulating blood. Ascitic fluid may, however, be regarded as representing a form of extracellular fluid. Its hormone content may be indicative of the adrenal hormone content of extracellular fluid in general, a content which must be of more direct importance to living cells than is the hormone content of the blood. Our inability to demonstrate any hormonal activity in the two samples from patient Fr raises the possibility that conditions may sometimes exist in which adrenal cortical hormone diffuses with difficulty from the blood into the extracellular fluid. Such a state could account for the fact that rheumatoid arthritic tissues and joints respond promptly to cortisone or 17-hydroxycorticosterone therapy, although all the evidence suggests that adrenal cortical function is normal in this disease. While this suggestion is purely speculative at the present time, further investigation of the hormonal content of human ascitic fluid should prove of considerable interest, in so far as it is representative of an extracellular fluid.

Summary

The adrenal cortical hormone content of human ascitic fluid has been measured biologically, using the power of such hormones to lower the level of circulating eosinophil cells in adrenalectomized mice.

Of ten samples of ascitic fluid tested, five showed activity equivalent to between 3 and 5 µg. of cortisone per 100 ml. In two samples from one patient no activity at all could be detected. In the remaining three activity was equivocal and less than 1.5 µg. per 100 ml.

17-Hydroxycorticosterone (compound F) was detected by chromatographic analysis in all four samples in which it was sought, but cortisone was found only as a faint trace in a single extract. The biological activity is apparently due almost entirely to the 17-hydroxycorticosterone, only a negligible part being due to cortisone.

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The successful use of piperazine in the treatment of threadworms was first recorded by Mouriquand, Roman, and Coisnard (1951) and later by Turpin, Cavier, and Savaton-Pillet (1952). Mouriquand *et al.* used piperazine hydrate in solution, while Turpin *et al.* chose piperazine diphenylacetate in the form of glutenized granules. In most instances oral dosage was supplemented by the use of piperazine suppositories. The clinical trials carried out by both groups of workers were preceded by successful preliminary experiments upon the mouse *Aspicularis* or *Syphacea*. In the clinical trials Mouriquand *et al.* reported a high proportion of cures in 18 patients, while Turpin *et al.* recorded one definite failure out of 41 patients.

We ourselves decided to carry out clinical trials following successful experiments with piperazine hydrate against *Aspicularis* in the mouse (Standen, 1953). As a comparative standard, gentian violet was also included, and, in addition, diphenan, which has achieved considerable popularity on account of its lack of toxic side-effects. Laboratory tests had failed to demonstrate oxyuricidal properties in diphenan. These results were in keeping with the clinical findings of Miller and Choquette (1950), Beaver and Young (1950), Dowsett and Brown (1953), Jung and Beaver (1953). In contrast, Killingsworth *et al.* (1952), using diphenan in conjunction with hexylresorcinol enemas, reported 77% cures, while Bumbalo *et al.* (1953) reported 30% cures with diphenan alone. Killingsworth *et al.* and Van Someren (1939) both quote Schulemann (1920) as stating that diphenan breaks down in the small intestine to form para-benzylphenol, and that this kills oxyurids in 5–10 minutes at 1:4,000 dilution. In fact, Schulemann was working with "Strudelwürmen," which are free-living turbellarians and not in any way related to oxyurids in particular nor to nematodes in general. It is considered that this mistranslation of Schulemann's work should be recorded, since it appears to be in danger of perpetuation in the literature.

Clinical Tests

The material used in the tests consisted chiefly of children admitted to hospital for medical or surgical reasons, and these were identified as cases of *Enterobius infection* by microscopical examination of adhesive "cellophane" swabs of the perianal area. Swabbing was carried out in the morning before the children were bathed or used the toilet, and was repeated for seven days unless a positive result was obtained earlier. In addition, previously established cases of oxyuriasis were included. For purposes of comparative drug effect the children were treated in four groups, each group receiving piperazine, gentian violet, diphenan, or a lactose placebo.

Treatment

(a) *Piperazine*.—Used in the form of piperazine hexahydrate embodied in a flavoured syrup. The children receiving piperazine were divided into two groups, one receiving 100 mg. and the other 250 mg. per day per year of life, the drug being given in divided doses, morning and evening. Treatment continued for seven days, and a second similar course was given after seven days' rest.

(b) *Gentian Violet*.—Given as sugar-coated pills at a dose level of approximately $\frac{1}{4}$ gr. (11 mg.) daily per year of life in divided dosage for seven days and repeated after seven days.

(c) *Diphenan*.—Given as whole or fractions of plain 500-mg. tablets. Owing to difficulty in subdivision of tablets to suit each year of age, the children were arranged in broad age groups. Inevitably this meant a range in dosage from approximately 100–300 mg. t.d.s. per year of life in the lower dosage group and approximately 200–600 mg. t.d.s. for those at higher dosage. The course of treatment was for seven days, and was repeated after seven days' rest.

(d) *Lactose Placebo*.—A control group was considered highly desirable in order to determine the degree of spontaneous cure. The placebo was given morning and evening in two courses of seven days as with the other drugs.

Follow-up

Swabbing of the perianal area with adhesive cellophane was begun 14 days after completion of the second treatment period, and was continued each morning for seven successive days. Any single swab showing one or more ova indicated failure to cure, while seven successive negative swabs formed the criterion for cure.

Hygienic Precautions

In most instances the children received treatment as outpatients, and it was considered unrealistic to expect parents to adhere uniformly to strict hygienic precautions. Consequently, beyond instruction concerning general cleanliness, no special precautions were imposed. Thus the trials were carried out under conditions that would normally prevail in an average household.

Toxicity and Side-effects

(a) *Piperazine*.—During the first quarter of the century piperazine was widely used in the treatment of gout and allied conditions, but it has fallen into disuse because of ineffectiveness in these complaints. Consequently many reports have been published concerning its use in this respect and no important toxic effects have been recorded. Absence of toxicity has been reported by numerous authors, notably Frankel (1921), Gadamer (1924), Fayard (1949),

Mouriquand *et al.* (1951), and Cavier (1953). Recent pharmacology and toxicity studies in laboratory animals (De Beer, unpublished) failed to elicit any significant toxic effects. In our experience during clinical trials only one case showed intolerance. At a dose level of 58 mg./kg. per day, this child complained of loose stools. When treatment was discontinued the diarrhoea ceased immediately. The drug was, in fact, found to be extremely well tolerated even up to dose levels of 150 mg./kg. daily. This higher dose relates to treatments of ascariasis, which will form the subject of a further communication.

(b) *Gentian Violet*.—Out of 20 cases treated two complained of abdominal pain and one experienced nausea and vomiting during the first week of treatment. Otherwise no side-effects were reported.

(c) *Diphenan*.—Treatment with diphenan produced no toxic side-effects.

Results

Comparative Results.—At 100 mg. per day per year of life piperazine hydrate gave a lower cure rate than gentian violet at $\frac{1}{4}$ gr. (11 mg.) daily per year of life (see Table)—that is, 54% and 70% respectively. At the higher dose level of 250 mg. per day per year of life the cure rate for piperazine hydrate was much enhanced, giving 83% cures out of 42 cases treated. The efficiency of diphenan at both dose levels (see Table) closely resembled that of the lactose placebo—that is, 17% out of 23 cases and 19% out of 16 cases respectively.

Analysis of Piperazine Results.—It was appreciated that considerable weight variation occurred within each age group tested, and analysis of the total results of piperazine hydrate tests at both dose levels (see Fig.) shows that on a weight/dose/cure ratio a cure rate of 97% was obtained where the daily dose exceeded 50 mg./kg. body weight.

Conclusions

The results obtained from the clinical trial of piperazine hydrate, gentian violet, diphenan, and a lactose placebo as control showed that while gentian violet had a marked oxyuricidal effect (70% cures) at a dose level of $\frac{1}{4}$ gr. (11 mg.) daily per year of life, this was well surpassed by piperazine hydrate syrup when the dose level was in excess of 50 mg./kg. per day, and the cure rate reached 97%. Though diphenan gave a cure rate of 17% at a dosage of 100–600 mg. daily per year of life, this apparent oxyuricidal effect was discounted by the fact that 19% cure was obtained with a lactose placebo control. The latter indicated that a spontaneous clearance of threadworms may be expected in approximately 19% of infections. Thus piperazine hydrate syrup proved to be the most effective, while producing negligible side-effects; gentian violet was less effective, and was also undesirable on account of its nauseating effects and staining properties; diphenan was ineffective. It is concluded that piperazine hydrate, at a dose level of 50–75 mg./kg. per day, is the drug of choice for the treatment of oxyuriasis in children.

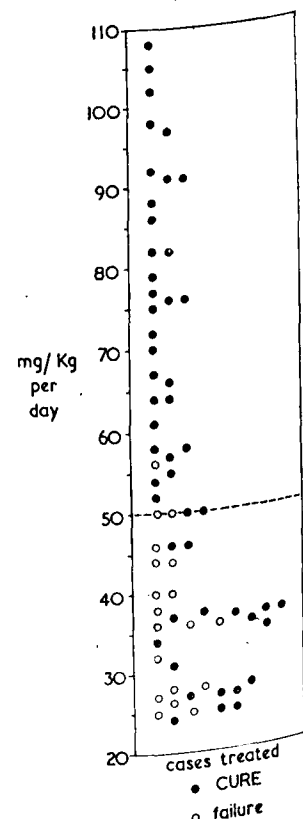


Chart showing relationship of dose of piperazine hydrate in mg./kg. per day to cure in 69 cases of oxyuriasis.

Summary

In clinical trials of piperazine hydrate, gentian violet, and diphenan against oxyuriasis in 136 children, piperazine hydrate syrup and gentian violet showed marked oxyuricidal properties, while diphenan was inactive.

Owing to lack of toxicity and side-effects, to ease of administration, and to its excellent therapeutic properties, piperazine hydrate syrup at a dose level of 50–75 mg./kg. per day is considered to be the drug of choice for oxyuriasis in children. Of 31 children treated at levels greater than 50 mg./kg. daily 97% were cured.

The use of suppositories is unnecessary.

Spontaneous cure may be expected in 19% of cases of oxyuriasis.

The facilities provided by Dr. Philip R. Evans in the Department of Child Health at Guy's Hospital and the Evelina Hospital, London, are gratefully acknowledged. The guidance and advice of Dr. R. C. MacKeith, Guy's Hospital, are deeply appreciated. Without the co-operation of the medical and nursing staffs at these two hospitals this work could not have been completed, and to them our greatest thanks are extended.

The piperazine hydrate used in these trials was provided by Messrs. Burroughs Wellcome and Co. as "antepar" elixir.

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EXPERIMENTAL CHEMOTHERAPY
OF OXYURIASIS

BY

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The two drugs most commonly used in the treatment of oxyuriasis are gentian violet and diphenan. From time to time claims of efficacy in clearing threadworms have been made for other substances, notably aluminium 8-hydroxyquinoline ("nyxolan"), N-isoamylcarbaminic acid-3-methyl-6-isopropyl phenyl ester ("egressin"), and garlic preparations. Owing to the length of the life cycle and the possibilities of auto-infection, properly controlled clinical trials against *Enterobius (Oxyuris) vermicularis* are extremely complicated. The eight weeks or so required for diagnosis, treatment, and follow-up is longer than children usually remain in hospital, and any trials started under the control and supervision of the medical and nursing staff must be continued with the co-operation of the parents. The difficulties inherent in such an arrangement probably account for the relatively few occasions upon which adequate clinical trials have been made with potential oxyuricides. Obviously some

laboratory method of screening drugs of this kind is desirable, so that these cumbersome clinical trials may be initiated only when justified by experimental evidence.

As no laboratory animal has been found that will act as host to *E. vermicularis* the oxyurids of rodents have been employed for chemotherapeutic trials. The laboratory evaluation of egressin was carried out using *Passalurus ambiguus* in the rabbit (Eichholtz and Hotovy, 1950); *Aspicularis tetraptera*, oxyurid of the mouse, was used for study of the oxyuricidal properties of antibiotics (Wells, 1951a, 1951b, 1952a, 1952b); *Syphacia obvelata* in the mouse was used by Chan (1952) for screening a number of potentially active substances, while Turpin *et al.* (1952) tested piperazine against both *Aspicularis* and *Syphacia*. Mouriquand *et al.* (1951) used piperazine hydrate against *A. tetraptera* in the mouse.

A. tetraptera occurs naturally in the caecum and rectum in many laboratory strains of white mice. For the experimental work here described it was decided to use such natural infections with this parasite and to carry out a series of tests on substances of reputed activity against human threadworms. Tests on certain closely related substances were also to be included. By this means it was hoped to determine whether tests against *A. tetraptera* in the mouse would provide valid indications of activity against *E. vermicularis* in man and to demonstrate substances worthy of clinical trials.

Material and Method

White mice 11–12 weeks old showing ova of *Aspicularis* in the faeces were segregated and used for drug-testing. Necropsy of untreated mice showed a range of 2–120 worms per mouse. Because of the relatively small number (10–20) of mice that could be used in each test it was considered that this range in numbers of worms was too large to warrant valid statistical deductions to be drawn on the basis of reduction in worm numbers following treatment. Therefore the degree of activity of a drug was estimated in relation to the dose required to clear the worms from all or a proportion of the mice treated. The drugs were given orally by stomach tube as a solution or suspension in water or liquid paraffin. The animals were dosed either once or twice daily for five consecutive days. According to the availability of infected mice, 10–20 animals were used for each test. Faecal examinations were made at six days and necropsy at 12 days after completion of treatment. In some instances necropsy was carried out at six days after treatment without prior faecal examination.

To facilitate worm counts the rectum and caecum of each mouse were removed at necropsy and placed in Bouin's fixative. Material fixed in this way could be stored and examined when convenient. At examination this portion of the gut was slit open under water and the contents were removed gently with a camel-hair brush. The inside of the examination dish was painted black, and the worms, now stained bright yellow, were easily seen and counted against this background.

Results

Table I shows the relative efficiency of a number of reputed oxyuricides in clearing mice of *Aspicularis*. None of the drugs used, except perhaps oil of garlic, was particularly toxic* at the dosages employed, and only two, gentian violet and piperazine hydrate, produced any marked worm clearance. In seven other instances partial clearances were obtained, but four of these (Nos. 4, 6, 10, and 13)

* All mice on test had been exposed to infection with *Schistosoma mansoni*. A proportion of the mouse mortality would result from this.

Table showing the Comparative Effectiveness of Drugs Used in Clinical Trials Against *Enterobius vermicularis* Infections in 136 Children

Drug	Daily Dose per Year of Life	Age Range	Total No. Treated	Cases Followed Up			
				Total No.	No. of Cures	No. of Failures	% Cures
Piperazine hydrate	100 mg.	1½–11 3 adults	44	35	19	16	54
	250 mg.	1½–13 2 adults	64	42	35	7	83
Gentian violet	1/6 gr. (11 mg.)	2½–12	38	20	14	6	70
Diphenan	100–300 mg.	1½–11	34	22	4	18	18
	200–600 mg.	11	7	1	—	1	—
	Combined results	1½–11	41	23	4	19	17
Lactose placebo	—	2–7	36	16	3	13	19

TABLE I.—Showing the Relative Efficiency of Several Reputed Oxyuricides and Some Related Compounds in Clearing Mice of Naturally Acquired Threadworm (*Aspiculuris tetraptera*) Infections

No.	Drug	Oral Dose (mg./kg.)	No. of Doses Daily	Total Dose (mg./kg.)	Mice Surviving at Necropsy	Days After Treatment	% Mice Cleared of Worms	Average No. of Worms per Mouse	Range in No. of Worms	Drug Efficiency Rating
1	Gentian violet	90	1	450	16/20	12	80	7	2-11	+++
2	Piperazine hydrate	400	1	2,000	13/13	12	100	0	—	++++
3	N-carbathoxypiperazine hydrochloride	400	1	2,000	12/13	12	0	44	8-183	—
4	1-Diethylcarbamyl-4-methylpiperazine citrate ("banocide," "hetrazan") syrup	500	1	2,500	9/10	12	10	24	2-77	—
5	N-isoamylcarbaminic acid-3-methyl-6-isopropyl phenyl ester ("egressin")	500	1	2,500	9/12	12	0	37	4-152	—
6	Aluminium 8-hydroxyquinoline ("nyxolan") syrup	200	2	2,000	9/12	6	0	68	11-158	—
7	Diphenan	60	2	600	10/10	12	10	37	2-94	—
8	Quinoxaline	700	1	3,500	18/20	12	0	101	18-154	—
9	Mepacrine	150	2	1,500	11/12	6	0	94	37-187	—
10	Phenothiazine	100	1	500	12/12	6	25	29	3-60	+
11	Santonin	200	1	1,000	9/10	12	8	62	15-114	±
12	Hexylresorcinol	20	1	100	9/12	12	20	38	3-107	—
13	Dried garlic ("allicin")	10	1	50	12/13	12	40	67	2-125	+
14	Oil of garlic	200	2	2,000	8/10	12	10	83	53-165	—
15	Allyl sulphide	10 ml. per kg.	2	100 ml. per kg.	6/10	12	0	45	5-121	—
16	Liquid paraffin	10 ml. per kg.	2	100 ml. per kg.	8/10	12	0	61	2-121	—
					5/5	12	0	56	20-72	—

TABLE II.—Showing the Graded Dosage Effect of Gentian Violet and Piperazine Hydrate in Clearance of *Aspiculuris tetraptera* from Naturally Infected Mice

Drug	Oral Dose (mg./kg.)	No. Doses Daily	Total Dose (mg./kg.)	Mice Surviving at Necropsy	Days After Treatment	% Mice Cleared of Worms	Average No. of Worms per Mouse	Range in No. of Worms	Drug Efficiency Rating
Gentian violet	100	1	500	5/10	12	100	0	—	++++
	90	1	450	16/20	12	80	7.0	2-11	+++
	50	1	250	10/10	12	100	0	—	++++
	25	1	125	10/10	12	0	31.0	2-61	—
Piperazine hydrate	400	1	2,000	13/13	12	100	0	—	++++
	200	1	1,000	10/13	12	90	0.1	0-1	+++
	100	1	500	13/13	12	62	3.0	1-8	++
	50	1	250	12/13	12	31	40.0	2-212	+

were of 10% or less, and can be ignored. Other clearances—hexylresorcinol (40%), mepacrine (25%), and santonin (20%)—were not convincing. In the case of hexylresorcinol the 40% clearance was obtained with 10 mg./kg. unit dose, but no clearance resulted when the dose was doubled. Obviously some spontaneous clearance may occur, and unless reasonably uniform results are produced in repeated tests isolated successes must be disregarded.

The clearance rates obtained with gentian violet and piperazine were further investigated. The results of these further tests, together with the original ones, are given in Table II. It will be seen that gentian violet gave a ++++ rate at 50 mg./kg. unit dose, but failed to clear at 25 mg./kg. Piperazine hydrate gave a good response at 400 and 200 mg./kg. unit dose, and at most dose levels the numbers of worms left were very small. In the piperazine 50 mg./kg. group one mouse had 212 worms, whilst the average for the remaining seven positives was only 15. At the 200 mg./kg. level only one mouse remained infected, and this had only one worm, whilst the scanty worm burden remaining at the 100 mg./kg. dose level is perhaps additional evidence of drug activity.

It may be concluded that, in terms of dose/weight ratio, gentian violet is rather more efficient in clearing mice of *A. tetraptera* than is piperazine hydrate, but, nevertheless, piperazine is highly promising and is worthy of clinical trial. The rate at which the intestinal contents move in the mouse is very high compared with that in man, and it is conceivable that in the human subject the piperazine may be absorbed or destroyed before it reaches the worms.

Since this work was completed, clinical trials of piperazine hydrate, gentian violet, and diphenan have been concluded (White and Standen, 1953). The activity of piperazine hydrate and gentian violet against *Aspiculuris* in the mouse is confirmed against *Enterobius vermicularis* in children,

whilst diphenan, inactive against *Aspiculuris*, was similarly shown to be of no value in the treatment of human oxyuriasis. The comparative evidence so obtained justifies the use of *Aspiculuris* in a laboratory screen against threadworm infestation.

Summary

Aspiculuris tetraptera, threadworm of the mouse, was used to test the efficacy of reputed oxyuricides. Of these, only gentian violet and piperazine hydrate cleared the mice of worms.

Drug-testing against *Aspiculuris tetraptera* in the mouse is of considerable value in establishing the efficiency of oxyuricides prior to clinical trial.

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Regulations which came into effect on September 1 control the manufacture of aureomycin. When it is intended for parenteral injection it may not be manufactured for sale except under licence and in conformity with prescribed conditions as to strength, quality, and purity. The regulations are entitled the Therapeutic Substances Amendment Regulations, 1953.

VAGINAL ULCERATION DUE TO POTASSIUM PERMANGANATE

BY

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Over 100 cases of vaginal ulceration following the insertion of potassium permanganate tablets for the purpose of procuring an abortion have been described since the first account of this condition by Lacassagne and Friess in 1932. Voron, Rochet, and Contamin (1935) reported a case in which severe arterial bleeding resulted from the ulceration in the vagina. Shull (1941), among 17 patients with a similar condition, followed up four in whom pregnancy was confirmed; only one patient miscarried. The largest series has so far been described by McDonough (1945). Of 65 patients, 34 required packing of the vagina to control the bleeding and 12 needed transfusion. In 40 patients pregnancy was confirmed; six miscarried, and one was delivered by caesarean section on account of scarring following the vaginal ulceration. Blondin, Benassy, and Masse (1948) added two more cases. Jetter and Hunter (1949) described the case of a woman who died after using a douche of saturated permanganate solution containing a total of over 7 g.

The first account in the British literature was reported by Miller (1951), who described 10 cases. In some of these he found ligation of arterial bleeding points in the base of the ulcer necessary, and formed the opinion that pregnancy remained undisturbed unless the tablets were introduced into the region of the cervix. Henderson and Watt (1951) reported that they had seen cases for many years, and caesarean section had been necessary in three on account of scarring of the vagina.

The following four cases seen at St. Bartholomew's and the London Hospitals are described to draw further attention to the widespread practice of using potassium permanganate, especially in tablet form, as an "abortifacient," and to deprecate the method as an effective means of terminating pregnancy. In the first case, seen in the gynaecological department at St. Bartholomew's Hospital, although typical vaginal ulceration was present the use of potassium permanganate tablets inserted direct into the vagina was not established. One of the other three cases was seen in the gynaecological department of the London Hospital, and a history of using tablets followed by vaginal bleeding was obtained, but no vaginal ulceration was seen. The remaining two patients first attended at the Whitechapel Clinic of the London Hospital. In both these cases the diagnosis was fully established and photographic records were made.

Case 1

A 3-para aged 38 attended St. Bartholomew's Hospital on November 25, 1950, with vaginal bleeding in pregnancy. Her last regular period had begun 23 weeks before attending. Vaginal bleeding, she stated, had occurred two weeks

later, and had continued intermittently until a heavy loss a week previously, after which it had ceased. She admitted using a douche made up with potassium permanganate tablets, but denied inserting any of these tablets directly into the vagina.

Examination showed a healthy woman; the uterus was enlarged to the size of 24 weeks' gestation, and the foetal heart was audible. In the vagina were two apposition ulcers, one in the anterior and one in the posterior wall, about 5 cm. from the introitus. A grey slough was present in the base of each, and both bled readily to the touch. Routine investigations in the special treatment centre, including dark-ground examinations, all proved negative. During the next two weeks healing of the ulcers took place with no scarring, and arrangements for antenatal care were made, but the patient subsequently defaulted.

Case 2

A single nulliparous girl aged 16 was admitted to the London Hospital on January 19, 1952, on account of vaginal bleeding in pregnancy. Her last regular period had begun 22 weeks previously. Twenty-four hours before admission, she stated, she had inserted two tablets of potassium permanganate into the vagina. A few hours later she experienced slight pain in the lower abdomen associated with bright vaginal bleeding.

Examination showed a healthy girl with the uterus enlarged to the size of 22 weeks' gestation. No vaginal ulceration was seen on examination with a speculum. Pregnancy was confirmed by an Aschheim-Zondek test, and the patient gave birth to a live premature infant 12 weeks later.

Case 3

A single nulliparous woman aged 22 attended the London Hospital on February 14, 1952, with a history of pain and swelling of the vulva for two days associated with dysuria. Her last regular period had begun five weeks previously; the normal cycle was 28 days.

Examination showed two shallow apposition ulcers with greyish bases 1.5 cm. in diameter on the inner aspect of the labia minora. Black debris which was scattered elsewhere over the vulva consisted of manganese dioxide produced by the breakdown of potassium permanganate. On passing a speculum another two apposition ulcers, circular and deeper than those on the vulva, were seen in the anterior and posterior vaginal walls just below the level of the cervix, with a disintegrating tablet *in situ*, and further brownish-black debris was scattered over the vaginal wall. All routine investigations, including dark-ground examination of the ulcers, proved negative.

It was only on further questioning that the patient gave the following details. Eight days before attending, fearing she might have conceived, she had inserted tablets into the vagina just before her next period was due. She had worn a sanitary pad to retain them. Heavy vaginal bleeding had ensued. It is assumed that the vulval ulceration had been caused by one of the tablets slipping down between the labia shortly after insertion. On her next attendance the patient brought for inspection a tablet similar to those she had inserted. This was analysed and found to be a compressed tablet of 5 gr. (325 mg.) of potassium permanganate.

During the next four weeks the ulcers healed completely without residual scarring. The cervix became softened and the uterus enlarged; three weeks after the patient first attended an Aschheim-Zondek test confirmed that she was pregnant.

Case 4

A single nulliparous woman aged 28 attended the London Hospital on May 13, 1952, with a history of brown vaginal discharge. The last menstrual period had been nine weeks previously. Her normal menstrual cycle was 28 days, and, believing herself to be pregnant, she had inserted three tablets of potassium permanganate into the vagina three days before

attending. Slight bleeding began the following day. She produced a bottle of 100 2-gr. (130-mg.) tablets of potassium permanganate which she had obtained from a chemist.

Examination of the vagina with a speculum revealed a deep circular ulcer 1.5 cm. in diameter on the portio vaginalis of the cervix to the right of the external os. A similar ulcer lay in apposition on the right vaginal wall (see accompanying photograph). Much black debris was present in the vagina. The cervix was soft, and the uterus enlarged to correspond with the period of amenorrhoea. Routine investigations, including dark-ground examinations of the ulcers, were negative. The Aschheim-Zondek test was positive. Analysis of one of the tablets confirmed that it was potassium permanganate.



Photograph showing appearance of cervix and posterior vaginal fornix in Case 4.

At subsequent attendances the ulcers were seen to heal slowly and spontaneously, and after three weeks' observation no trace of them, and no scarring, remained. The patient miscarried one month later as a result of interference of a different kind.

Discussion

Of the four cases described, three were found to have the characteristic apposition ulcers produced by potassium permanganate in high local concentration. Three patients gave a history of inserting tablets to achieve abortion; the remaining one admitted only using a solution of tablets in a douche, although typical circular vaginal ulcers were found. Bleeding occurred in all four cases, although in none was it enough to warrant the measures described by other writers. Abortion did not occur as a result of the use of tablets in any of the patients. This conforms to the experience of others that the agent is not usually an effective abortifacient. It should be noted that two patients first attended at a gynaecological out-patient department, and two at a special treatment centre. A history of pregnancy may not be forthcoming, the irregular bleeding being the only complaint. The use of tablets may not be admitted initially by the patient. Therefore correct diagnosis of the condition may rest upon finding the characteristic circular apposition ulcers in the lower genital tract, with the remains of a tablet or the brownish-black debris of manganese dioxide still *in situ*.

The similarity of these ulcers to primary chancres in the male was pointed out by Blondin *et al.*, who described the practice of certain legionaries who lingered by inserting a tablet of potassium permanganate under the prepuce. A provisional diagnosis of primary syphilis in women with lesions suggesting contact chancres is therefore likely to be made until full investigations, including dark-ground examination and serological tests, fail to confirm the diagnosis. It is then that further questioning may reveal the true history of the use of potassium permanganate tablets as an abortifacient.

2-gr. and 5-gr. (130-mg. and 325-mg.) tablets of potassium permanganate are readily obtainable at chemists. There is no restriction on their sale.

Summary

Four cases of bleeding following the insertion of potassium permanganate into the vagina in pregnancy are described.

The use of this chemical in tablet form was confirmed in three cases.

The typical ulceration produced is illustrated by a photograph.

The tablets used in two cases were subjected to chemical analysis.

The possible confusion of the lesion with primary chancres, especially in patients who conceal the true history and first attend at special treatment centres, is pointed out.

The common use by women of potassium permanganate in tablet form for procuring abortion and the ease with which it may be obtained for this purpose are stressed. It does not appear to be an effective abortifacient.

ADDENDUM.—Since preparing this report one of us (E. A. J. A.) has seen a fifth patient, in whom very heavy bleeding was caused by the vaginal ulceration. A single girl aged 19, who subsequently admitted inserting tablets of potassium permanganate into the vagina for fear of pregnancy, was admitted on account of a sudden profuse haemorrhage. After half a pint (285 ml.) of fresh blood clot had been removed from the vagina, ulcers were seen on the anterior and posterior walls. The anterior ulcer had eroded the wall of a large artery, which was bleeding freely. Ligation of the vessel was necessary.

Our thanks are due to Dr. Ambrose King, senior physician at the Whitechapel Clinic of the London Hospital; to Dr. Eva Gallagher, who assisted in the follow-up of cases in the Whitechapel Clinic; and to the photographic department of the London Hospital. Permission to describe their cases is gratefully acknowledged to Mr. Wilfred Shaw and Mr. Donald Fraser at St. Bartholomew's Hospital, and to Mr. Alan Brews at the London Hospital.

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Launching the autumn recruiting campaign for the National Hospital Service Reserve last month, the Minister of Health, Mr. Iain Macleod, said that in order to be ready to meet the demands of war the Reserve must increase its present strength of 30,000 volunteers to 100,000. He hoped that the new drive for recruits would carry the total well on its way to this target. The Reserve had its role in peacetime too, in dealing with the emergencies of everyday life. "We have had some pretty grim reminders of this in Lynmouth and the East Coast floods and two terrible railway disasters within the last twelve months," he said. "It may not be generally realized," he continued, "that each year there are over one million serious accidents in our homes—serious enough, that is, to require treatment in hospital—and that another 200,000 injuries occur on the roads. With these facts in mind I ask myself: Should not every man and woman have some training in first-aid and simple home-nursing, and would not women gain in confidence and competence if they added practical knowledge of first-aid and petence to their many other accomplishments? The simple nursing to their many other accomplishments? The chances are that each one of us some time in our lives will be confronted with a serious accident or injury in our homes, at work, on holiday, or on the roads. We all dread the possibility, but knowledge and training would take the dread out of such occasions, substituting confidence and competence for fear and futility."

PREGNANCY AND GAUCHER'S DISEASE

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Gaucher's disease is a rare condition affecting the reticulo-endothelial system, which is loaded with a complex lipo-protein (kerasin, a cerebroside) not normally found in the body. Clinically this condition is known to be characterized by an enlargement of the spleen, sometimes reaching to enormous dimensions, a much less marked hepatomegaly, moderate anaemia, leucopenia, and thrombocytopenia, with a tendency to bleeding, skeletal changes, a brownish pigmentation of the skin, and frequently a peculiar yellowish thickening of the conjunctiva (pinguicula). Most of the above manifestations are due to an invasion of the spleen, liver, and bone marrow by large histiocytic elements with a foamy cytoplasm charged with kersin, which are termed Gaucher's cells and are pathognomonic of the disease.

The condition has a familial tendency and may appear in infancy and childhood, but diagnosis is usually arrived at in the adult. Females are more often affected than males, and the disease has a predilection for the Jewish race.

We were repeatedly confronted with the problem of management of pregnancy in Jewish patients affected by Gaucher's disease, and, surprisingly enough, could find no data in the available literature on this subject. Indeed, the only reference to the influence of the disease on the female genital functions concerns the frequent occurrence of menorrhagia (Brill and Mandlebaum, 1913). The haemorrhagic tendencies, the anaemia, the splenomegaly, the destructive changes in the bones, and the poor general condition of these patients may lead obstetricians to consider the interruption of pregnancy. We felt, therefore, that a report of our experience of Gaucher's disease complicated by pregnancy might be helpful for an evaluation of the risks involved.

Material

The present study is that of a group of seven Jewish women of Eastern European extraction affected by Gaucher's disease in whom the course of 13 pregnancies was recorded (Table I). Nine were deliveries at

TABLE I.—Data on Pregnancies in Seven Women Affected by Gaucher's Disease, in Relation to Establishment of the Diagnosis

Case No.	Age at First Examination	Age at Appearance of Symptoms	Age when Disease Diagnosed	Age at Marriage	No. of Pregnancies	Age at Pregnancy				Full-term Delivery	Children Alive	Therapeutic Abortions
						1st	2nd	3rd	4th			
1	34	32	34	21	3	30	34	36	—	2	1	1
2	26	24	26	22	2	23	25	—	—	1	1	—
3	33	18	28	26	1	26	—	—	—	1*	1†	—
4	29	10	24	20	1	24	—	—	—	1	1	—
5	32	31	32	26	1	27	—	—	—	1	1	—
6	25	?	25	19	4	25	27	29	32	2	2	—
7	12	12	16	20	1	21	—	—	—	1	1	—

* Twins. † One was a stillbirth (cerebral haemorrhage).

term, resulting in nine living offspring, and four pregnancies were interrupted. One of the patients had a twin pregnancy, and on delivery bore one living child, the other being stillborn. The pregnancies occurred between the ages of 21 and 36 years. The first pregnancies were preceded by a marriage interval of 0.5–1.5 years in four cases (Cases 2, 3, 5, and 7), whilst in three cases conception was preceded by a period of sterility, involuntary in one case (Case 6) and voluntary in two cases (Cases 1 and 4).

Parity.—Four out of seven patients had only one pregnancy, which ended with a full-term delivery (Cases 3, 4, 5, and 7), while three others had respectively three, two, and four pregnancies (Cases 1, 2, and 6). Case 1 had two full-term deliveries and one artificially induced abortion. Case 2 had one full-term pregnancy and one artificially induced abortion. Case 6 had two full-term pregnancies and two induced abortions (the abortions in all cases having been performed because of Gaucher's disease). The patients who conceived only once had been discouraged by their medical advisers from venturing upon further pregnancies. It should be mentioned that the current medical opinion among the physicians of Israel is that pregnancy involves increased risks for the patient affected by Gaucher's disease, and that the majority of full-term pregnancies reported in the present paper occurred, therefore, before the diagnosis of the disease was established.

In all cases reported (Table I) the diagnosis was based on the absolute criterion of finding Gaucher's cells in the bone marrow or spleen. The clinical manifestations and relevant laboratory findings are given in Table II.

Menstrual History.—In three of the seven cases periods of menorrhagia were recorded (Table II). In none was the increased blood loss during the menstrual periods severe enough to require special treatment. Menstruation occurred regularly during the observation periods of two to seven years. In Case 4 a short period of amenorrhoea occurred, lasting three months. Cases 2 and 6 became pregnant while suffering from menorrhagia, indicating that this increased menstrual flow was not associated with failure to ovulate.

Influence of Gaucher's Disease on Course of Pregnancy

In this series there was no case of spontaneous abortion or premature labour. The course of pregnancy was not complicated by the toxæmias or by haemorrhagic accidents. It should be noted that the enormous spleen typical of the disease does not interfere with the normal increase in size of the gravid uterus. This was our experience with two cases (Nos. 1 and 6) in which no distress resulted from the pressure of the uterus on the enlarged spleen and liver. All the babies delivered at full term were normally developed and their birth weights within normal range. No case of foetal death *in utero* occurred. In Case 3, a twin pregnancy, one foetus died during delivery, and post-mortem examination revealed a cerebral haemorrhage. The course of labour in all cases was uneventful. The third stage was not complicated by haemorrhage of more than an average amount, in spite of the known tendency to bleeding found in these patients. Lactation was normal in all but one case.

Influence of Pregnancy on Gaucher's Disease

It was our experience that pregnancy did not adversely affect the course of Gaucher's disease. On the contrary, in at least two patients there was an increased feeling of well-being during pregnancy (Cases 4 and 6). That in these two cases the diagnosis of Gaucher's disease was made during pregnancy was not due to any deterioration in the condition of the patient but to the finding of splenomegaly on

TABLE II.—Clinical Symptoms and Relevant Laboratory Findings in Seven Patients Affected by Gaucher's Disease

Case No.	Spleen	Liver	Bones	Pigmentation	Pin-guicula	Haemorrhages (At Time of First Examination and in Previous History)	Bone Marrow	Splenic Puncture	Blood Picture	Blood Cholesterol (mg./100 ml.)	Remarks
1	Hard. Enlarged to 2 fingers above iliac crest	4 fingers below costal margin	No changes	Dark pigmentation of exposed parts and of oral mucous membranes	Bilateral	Subungual. Ano-rectal. Menorrhagia	Gaucher's cells	—	R.B.C. 3,600,000. W.B.C. 3,600. Hb 10 g./100 ml. Thrombocytes 110,000	150-190	2 weeks after second delivery
2	Hard. Enlarged to 2 fingers below iliac crests	Hard. 3 fingers below costal margin	"Erlenmeyer flasks" in both femurs	Dark pigmentation of face, especially forehead and cheeks	—	Menorrhagia	"	—	R.B.C. 3,400,000. W.B.C. 4,200. Hb 10 g./100 ml. Thrombocytes 90,000	130-160	
3	Hard. Level with iliac crests	Hard. Reaches to iliac crests	"Erlenmeyer flasks" in both femurs*	Pigmentation of face, especially forehead	Bilateral	Subcutaneous	"	Gaucher's cells	R.B.C. 4,200,000. W.B.C. 2,100. Hb 12 g./100 ml. Thrombocytes 280,000	165	
4	Hard. Reaches the symphysis pubis	Hard. 2 fingers below costal margin	No changes	Yellowish, of the face	—	Epistaxis	"	"	R.B.C. 3,200,000. W.B.C. 2,600. Hb 9 g./100 ml. Thrombocytes 60,000	90-100	
5	2 fingers above iliac crests	Not enlarged	"Erlenmeyer flasks" in both femurs	—	—	—	—	"	R.B.C. 4,180,000. W.B.C. 3,800. Hb 12 g./100 ml.	—	
6	Hard. Reaches iliac crest	Hard. Reaches umbilicus	No changes	Yellowish, of the face	Right eye	Menorrhagia. Epistaxis. Dental. Subcutaneous	Gaucher's cells	—	R.B.C. 2,700,000. W.B.C. 3,200. Hb 9.8 g./100 ml. Thrombocytes 85,000	100-138	7 months pregnant
7	Hard. 4 fingers below costal margin	2 fingers below costal margin	No changes	—	—	—	"	—	R.B.C. 3,950,000. W.B.C. 2,800. Hb 14.8 g./100 ml. Thrombocytes 105,000	—	

* Some impairment of movements and muscular atrophy.

routine abdominal examination. The major manifestations of Gaucher's disease did not appear to be aggravated during pregnancy. No changes were noted in the size of the spleen or liver. Despite considerable thrombocytopenia (in Case 4 and in the first and second pregnancies in Case 6) no aggravation of the haemorrhagic tendency was observed. In Case 1 severe bleeding from the anorectal mucosa, a condition antedating the third pregnancy, continued during the first two months and went on unabated after the pregnancy had been interrupted. Severe skeletal changes, accompanied by impairment of function in the lower extremities, preceded pregnancy in Case 3. No further anatomical or functional damage was wrought by the pregnancy. The general impression received during the relatively short period of observation was that pregnancy or repeated pregnancies have no adverse effect upon the disease.

Discussion

The course of Gaucher's disease is a chronic one interrupted by infrequent exacerbations characterized by haemorrhagic episodes, bone pains, and a general deterioration in the patient's condition. Thannhauser (1950) states that "in the interval (between individual flare-ups), which often lasts 10 years or more, there are no complaints and no disturbances of important functions. The patient may lead a normal life and even perform hard work. . . ." Life expectancy of these patients seems to be only slightly affected, especially when symptoms become manifest during or later than the third decade (Thannhauser, 1950).

In our opinion, women affected by the disease should not be deprived of the chance of becoming mothers if a negative answer can be given to the following two questions. (1) Does pregnancy endanger the life of the woman? (2) Does the disease affect the offspring?

This study of nine full-term pregnancies in seven patients leads us to believe that childbirth does not exert any deleteri-

ous effect, either immediate or remote, upon the woman suffering from Gaucher's disease. In fact, in every case in this series there was a comfortable pregnancy, followed by a successful normal full-term delivery. It is especially important to observe that haemorrhagic complications, which could be expected in Gaucher's disease, did not in fact occur. In Case 6 we had the opportunity of studying the patient over a period of seven years, throughout the course of four pregnancies, and no deterioration in her condition was observed.

Concerning the fate of the offspring, our short period of observation allows only limited conclusions. All infants born in our series were normal at birth and subsequently showed normal development. None showed any manifestation of Gaucher's disease. No absolute evidence that the disease is hereditary has been claimed in the literature on the subject, and the chances of the child becoming affected by the same condition are negligible.

It seems justifiable to draw the conclusion that women affected by Gaucher's disease should not be denied motherhood. No justification for the interruption of pregnancy in patients affected by the disease was found in the present study.

Summary

The course of 13 pregnancies in seven patients affected by Gaucher's disease has been studied. Nine pregnancies proceeded to full-term deliveries and four were interrupted during the first trimester.

The course of the nine pregnancies which continued to term was uneventful, and they terminated in normal deliveries of apparently healthy babies.

Four pregnancies were interrupted because of the prevalent opinion that pregnancy involves serious risks for the woman affected by Gaucher's disease.

The effects upon each other of pregnancy and Gaucher's disease are discussed and the conclusions drawn that conception in women affected by the disease should not be discouraged, and that interruption of pregnancy in this condition is not justified.

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USE OF THE ELECTRODERMATOME, WITH SPECIAL REFERENCE TO ITS VALUE IN SERIOUS BURNS

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This article is based on experience with the electrodermatome during the past year at the Basingstoke Plastic Centre. Our experience in plastic and general surgery confirms the view widely held in America that the ease and reliability of cutting grafts of varying sizes and depth the electrodermatome presents an advance over other graft-cutting instruments. The graft-cutting instruments hitherto available have been the Thiersch razor, the Blair blade, the Humby knife, and the Paget dermatome. Of these the Humby knife has the widest range of general usefulness and needs the least experience for reliable results. The razor is, of course, in all respects inferior to the Blair blade, but even with the Blair blade in the most expert hands it is not possible with certainty to cut areas of graft from the thigh (the most common donor site) of more than 8 to 10 by 3 to 4 in. (20 to 25 by 7.5 to 10 cm.); the graft can be cut of uniform thickness only if it is very thin. Irregularities in thickness leading to poor donor-site scars are common. With the Humby knife grafts of 10 by 4 in. (25 by 10 cm.) can be cut with some practice. It has the added advantage of making possible grafts of medium thickness in depth; but again thickness of graft tends to vary. The Paget dermatome cuts an area of up to 8 by 4 in. (20 by 10 cm.). This instrument has been of great value in certain definitive repairs of the hand and elsewhere, but the donor-site scars are liable to keloid formation; it is a time-consuming method, and there is often trouble with the dermatome cement. Furthermore, in addition to the limitation of length it is not possible to cut thin split-skin grafts reliably with it.

There are many repairs which properly belong to the field of general surgery but which are still often referred to plastic centres simply because of the technical difficulty which current grafting instruments present to surgeons. Early experience in watching the use of the electrodermatome in a general surgical service (at the Brooke Army Hospital, San Antonio, Texas) convinced one of us that the electrodermatome could be of value in this way, as well as being an advance on other grafting instruments in the ease, speed, and reliability with

which extensive reasonably thin split-skin grafts could be cut from a variety of donor sites in patients with serious deep burns.

The Instrument

The electrodermatome was introduced in the United States after the last war. It is an electrically powered instrument in which a rapidly oscillating blade placed horizontally cuts against a lower fixed bar. The thickness of the graft can be regulated by adjusting the two micrometer screws which carry a vertically adjustable bar immediately above the knife edge. Grafts from 0.015 to 0.055 in. (0.038 to 0.138 cm.) can be cut. The maximum width of graft, which is 3 in. (7.5 cm.), can be reduced as required by a third screw which operates a pair of width guides against which the blade cuts. The length of graft is limited only by the extent of the donor area. The small electric motor is encased in metal to ensure its being spark-proof. It is connected to the instrument by means of a flexible drive shaft, and is operated on 10 volts A.C. or D.C. by a foot switch controlled by the surgeon. The knife blade is slotted into the instrument much as a razor blade into a razor, and is held there by three screws which are tightened by a spanner. We have found it possible to get good use out of blades which have been sharpened two or three times, although this is contrary to the manufacturers' experience. One blade will remain sharp during the cutting of skin from most of a thigh.

For sterilization, the dermatome, flexible shaft, and spanner are autoclaved; the blades are cold-sterilized. The motor, which does not enter the sterile field, must not be autoclaved. It is simply cleaned with a damp cloth.

Operation of the Electrodermatome

An adequate or the best available site is selected; it may be thighs, buttocks, legs, arms, chest, abdomen, or back—that is, any area except head, neck, hands, and feet. The skin of the donor site is covered with a thin coating of mineral oil such as sterile liquid paraffin. It is put on a slight stretch by the surgeon's free hand, placed behind the area from which the graft is to be cut. The dermatome is then placed with its undersurface flat against the skin. While firm pressure is maintained on it the instrument is moved slowly and steadily forward. An assistant grasps the cut edge of the skin graft with a pair of haemostats placed on each corner as the graft presents above the cutting blade, and slight tension is maintained by him on the graft. When the necessary length of graft has been cut the front of the instrument is directed upwards to sever the attachment of graft to the donor site.

Applications of the Electrodermatome

1. In Burns.—Graft cutting:—The special value of the instrument is the ease and speed with which extensive areas of graft can be cut even by those with little experience in its use. This saving of time can be of great importance during an operation in the second week in cases of serious



FIG. 1.—Early excision of sloughs with the electrodermatome. The instrument is run once or twice rapidly over the burnt area (in this case on the fifth day).

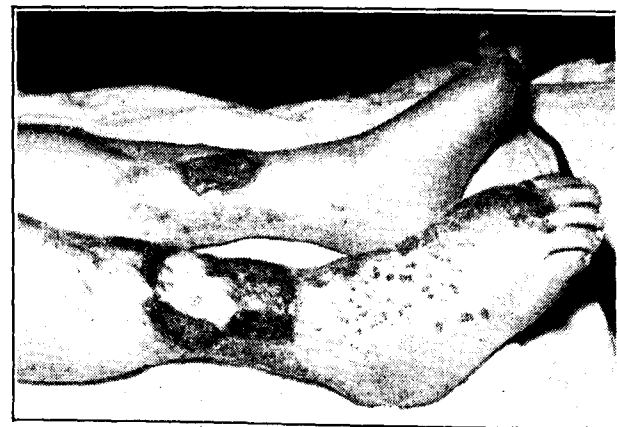


FIG. 2.—Grafting of extensive varicose ulcers. The pre-operative photograph of an elderly patient who had been in hospital for two years on account of circumferential bilateral extensive ulcers.

burns. An additional advantage is the thinness of the skin. There need therefore be less blood loss during the operation, and these donor sites can be soon "milked" again when necessary. Nor are they likely to give rise to hypertrophic and unsightly scars so often caused by the Paget dermatome. The instrument is also of value in definitive repairs for burn deformities, when medium or thicker-quality skin may be needed. **Slough removal:**—The electrodermatome is also in our experience the quickest and least haemorrhagic of methods for the early removal of some sloughs (Fig. 1). In a matter of a few minutes very extensive areas can be cleared. The dermatome can be run over the same area more than once until an unquestionably viable bed is exposed. In some



FIG. 3.—Post-operative photograph of the same case as Fig. 2. Four months after radical excision of ulcer, scarred epithelium, and fibrous tissue. Areas covered with thin split-skin grafts cut by the electrodermatome from the thighs.

tion the superficial layer of epidermis could be easily and quickly removed as thin grafts from those areas of the flaps whose future viability was suspect. These grafts could be stored at 4° C. for subsequent use (leaving the flap to declare itself) or applied at primary operation after excision of the flaps.

3. Other Soft-tissue Injuries and Surgical Problems.

The instrument is of most value where extensive uniform-depth grafts are needed, and especially when it is desirable to save time and limit blood loss. It has therefore a role in any major soft-tissue loss. Its value in the reparative stage of radical mastectomy operation is the ease with which the adjacent trunk skin can be cut to cover residual defects.

4. **Varicose Ulcers.**—Certain extensive varicose and gravitational ulcers, such as the circumferential ulcers depicted in Fig. 2, need a repair by very extensive grafts (Fig. 3) of a skin of reasonable quality. Many of these patients are elderly, for whom it is undesirable to prolong the time of operation. We have used the electrodermatome to provide extensive grafts quickly and of a quality which holds a suture securely.

5. **Lymphoedema.**—In cases chosen for treatment by circumferential excision of skin and fat down to fascia and muscle, the electrodermatome is the most efficient method of first removing skin grafts from the skin of affected areas to be discarded. These grafts can be used to cover the raw areas established by the excision.

6. **Tattoo Marks and Facial Acne.**—The electrodermatome will rapidly efface the design of a tattoo mark (Fig. 4). It may not remove the staining completely if the tattoo is deep, but the result is generally a very effective obscuration of a design which has often long since ceased to please the patient. The instrument has also been used to remove severe and extensive acne of the face.

Summary

Attention is drawn to the value of the electrodermatome, both in general and in plastic surgery.

It is suggested that the expense of this rather costly instrument would be justified for any large surgical service. Our reasons for this belief are the greatly increased ease and speed with which extensive grafts of any thickness may be cut by it with little experience. We believe the instrument represents a further stage in the simplification of graft-cutting techniques, and one that is likely to increase the scope of the reparative work which can be retained in general surgical services.

We have found it of special value in cutting extensive grafts for severe burns, especially when the usual donor sites are not available.

It has also proved a most efficient agent for the removal of burn sloughs from the trunk and limbs.

As a graft-cutting instrument it has a number of other valuable uses, especially in the surgery of trauma.

A new low record for accidents in the mines was established in 1951, according to the annual report of H.M. Chief Inspector of Mines. Persons killed totalled 487, and 1,942 were seriously injured. In comparison with 1950 these were 6 fewer killed and 78 fewer injured. These record figures were attained in spite of the serious disaster at Easington Colliery, in Durham, which caused the death, directly or indirectly, of 83 people.



FIG. 4.—Use of the electrodermatome for removal or obscuration of extensive tattoo designs.

Medical Memorandum

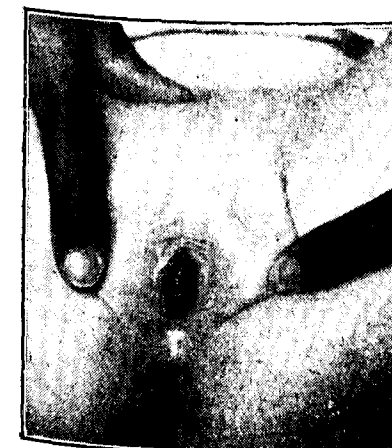
Prolapse of the Urethra in Young Girls

Prolapse of the urethral mucosa in the adult woman is well recognized, but it is not so well appreciated that the condition occurs in young girls. Keefe (1917), in a study of the recorded cases, found that 60% of the patients were children, 28% were women over 40 years of age, and the remaining 12% were between 15 and 40 years of age.

CASE REPORT

A 7-year-old girl was brought to hospital in January, 1952, on account of a blood-stained discharge which soiled her clothes. This "spotting" was of three days' duration and was accompanied by some pain in the urethral region on micturition.

On examination an inflamed ring of tissue surrounding the urethral opening was seen. No other abnormality was found. She was admitted to hospital a few days later. Under general anaesthesia the vulva was more carefully examined. The



Photograph showing inflamed oedematous urethral meatus.

interrupted catgut stitches. Convalescence was uneventful, and the patient was discharged well and free from symptoms on the eleventh day.

Section of the excised tissue showed a covering of transitional epithelium, which was shed in places, over an engorged submucosa containing round-cell infiltration.

AETIOLOGY

The condition may occur at any age. It is reported that the youngest patient was 5 days and the oldest 92 years (Epstein and Strauss, 1937). Hepburn (1920) believes that the supporting structures around the bladder neck are poor in these cases, and that straining produces a partial herniation of the bladder (and urethral mucosa with it) through these poor supporting structures. Certainly the condition has been observed following severe coughing and straining at stool. Keefe (1917) suggests that excessive force by the detrusor muscle of the bladder causes prolapse of a loose mucosa of the urethra. Chute (1925) reported three cases of partial prolapse of the urethral mucosa associated with malignant disease of the bladder and vesical tenesmus. It would appear that, provided the urethral mucosa is only loosely supported, an increased downward pressure, whether supplied by the vesical detrusor muscle or by a raised intra-abdominal pressure, will tend to cause prolapse of the urethral mucosa.

CLINICAL FINDINGS

The chief complaint in these cases is "spotting" of blood on the patient's garments. This results from trauma of the prolapsed mucosa. This may be accompanied by dysuria, which may be severe when the prolapsed mucosa is strangulated, and even give rise to retention of urine. The prolapse

involves the entire circumference of the urethra. The lumen of the urethra is thus completely surrounded by an oedematous and bruised ring of tissue. It is therefore distinguished from the urethral caruncle which involves only a portion of the meatus, usually the posterior lip. A urethral polyp protrudes from the centre of the urethral lumen. A urethrocele produces a swelling through the vagino-urethral septum and is covered by vaginal epithelium. Carcinoma of the urethra may have to be distinguished from the urethral prolapse in the older patient. The carcinoma is indurated and friable, and bleeds easily on examination. In some cases biopsy may be needed to distinguish the one from the other.

TREATMENT

Since vesical tenesmus may be an aetiological factor in the production of the urethral prolapse it would seem to be a wise precaution to exclude any lesion in the bladder by cystoscopic examination. Further, since the prolapsed mucosa is often inflamed (especially when there is strangulation), it follows that the area should be cleaned with sitz baths to reduce infection to a minimum before any cutting operation is carried out.

Simple digital replacement of the mucosa has been advocated, but the chances of recurrence are great. Berry and Greene (1938) record the case of a patient of 10 years who, one year before being seen, had a swelling of the urethral orifice following a fit of coughing. This had been treated by the patient's mother by rest in bed and local applications with apparently a good result. Recurrence occurred with another fit of coughing, when she was seen and treated surgically.

Livermore (1921) favours four-point fulguration of the mass to induce submucosal fibrosis and so bring about reduction of the prolapse. Hepburn (1927) is more radical in his treatment. Since he maintains that there is a partial hernia of the bladder through poor supporting structures around the bladder neck, he pulls up the bladder through a suprapubic approach and attaches it to the back of the pubic bones and anterior abdominal wall. Keefe (1917) is in favour of replacing the prolapsed mucosa and then, through a vaginal incision, shortening the constrictor muscles around the lower end of the urethra.

The remaining methods of treatment involve removing the prolapsed portion of urethra. A catheter has been placed in the urethra and a ligature tied around it and the prolapsed mucosa. This is left until the prolapsed ring of mucosa sloughs off. The ring of mucosa has been amputated with the electric cautery without any suturing, as suggested by Moffett and Banks (1951), or it may be cleanly amputated with the knife and the cut end of the urethra sutured to the cut edge of the meatus as done in the case described above.

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The Heating Appliances (Fireguards) Act came into force on October 1, 1953. The Act makes it an offence for any person to sell or hire (except in certain specified circumstances) an electric or gas fire or an oil-burning heater which is not fitted with a guard conforming to prescribed safety regulations. There are, however, about 4,500,000 such fires, and a further 12,000,000 open solid-fuel fires, already in use in people's homes, to which the Act does not apply, and a large proportion of these are not equipped with adequate guards. Unless their owners provide guards many preventable accidents will still occur. Cotton fabrics and artificial silks are most often involved in burning accidents, and it may soon prove possible to render these materials less inflammable.

Reviews

CONQUESTS OF MEDICINE

Fifty Years of Medicine. By Lord Horder, G.C.V.O., M.D., F.R.C.P. (Pp. 70. 5s.) London: G. Duckworth and Co., Ltd. 1953.

Goethe in *Kunst und Altherthum* wrote of Sir Walter Scott's *Life of Napoleon*:

"What could be more delightful to me, than leisurely and calmly to sit down and listen to the discourse of such a man, while clearly, truly, and with all the skill of a great artist, he recalls to me the incidents on which through life I have meditated, and the influence of which is still daily in operation."

Those members of our profession who have had the privilege of working with Lord Horder or of being his pupils can re-echo these words of Goethe as they open this slim volume, an expanded version of the Harben Lectures which the author delivered at the Royal Institute of Public Health and Hygiene in December, 1952. The book will be equally appreciated and valued by the younger medical men and women who now enjoy the fruits of the conquests in the realm of scientific medicine which Lord Horder and his contemporaries throughout fifty years have achieved.

Lord Horder, like Tennyson's Ulysses, is not only a part of all that he has met, but is also "honoured by cities of men and manners, climates, councils, governments," and "has drunk delight of battle with his peers." Even those who differed from him could not help but recognize the courage with which he has urged his convictions.

Succinctly, and in good English prose, he indirectly narrates his Odyssey in these pages. The first lecture describes "The Birth of Scientific Medicine," and recalls how the lecturer "took the bench to the bedside"—that is, he introduced clinical pathology to the wards. The second lecture, "Medicine Enlarges its Boundaries," treats of the important advances in knowledge of nutrition and food, physical medicine and rehabilitation, industrial medicine, and nursing. In the third lecture, "The Present and the Future" are briefly surveyed, and certain constructive criticisms are made of the National Health Service.

This is a book to keep and treasure for its wisdom and historical value. *Magna est admiratio copiose sapienterque dicentis.*

ARTHUR S. MACNALT.

CIVILIAN HEALTH IN WAR

Medical History of the Second World War: Civilian Health and Medical Services. Edited by Sir Arthur Salusbury MacNalty, K.C.B., M.D., F.R.C.P., F.R.C.S. Volume I: The Ministry of Health Services; Other Civilian Health and Medical Services. (Pp. 441. £2 5s.) London: H.M. Stationery Office. 1953.

This is the sixth volume published so far of the Medical History of the Second World War. Sir Arthur MacNalty, who is the editor-in-chief of the complete work, has edited this volume himself. It deals mainly with England and Wales and the Channel Islands. Volume II of "The Civilian Health and Medical Services" will deal with Scotland, Northern Ireland, and the Colonies, and with the medical services of the Ministry of Pensions.

It is only when the material is presented in one book that the far-reaching effect of the impact of war on a well-organized community can be realized. Established services are disrupted; staff disappear; buildings are requisitioned; new problems arise, and new machinery, devised to meet them, must be produced. The book not only describes the state of the various fields of public health activity at the beginning of the war and what happened to them during the war, but also the steps taken at the end to revive them. Full information is given of the action taken to distribute food. "The rationing provision for children and the priority classes went beyond maintaining pre-war diet and aimed at providing an optimum diet." Credit is given to the British Medical Association for its foresight in compiling in 1937 a

register of doctors so that, when the blow struck, the selection of those to be recruited could be made with least disturbance to civilian needs.

Air-raid shelter problems and the provision made for the welfare of evacuees, refugees, and the homeless are described in detail. No definite conclusion is reached on why we escaped devastating epidemics, though several suggestions are made. At the beginning of the war cerebrospinal fever became more prevalent; there was an increase in the mortality from tuberculosis and in the incidence of scabies; epidemic jaundice became a problem; but venereal disease was kept in check, and the steps to prevent the spread of malaria, typhus fever, and smallpox were successful. Influenza was feared, but never attained epidemic proportions. There was "considerable reduction in the amount of mental disorder during the first two and a half years of the war." There were 151,936 confinements in emergency maternity homes, with a maternal mortality of 0.8 per 1,000, a stillbirth mortality of 19.3, and a neonatal mortality of 9.6 per 1,000. The general conclusion is: "There was little evidence of a lowering of the standard of health during six years of war, and for this no little credit is due to the skill and devotion of insurance medical practitioners."

War tends to stimulate the development of health services. During this war the Public Health Laboratory Service, mass radiography, and special allowances for the tuberculous were started. The diphtheria immunization scheme was pressed, with highly satisfactory results. Authentic information about venereal disease was, for the first time, published in newspapers, and talks were given in the B.B.C. programmes. The Radio Doctor made his debut. The W.V.S. was born.

The invaluable work of the voluntary agencies is described, including that of the American Red Cross Harvard Field Hospital Unit. Mention is made of the Civilian Medical Recruiting Boards, who examined 7,100,409 persons, and the medical work of the Ministries of Health, Education, Labour and National Service, Supply, and War Transport is well described. There is a special chapter on Wales and another on the Channel Islands. The heavy tribulations of the latter are discussed by the medical officers of health of Jersey and Guernsey.

The book is written without any attempt to play on emotion. It is a simple, well-written, and well-documented account of an epic story where everyone did what was expected of him or her, and more.

ALLEN DALEY.

RADIOISOTOPES IN MEDICINE

Radioisotope Techniques: Proceedings of the Isotope Techniques Conference, Oxford, July, 1951, sponsored by the Atomic Energy Research Establishment. Volume I: Medical and Physiological Applications. Ministry of Supply. (Pp. 466; illustrated. £2 10s.) London: H.M. Stationery Office. 1953.

In July, 1951, a conference took place in Oxford on radioisotope techniques as applied to various fields of work. The report of the industrial applications appeared earlier this year, and that of the medical and physiological applications has now been published. This report consists of the full texts of the 70-odd papers that were presented in these sections, together with a note of the discussion on each; and even now, two years after the conference, it is a useful survey of this field of work. This is perhaps explained by the international, yet very informal, nature of the conference, where the preliminary results of a large number of laboratories were fully described and discussed.

The papers are about equally divided between medical diagnostic and therapeutic applications of the radioisotopes, and work on intermediary metabolism and the distribution of materials within the tissues. On these subjects the report is as valuable as the conference was, for it collates work from many different centres, yet with surprisingly little overlap between the various papers on similar subjects. Inevitably, the long interval between the conference and publication of its proceedings robs the book of some of its value, but it remains a most important record of a fertile

conference and a representative "cross-section" of the biological investigations to which radioisotopes are applicable. Even now there are few books on this rather forbidding subject that offer such a mine of important information as does this one. Its editing and preparation by unnamed members of the Harwell staff are as excellent, and must have been as laborious, as their preparations for the conference itself. That is saying a great deal, and it as much deserves our gratitude.

E. ERIC POCHIN.

FOOD HYGIENE

Food Hygiene Handbook. By W. Clunie Harvey, M.D., D.P.H., F.R.San.I., and H. A. Perry, F.R.San.I., M.S.I.A. Foreword by Sir William Savage, M.D. (Pp. 159; 34 illustrations. 15s.) London: Heywood and Co. 1953.

A century of strenuous effort in relation to environmental conditions has eliminated most of the serious dangers to the public health. One of the major defects remaining in this field is faulty food-handling, which is rife in Britain. Hygiene in the manufacture, storage, sale, and serving of food is far too often appallingly poor. The number and severity of food-poisoning outbreaks and the high incidence of the dysenteries are cogent evidence of the existence of conditions apt to be ignored because they are largely hidden. This book deals most effectively with the problems and gives the answers. It is intended as a practical guide for the keepers of shops, restaurants, and hotels and for canteen supervisors and housewives. But general practitioners, medical officers of health, and sanitary inspectors will find here much to interest and stimulate them.

The authors carefully and succinctly summarize the law relating to food hygiene and succeed in making legal reading much less painful than usual. Food-poisoning and the provision and equipment of food premises are subjects adequately considered, and people concerned with individual food trades will find their peculiar difficulties discussed, together with guidance for their solution. The food trade and local authorities have still much to do, but so also has the housewife. The results of care before delivery can easily be undone by carelessness in the home. The authors have laid down clearly and shortly a series of rules which the housewife would be well advised to follow in the interests of her family. There is a valuable section on the infestation of food premises and how to destroy the insects concerned. Many of the excellent illustrations are devoted to these creatures and will help in their identification. At the back of the book there are advertisements of food equipment and materials used in food control. They are relevant to the subject-matter, but I feel that, much as I like this publication, I should have liked it more without them.

This book is commended to everyone concerned directly or remotely with the control of food; and the more widely it is read the greater will be the improvement in food hygiene.

C. METCALFE BROWN.

NEUROSYPHILIS

Clinique et Pathologie de la Neurosyphilis. By Professor J. Alves Garcia. (Pp. 160; 36 figures. No price given.) Paris: Masson et Cie. 1953.

The modern treatment of syphilis has so profoundly transmuted its characteristics that the florid manifestations of the disease are becoming less common and the signs of neurosyphilis less obvious. Nowadays cases seldom correspond to the classical descriptions, and the forms of neurosyphilis, which twenty or thirty years ago were so rich and varied, have been considerably modified by modern therapy. During this transitional period in the history of syphilis the author has had the advantage of observing this metamorphosis as professor of psychiatry and physician to the Hospital for Neurosyphilis at Rio de Janeiro, where extensive clinical material has been at his disposal for some twenty years. His readable monograph on the clinical and pathological aspects of neurosyphilis records the results of his accumulated clinical

experiences and histopathological investigations, which he hopes will stimulate further research into the newer pathological concepts.

Without being exhaustive or so statistical as to be monotonous, the earlier chapters are complete essays on the various clinical types of neurosyphilis and their pathology. Later chapters are on the pathology and histopathology of parenchymatous syphilis, some original researches on malarial therapy and the irreversibility of its vascular lesions, optic atrophy, congenital neurosyphilis, and a final chapter on treatment.

The many divergencies of opinion on the possibility of dualistic strains of *Treponema pallidum* are fully discussed. The supporters quote the rarity of cerebral syphilis among the American negroes, the Chinese, the Persians, and the natives of Central Africa. But other provocative factors must be recognized such as fatigue, intellectual strain, and alcoholism. Possibly when the virus is not sterilized by energetic treatment it acquires new characteristics and becomes neurotropic. Moreover, modern treatment may have provoked biological alterations in the spirochaete to render it neurotropic rather than dermatotropic. Meanwhile, modern research seems to have discarded the thesis of a neurotropic strain of spirochaete.

The author says that malaria therapy for G.P.I. has not been surpassed by any other method of treatment, and penicillin has not had the success which might have been expected. He considers penicillin insufficient treatment for the pure forms of parenchymatous syphilis and would administer it only as an adjuvant in those cases showing intense cellular reaction in the cerebrospinal fluid. He is an advocate of malaria therapy, preferably with malignant tertian in Brazil, for both tabes and G.P.I., and follows it immediately with arsenic and liposoluble bismuth. But he would absolutely forbid the use of all quinquivalent arsenicals in the presence of optic atrophy. These are strong words, coming as they do from a hospital where, during the ten years 1942-52, most of the admissions (62%) were cases of G.P.I.

The author stimulatingly declares that there are no mental symptoms which are specific of syphilis, not even in G.P.I., and provokingly asks why this same condition provides such a variety of symptoms when the anatomical lesions are so invariably the same. And, since they are so uniform, why are the clinical symptoms not equally so? Again, although G.P.I. is generally considered to be non-infectious, he remarks that the blood from such a patient can cause typical granulomatous lesions when inoculated into a laboratory animal. Such numerous incidental observations scattered throughout the book make it well worth reading, for they are the plums from a unique experience and the personal hallmarks of a master of his subject.

T. ANWYL-DAVIES.

A Catalogue of Engraved Portraits in the Royal College of Physicians of London, by A. H. Driver, has been published by the College, price £2. In the preface reference is made to previous work by the late Dr. Arnold Chaplin. He devoted many years to the task of building up and describing the collection, and his catalogue forms the basis of the work now published. The biographical data included in the present catalogue show evidence of considerable knowledge of medical history and bibliography, and it would have been more accurate to concede its authorship to Dr. Chaplin and its revision to Mr. Driver. The College now possesses some 4,500 prints, including the large collection given by Chaplin in 1934, and this printed catalogue marks an important step forward in the documentation of such material. Besides dates and brief biographical notes of the subjects, information given on each portrait includes size, painter, and engraver. There is also an alphabetical list of engravers. We must now look forward to the time when catalogues of the comparable collections at the Royal College of Surgeons and the Royal Society of Medicine and the much larger collection in the Wellcome Historical Medical Museum can be published. Equally valuable would be a printed version of the magnificent catalogue of all known engraved portraits of British medical men, compiled some years ago by Chaplin, Herbert Bruen, and W. J. Bishop, which at present exists only in typescript copies at the Royal College of Physicians, the Royal College of Surgeons, the Royal Society of Medicine, and the Print Room at the British Museum.

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RESPONSIBILITY FOR MURDER

The most far-reaching of the conclusions suggested by the Royal Commission on Capital Punishment¹ will probably prove to be those on the M'Naghten Rules, for of the Commission's leading recommendations, summarized at page 775 of the *Journal*, these are the most likely to be accepted in something like their present form. They are largely in accord with the medical evidence presented by the B.M.A. and by the Institute of Psycho-analysis, as well as with that of some, though by no means all, individual medical men who gave evidence. They will have, too, some legal support, and public opinion is unlikely to cavil at them.

In brief, the Commission (with some dissentients) concludes that the Rules should be either amended or abrogated. If amended, they should be enlarged with some such phrase as that suggested by the B.M.A.,² so that there would be added to them the test whether the accused was labouring, as a result of disease of the mind, under "a disorder of emotion such that, while appreciating the nature and quality of the act, and that it was wrong, he did not possess sufficient power to prevent himself from committing it." If the Rules are to be abrogated—and the Commission would prefer that—then the jury would have no formula put before it, but would determine, in view of all the evidence, whether at the time of the act the accused was suffering from disease of the mind to such a degree that he ought not to be held responsible. In either case mental deficiency no less than disease of the mind is held to be a possible cause of irresponsibility.

The chief reason why the Commission would have the M'Naghten Rules altered is because they take into account only the cognitive faculties, which is the main criticism the medical profession has made of them—and began making almost as soon as they were formulated over 100 years ago. But the phrase "irresistible impulse" which was so often on the lips of reformers is open to objections also. In the first place, its critics would ask, how is an irresistible impulse to be distinguished from one that is unresisted? An objection perhaps more telling to the medical mind is that

it gives a false picture of the mentality of some people arraigned before the courts. Often it was not some overwhelming wave of passion, with an implication of transience, that guided a criminal's conduct so much as a long-continued mental state. Commonly such a condition could be classified as paranoia. This and other mental disorders are often enough accompanied by sufficient clarity of intellect to enable the accused person to know the nature and quality of his act and that it was legally wrong, yet it may be questioned whether any accused thus afflicted has been hanged in recent years. Some have been reprieved by the Home Secretary after a medical investigation, while others have been found "Guilty but insane" under the M'Naghten Rules. This has been possible only because of the considerable latitude with which they have been interpreted. As that great lawyer, Viscount Simon, expressed it in an address published in the *Journal* recently³: "Judges and juries are impressed by really strong medical evidence of irresponsibility, and the legal formula is not of cast-iron, but allows of elastic application." It is this elasticity of interpretation that has been invoked both by those who would retain the Rules and by those who would replace them; for, argue the first, rules of some kind are necessary, and a humane application of them has made them work in practice; while the second contend that rules with which such liberties have to be taken to conform to public opinion of the day are better scrapped altogether. The Commission has taken the second view, and there is much to be said for it. Whether it would prove workable in practice is another matter. An extension of the Rules may be preferred, and in that case medical opinion would seem to be well met by the Commission's suggestion of adding to the formula a phrase to the effect that the accused, as a result of disease of the mind (or mental deficiency), "was incapable of preventing himself from committing" the act.

But whatever of the suggested modifications is made to the M'Naghten Rules the formula is bound, so long as it is retained, to have the defect of any formula applied to the infinite variety of human experience. In attempting to distinguish between the responsible and the irresponsible, judges and juries are likely to be harassed by those puzzling cases in the borderland where reason glows dimly but is not extinct. With this in mind the B.M.A. included in its evidence a recommendation that a verdict of "guilty with diminished responsibility" should be returnable in suitable cases in the English courts as it is in the Scottish. The Commission was unable to agree. Its main objection is against trying to take a doctrine that has grown up gradually in the common law of Scotland and inject it in one dose into

the English law; but, recognizing that some alteration in the present state of things may be necessary, the Commission embarks on the highly controversial argument that the jury should have the power of deciding whether the prisoner should hang or whether mitigating circumstances demand a lesser sentence. We pass here beyond the borders of medicine into those many other problems that the Commission sets before us on which a doctor's opinion will owe less to his medical training than to his private judgment.

Among the recommendations of special interest to medical men is one that has achieved some considerable publicity—namely, that on execution by injection of a lethal drug. While the Committee does not recommend lethal injection "in present circumstances," it does recommend, "unanimously and emphatically," that it should be considered periodically. Here most medical men will feel that the Commission has gone rather astray. Whatever may be said for or against various procedures for causing death speedily and humanely, the Commission does not touch on what to practising doctors must be one of the strongest arguments against lethal injections. It is that the injection of a drug is a procedure that was invented and has always been used wholly for beneficial purposes, and it is so regarded in the public mind. To execute criminals by the same procedure as brings ease and sleep to sufferers from pain must surely arouse, even if unconsciously, feelings of abhorrence in many people. No emphasis is needed to the evidence put before the Commission by the B.M.A. that no medical man would be associated with the giving of lethal injections or the training of other people to give them.

ANTIBIOTICS IN WHOOPING-COUGH

The unusually high number of whooping-cough cases being reported in England and Wales each week is illustrated graphically in our epidemiological columns. It remains a serious disease, especially in very young children, and unfortunately antibiotics offer no dramatic benefits. *Haemophilus pertussis* is highly susceptible *in vitro* to the action of the newer antibiotics, yet their efficacy in the treatment of the disease is still uncertain. This is perhaps not surprising in view of the fact that, in the untreated disease, *H. pertussis* disappears early from the clinical picture, though symptoms persist and often increase for several weeks after it can no longer be detected. Perhaps *H. pertussis* induces an altered state of the tissues which is responsible for the symptoms, and once this state is induced the presence or absence of the organism is of little account. A drug whose only action is to inhibit *H. pertussis* could

not be expected to alter the course of the disease unless it were applied before the tissue reaction had been induced. While this is no more than conjecture, something of the sort may explain the discrepancy between clinical and laboratory results.

A report¹ published by the Whooping-Cough Subcommittee of the Antibiotics Clinical Trials Committee of the Medical Research Council analysed the results of treatment with chloramphenicol, aureomycin, and an inert control preparation in 294 patients. Children aged 0–11 months were given 1 g. daily in two doses, children aged 12–35 months 1.5 g. daily, and children aged 36–59 months 2 g. daily, in each case for seven days. The effect of the treatment was judged by the frequency and severity of the spasms and by the culturing of per-nasal swabs. The bacteriological evidence was clear: treated cases cleared more rapidly than controls. Clinical effects were much less striking, and it was mainly in cases treated within eight days of the onset of the earliest symptoms that any significant difference was found. The report emphasizes that these earliest symptoms are cough or coryza, not the development of a paroxysmal cough, which for this purpose must be regarded as appearing at a relatively late stage of the disease. It is also clear from the report that even in the early group results of treatment were not dramatic: indeed, most of the children were still having typical spasms three weeks after the start of treatment. The drugs appeared to diminish the severity of the paroxysms to a greater degree than their number. But in cases treated later than eight days after the onset of symptoms the difference in number and severity of paroxysms between treated and control groups was very slight, though always in favour of the treated group. As the report states, if attention had been directed to a comparison between the whole of the treated and of the control groups, it would have been concluded that chemotherapy failed to produce a clear-cut clinical cure.

Gray,² commenting on the report, criticized a dosage scheme based on age rather than tissue mass. He worked out the equivalent doses per kg. body weight: these range from 50 mg. to 75 mg. per kg. It is quite possible that such doses are not high enough, but they are not unreasonably low. Gray then quoted some figures of chloramphenicol concentrations in post-mortem lung and brain tissues showing that concentrations of the drug vary from tissue to tissue, that vascular obstruction coincides with low concentration, and that in uninflamed human

¹ *Lancet*, 1953, 1, 1109.² Gray, J. D., *ibid.*, 1953, 1, 1257.³ *ibid.*, 1950, 2, 800.⁴ LaBocchetta, A. C., and Dawson, K. E., *Amer. J. Dis. Child.*, 1952, 84, 184.⁵ Lassen, H. C. A., and Grandjean, L. C., *Lancet*, 1951, 1, 763.⁶ Hazen, L. N., *et al.*, *J. Pediatr.*, 1951, 39, 1.⁷ Booher, C. E., *et al.*, *ibid.*, 1951, 38, 411.⁸ Bogdan, A., *Lancet*, 1951, 1, 764.⁹ *British Medical Journal*, 1952, 2, 136.¹ Report of Royal Commission on Capital Punishment, 1949–53. 1953. H.M.S.O. 12s. 6d.² *British Medical Journal*, 1950, 1, 365.³ *Ibid.*, 1953, 2, 1.

lung chloramphenicol is rapidly removed. These are points of considerable importance, suggesting that different dosage may be required at different stages of the disease, but whether they can be translated into a practical dosage scheme is another matter. In an earlier paper Gray³ investigated the use of aureomycin and chloramphenicol in the treatment of whooping-cough: for aureomycin the dosage was 50 mg. per kg. per day in four doses, for chloramphenicol 100 mg. per kg. per day in one dose, in both cases for a total of five days. He found that both drugs reduced the number of coughs, but that chloramphenicol also lessened the whooping and vomiting and loosened the cough. His results showed no dramatic change in the course of the disease: children were still having paroxysms three weeks after the onset of the disease, but the number of paroxysms was less than in the controls. He suggested a higher dosage scheme.

Other workers have had similar experiences. La-Bocchetta,⁴ using aureomycin in a dosage of 50 mg. per kg. body weight for ten days, concluded that, except in cases treated in the first week of the disease, there was no marked apparent effect from the use of the drug. Lassen⁵ treated 93 cases with chloramphenicol, given as rectal suppositories for three to five days, and claimed that the frequency of the paroxysms fell sharply. No untreated controls are reported for comparison, and patients were still having paroxysms at the end of the period of observation, though fewer in number. Hazen⁶ and Booher⁷ used terramycin as well as the other two drugs, and it appears to have a similar degree of efficacy. Bogdan⁸ used chloramphenicol to treat contacts, and his results are striking: in 10 out of 13 cases the disease was arrested in the pre-paroxysmal stage. The treated contacts must be isolated from infectious cases to avoid reinfection.

It is clear that no drug has yet been discovered which will rapidly control an attack of whooping-cough. Aureomycin, chloramphenicol, and terramycin probably all have some effect if given in the earliest stages, but the effect is far from dramatic. When given later in the disease they have very little effect. These drugs have toxic effects—most notably chloramphenicol⁹—and it is inadvisable to prescribe them in every case. The minimal dosage is 50 mg. per kg. body weight per day, and 75 or 100 mg. per kg. may be better given in three or four doses per 24 hours for seven days. Because babies under 1 year suffer most severely from the disease, it is justifiable to treat all patients of that age. All cases diagnosed within a week of the first symptom—not the first spasm—might also be treated. Even in these cases dramatic results should not be expected. Probably the most rational use of the drugs is in the treatment of contacts before they develop the typical symptoms of the disease.

SEVERE REACTIONS TO PENICILLIN

It has long been recognized that sensitivity to penicillin may develop, certainly in consequence of treatment and possibly in other ways. Some of the penicillin in the blood is bound to plasma proteins, and it therefore evidently behaves as a haptene. As long ago as 1945 A. Rostenberg and H. Welch¹ found 5% of subjects to be sensitive as determined by intradermal tests. S. M. Peck and his colleagues² found this condition in 5.4% of 499 subjects, and in a higher proportion of those who had been treated with penicillin. These authors and R. Schuppli,³ who observed a marked increase in the frequency of sensitivity between 1947 and 1951, also consider that skin mycoses predispose to it; whether antigenic relationships or simply an allergic diathesis are responsible for this seems uncertain. The usual effects of giving penicillin to such a patient in these earlier times were fever and urticaria.

More recently much more alarming and even fatal reactions have been described. Following the paper by F. J. Pick and J. F. Patterson⁴ recently published in this *Journal* describing a fatal reaction to a penicillin injection, and the report in our medico-legal columns⁵ of an inquest on a similar case, we have had several letters, some which appear in our correspondence columns this week, describing similarly alarming but fortunately non-fatal reactions. Experiences of this kind, although apparently new, are by no means unique: Bayer and five colleagues,⁶ writing from Illinois, describe six such occurrences, one being fatal, and are puzzled that so little has been written on this subject "in view of the ease with which this series was collected in a short period." Since there appears to have been nothing unusual in their methods of giving the drug, such reactions cannot be very uncommon, and it is important to know how to prevent them.

In the first place, suction before injection should always be practised in order to ensure that what is intended to be an intramuscular injection is not in fact intravenous. The subcutaneous route is perhaps preferable on this account, since the likelihood of entering a vein is then remote. Intravenous sodium penicillin is harmless in a normal subject, but penicillin in some of its present forms is not. If the preparation contains oil, or procaine penicillin crystals in suspension, these are at least liable to obstruct lung capillaries, while some of the more complex penicillin compounds, including that used by Pick and Patterson, are suspected of exerting an actually toxic effect when accidentally injected intravenously.

This is certainly not the explanation of every such reaction, since one in the series of Bayer and his colleagues resulted from nothing more than the intradermal injection of 10 units of crystalline penicillin as a test of sensitivity. The other factor is unquestionably sensitization: such patients always give a history of previous penicillin treatment, and often of previous reactions of some kind. The fact that they have been sensitized can

¹ *Amer. J. med. Sci.*, 1945, **210**, 158.

² *J. Amer. med. Ass.*, 1948, **138**, 63.

³ *Schweiz. med. Wschr.*, 1951, **81**, 589.

⁴ *British Medical Journal*, 1953, **2**, 605.

⁵ *Ibid.*, 1953, **2**, 446.

⁶ *J. Amer. med. Ass.*, 1953, **151**, 351.

⁷ *Arch. Derm. Syph. (Chicago)*, 1950, **62**, 314.

be proved by the intradermal injection of a small dose, the usual result of which is immediate wheal formation. The time has apparently come when at least some cursory inquiry about previous reactions should be made before giving any patient penicillin: a test for sensitivity should follow if the history is suspicious. Patients having asthma or other allergic conditions should evidently be treated with caution. The administration of an antihistamine compound with the penicillin itself, according to S. W. Simon and M. D. Feldman,⁷ serves to prevent the ordinary type of hypersensitivity reaction, and would presumably have a similar effect on the more severe. Drugs of this type are also apparently at least as useful as adrenaline for the treatment of the established reaction.

It would be most unfortunate if, as one of our correspondents seems to suggest, this development tempts doctors to abandon penicillin for one of the newer antibiotics. Penicillin has properties possessed by no other drug, and what is chiefly required is greater discrimination in its use.

CULTIVATION OF THE COMMON COLD VIRUS

At the end of the last war the Harvard Hospital at Salisbury, originally designed and shipped to the United Kingdom for the study of infectious disease arising in the European theatre of operations, was most generously handed over by Harvard University to the British Government for the study of problems in preventive medicine. For the last seven years it has been the centre of research into that most common of all human afflictions, the common cold. The starting line for this enterprising project was acceptance of the belief that the primary aetiological agent of the common cold was a virus. Dochez¹ had shown this to be so more than twenty years ago, and it has since been confirmed on numerous occasions by Andrewes and his colleagues at Salisbury.² Having accepted this fact, research workers had as their first and main objective to catch the virus and study it under laboratory conditions. It may seem strange that a virus which is capable of causing such universal and indiscriminate disease in man should be so difficult to adapt to laboratory life. But so it has been. Despite innumerable attempts, aided by all the tricks of the trade, the common cold virus has, with the exception of Dochez's success with chimpanzees, resisted all the efforts made to cultivate it outside the human host.³ How then could this objective be reached? The successful adaptation of poliomyelitis viruses to tissue culture of human embryonic material pointed to a new line of attack on other viruses pathogenic to man.⁴

Earlier experiments with the common cold suggested that the virus at least survived in human embryonic tissues. Now with improved technique Andrewes and his team present evidence that actual virus multiplication has taken place.⁵ Using the roller-tube technique with explants of human embryonic lung and a single strain

of virus, they have brought on colds in human volunteers by intranasal inoculation with material up to and including the tenth serial passage. Some intermediate passages have been negative, but colds artificially induced do not always "take." Controls, however, have been clearly negative. The repeated dilution that has necessarily taken place on passage suggests that the colds produced at the tenth passage have been caused by fresh virus rather than by any virus remaining from the original inoculum.

Human volunteers have so far played an indispensable part in this work as indicators of the presence of virus in test material. The second objective will therefore be to find some method of identifying the presence of virus without recourse to human beings. Cytopathogenic effects, a noticeable feature in poliomyelitis tissue cultures, have so far not been observed in the case of the common cold. More detailed microscopical examination and immunological tests may provide a way of overcoming this obstacle. It seems clear that further calls will be made for human embryonic material in modern virology. For understandable reasons, supplies of such material in this country will fall short of demand, and so it is important that the fullest possible use is made of any material that is available until such time as a more convenient medium can be found.

OCCUPATIONAL FERTILITY

The last part of the Registrar-General's 1931 Decennial Supplement¹ has just appeared; it is mainly on occupational fertility. The crude birth rate per 1,000 married males aged under 55 in 1931 was, for all classes combined, 95.9. The crude birth rates of social classes I to V expressed as percentages of that for all classes were, respectively, 75.1, 67.6, 99.4, 110.4, and 127.4. There were fluctuations within the social classes, and the most remarkable for occupational groups with 1,000 married men or more was that of company directors (so returned) in finance and insurance in social class I, who had a ratio of 277.9. This ratio was much the largest recorded. After that the other ranks of the Services had the highest birth rates, the percentage ratios of their birth rates to the rate for all classes being 228.2 for the Royal Air Force, 213.7 for the Army, and 194.9 for the Royal Navy and Marines. The ratios for the Merchant Navy were much the same, being 204.5 for petty officers, seamen, and deck hands, 203.6 for pursers, stewards, and domestic staff, and 202.6 for firemen, trimmers, greasers, and donkeymen. The largest ratios among civilian occupations were greengrocery salesmen and shop assistants 190.6, other assistants to furnacemen and rollers 190.0, builders' labourers 184.7, haulage and cartage contractors, managers, and master carmen 174.2, slaters and tilers 166.5, tube drawers and welders 161.4, motor mechanics (so returned) 159.0, constructional engineers (not professional) 152.0, other dock workers 149.5, miners, other workers below ground 148.6, miners, hewers, and getters 147.2. The lowest ratios were those of metal workers, foremen, and overlookers in machine shops 12.7, and heads or managers of commercial

¹ Registrar-General's Decennial Supplement, England and Wales. 1931. Part IIB, Occupational Fertility, 1931 and 1939.

¹ *J. exp. Med.*, 1930, **52**, 701.

² *Lancet*, 1949, **1**, 71.

³ Andrewes, C. H., *New Engl. J. Med.*, 1950, **242**, 235.

⁴ *British Medical Journal*, 1953, **1**, 826.

⁵ *Lancet*, 1953, **2**, 546.

offices 17.0. Generally the group of foremen and over-lookers had a very low ratio, and in nineteen types of occupations with 1,000 or more married men aged under 55 the ratios varied between 20 and 40. Other very low ratios were lodging- and boarding-house keepers 19.8 and chief constables, inspectors, and superintendents of police 22.1.

Most of these differences are not so much occupational as due to age, for a parent has commonly founded and perhaps reared his family before attaining a position of responsibility. The difference between the younger and older men can be readily demonstrated with railway workers. In the period round 1931 the locomotive engine fireman had to serve several years before promotion to engine driver, and during his spell of firing he married and started a family. In 1931 the ratio of the crude birth rate to that of all occupations was 143.9 for firemen and only 44.2 for engine drivers.

A comparison has been made between the relative fertilities of married men aged under 55 and their wives aged under 45. The index for each sex was found by expressing the birth rate for each population group as a percentage of the rate for all classes combined. The index for each sex was in very close agreement, and generally differences of 5 or less were recorded. But fishermen were an exception, for the married men had a birth rate in 1931 of 79.0% of all males, while the married women had a rate of 139.7% of all married women.

Some data for 1939 included in this volume were analysed by thirteen occupational groups. The wives of miners had the lowest average age at marriage of 23.3 years, the lowest at first maternity of 25.1 years, and the shortest average duration between marriage and first maternity of 1.8 years. On the average the wives of professional and administrative workers married at 25.9 years, and had their first child at age 28.6 after a marriage duration of 2.7 years. The wives of miners had the highest stillbirth rate, while the professional classes had the lowest.

Twenty-two and a half years have passed between the 1931 Census and the publication of this volume, though the inclusion of information collected in 1939 is some compensation. Doctors and others who are interested in such information as the Registrar-General publishes here would be better served if it concerned contemporary rather than historical events, and many will hope that the results of the 1951 Census will not be so delayed.

PREVENTION OF FOOT DEFECTS

In an ageing population there is bound to be a steady rise in the incidence of disabilities due primarily to wear and tear. This applies especially to foot defects, which have become a serious medical problem. It is economically impracticable, even if it were possible, to provide effective treatment for all those with established foot defects, and under the National Health Service it has been considered an economic impossibility to provide chiropodial treatment for all, because the demand would be so great. A close analogy may be drawn between the foot and the motor-car. Although cars of varying

quality are produced, they are all capable of giving good service provided that they receive careful maintenance. The need for specially equipped repair shops is in inverse proportion to the care with which cars are serviced. The same applies to the human foot, but so far we have concentrated on providing expensive specialist services and elaborate equipment for the repair of broken-down feet, when what is required is an organization for their care and maintenance, especially during the running-in period—that is to say, during childhood. One factor that has delayed the development of such services is the lack of factual information about the incidence, aetiology, and mode of development of the various types of foot defects. As a result of recent surveys, however, the general picture is becoming much clearer. The information afforded by the survey¹ conducted in the borough of Luton on the incidence of foot ailments at all ages among the general population has now been reinforced by two further surveys whose results are published in this issue of the *Journal* (pp. 745 and 749). The conclusions that may be drawn from these and other investigations should be of assistance in the planning of preventive measures.

Perhaps the most important point brought out by all investigations is the fact that the majority of those defects which are responsible for the more serious disabilities of later life are already well established by late adolescence. A second fact of almost equal significance is that, although a foot may have a congenital weakness rendering it liable to develop some particular defect, whether it does so or not depends primarily upon the care it receives during childhood and adolescence, with special emphasis on footwear. An obstacle to the comprehensive organization of preventive measures lies in the multiplicity of the various interests involved, from the public health and school authorities on the one hand—with their teams of workers comprising doctors, health visitors, school nurses, physiotherapists, and chiropodists—to the shoe manufacturers and retailers on the other. Finally, there is the fact that the foot is a complicated piece of mechanism demanding knowledge and understanding for its proper care. Before real progress can be made much closer co-operation is needed between the diverse interests concerned, and a better and more general understanding of the problems. The Boot and Shoe and Allied Trades Research Association and the Foot Health Educational Bureau have already done much good work on these lines. Now that the latter has been taken under the wing of the Central Council for Health Education it is to be hoped that it will have the opportunity for increasing the scope of its work still further. The fruits of co-operation are already evident in the plans for a "foot health week" to be held in Birmingham later this month under the aegis of the Foot Health Educational Bureau and the Birmingham health and education departments.

Further knowledge could now best be gained by conducting pilot experiments in foot care in various parts of the country. A provisional pattern for such experiments has already been worked out, the essential features comprising the regular inspection of the feet of school-

¹ Dykes, R. M., Grundy, F., and Lee, H. E., *Med. Offr.*, 1952, **87**, 223 and 235.

children, the assessment of the significance of any defects noticed by those with the requisite training and experience, advice and regular supervision in the matter of footwear, and arrangements for special treatment in selected cases. Fortunately, for once, the requirements do not entail great expense on elaborate equipment, buildings, or staff. Although local health and education authorities already have their hands full with other urgent tasks, it is very much to be hoped that more of them will take the initiative in helping with this important aspect of preventive medicine.

QUALITY IN GENERAL PRACTICE

It might be thought that a good postgraduate grounding in clinical medicine would be apt to make a man pre-eminently suited to general practice. But the difficulties experienced by many holders of higher qualifications, and especially the M.R.C.P., in entering general practice suggest that there are at least some established doctors who do not share this view. Another aspect of this problem was discussed in the General Medical Services Committee of the B.M.A. last year,¹ when Mr. R. M. Forrester, chairman of the Registrars Group Council, put before the committee the anxieties and needs of registrars for whom no consultant openings would be made. He received the sympathetic hearing that his case deserved. But while the problem was rather a different one with its own special urgency then, its discussion served to throw light on the more general question whether postgraduate study is in fact the asset it is sometimes claimed on paper to be when a doctor seeks an entry into general practice. Several speakers expressed the view—and no one can cavil at it—that a doctor, however well qualified in medicine, must begin at the beginning when he starts in general practice, and not expect to become immediately a principal in a large practice ready-made for him. Nor, indeed, is he likely to get far if he enters general practice with an air of doing so as a last resort and with an expectation of obtaining part-time hospital work straight away. Those responsible for his appointment to a vacancy, whether as assistant or principal, may well take care to assure themselves that he intends to devote his whole energy to general practice. But when allowance is made for those few registrars who take no heed of such criteria as these, there remain many who believe that they have been turned down for no other reason than that they have done several years of postgraduate medical work in hospital and achieved a higher qualification. In a letter at page 161 of the *Supplement* this week a correspondent draws attention to the plight of some of these people. Whatever may be said for or against his specific cases, there is more than a grain of truth in the jocular remark—which came from a good source—that to the applicant for a general-practice vacancy the possession of a car is more important than the possession of an M.R.C.O.G., F.R.C.S., or—most dangerous encumbrance—M.R.C.P.

While there is an obvious truth in the assertion—and it has needed emphasis recently—that general practice is

a special branch of medicine, there is the danger too that the hypnotic reiteration of a catch-phrase may obscure the fact that the greater part of general practice is still clinical medicine. It may gather tributaries from other springs of knowledge, but surely a thorough foundation in ordinary general medicine to the M.R.C.P. standard can be nothing but an asset. And so it is held to be for even the much more restricted medical specialties, such as, for instance, anaesthesia or dermatology, many of whose consultants have a higher postgraduate qualification in general medicine. There are already far too many barriers to free and easy movement in the Health Service. Most of them are inherent in its administrative structure, and doctors have rightly condemned them many times. It would be deplorable if a few but influential people in our own profession should heap up more barriers, and ones peculiarly harmful to that lively spirit now to be seen animating general practice in many quarters.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

One of the facilities general practitioners have been seeking for some time is easier access to pathological investigations, though one may note as a corrective to this that in the G.P. Review Committee's report¹ some 50% of general practitioners did not think their practices suffered from the absence of such facilities. Nevertheless it is difficult to see how general practitioners can do what one witness in the inquiry¹ described as "good medicine" unless he has at his disposal the exact information and guidance a clinical pathologist can give him. General practitioners will want to know just what facilities are available, how they may make use of them, and how they may interpret the findings of the laboratory so as to use them for the benefit of their patients. It is for this reason that we are publishing over the next few months a series of articles on "Clinical Pathology in General Practice," the first of which, by Professor S. P. Bedson on "Facilities under the National Health Service," appears at page 774. Future articles will be on such subjects as the method of collecting specimens, technique of venepuncture and lumbar puncture, taking specimens for medico-legal purposes, and on the value of various tests and investigations in the diagnosis of disease. Throughout it is hoped to give the normal values of various bodily constituents so that the practitioner may constantly have these by him; and the writers in this series will discuss the significance to be attached to variations from the normal. As Professor Bedson puts it: "The important thing is that the general practitioner should consult with the pathologist about his case, for only in that way will he get full value from this service." Such a consultation should be of the highest interest to both, for it will bring the pathologist into more direct contact with the everyday problems of practical medicine and give the practitioner a more exact idea of the help the science can give the art. And the patient will benefit. It is hoped that the present series will make such co-operation fruitful.

¹ *British Medical Journal Supplement*, July 26, 1952, p. 77.

¹ *British Medical Journal*, September 26, 1953.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

FACILITIES UNDER THE NATIONAL HEALTH SERVICE

BY

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This century has seen enormous progress in the application of pathology to the elucidation of clinical problems. Fifty years ago the pursuit of pathology was largely academic. It was, of course, recognized as being fundamental to the science of medicine, and morbid anatomy and histology were used to a limited extent for the purpose of solving clinical problems in retrospect. But a diagnostic service of hospital pathology such as we have to-day, in which microbiology, biochemistry, and haematology take their place with the more ancient discipline of histopathology, had hardly been conceived. By the outbreak of the second world war the teaching hospitals and the larger voluntary hospitals had built up departments of pathology which not only provided a diagnostic service but served also in many instances, and particularly in the case of the teaching hospitals, as active centres of research. But this was not the case in many municipal or small voluntary hospitals which at that time either lacked completely, or were ill supplied with, such an essential aid in the treatment of their patients. And nothing had been done to supply the wants of the general practitioner in this respect, if one excludes one or two commercial or local authority ventures which in the main provided a limited postal pathology service of a most undesirable kind.

The consequences of war are not invariably evil, and one of the good things achieved by the recent war was the raising of the standard of medicine in the more isolated and less advanced hospitals of this country. This was the outcome of the Emergency Medical Service with its transfer of staff, equipment, and ideas from the efficient hospitals of our large cities to the more lowly and sometimes rather primitive institutions in the less congested parts of the country. Upgrading these hospitals was not merely a question of implanting in them a leaven of good clinicians; all the other services had to be installed or improved, and that meant setting up adequate departments of pathology, because, as all are agreed, a good service in pathology is essential to a high standard of achievement in medicine. And when in 1948 the National Health Service came into being it was very largely on the pattern evolved during the war that the service was fashioned, at any rate so far as pathology was concerned. There was, however, this difference, and a very important one at that: the pathology service envisaged by the designers of the health service was to be just as readily available to general practitioners as to the clinical staff of the hospitals.

One ought, perhaps, to say that the general practitioners did at times make use of the Emergency Laboratory Service, and in this they were not discouraged either by the local authorities or by the Ministry—in fact, in some parts of the country the service was thrown open to them. For example, the county laboratory service with which I was associated in the

war was made freely available to the practitioners, and very popular it proved. But this is a different matter from the nation-wide service in pathology which, in theory at any rate, became available to the general practitioner with the passing of the National Health Service Act. There can be no two opinions about the value of such a consultant service to those engaged in general practice, but it should be clearly understood that what one has in mind in saying this is a consultant service and not just the provision of laboratory aids for general practitioners.

Scope of the Service

One knows, of course, that general practice can be carried on without any help from the laboratory at all, and Duncan (1952), who practises in Portsmouth and who, incidentally, is an enthusiastic advocate of a general-practitioner service in pathology, reckons that about three-quarters of his patients can be satisfactorily treated without recourse to laboratory aid. There is little help, for instance, which the laboratory can give in the diagnosis of the exanthemata, with the exception of smallpox, of mumps, or of the common cold, and, as Duncan rightly says, there is no need to seek the aid of the pathologist in connexion with the diagnosis of influenza when this condition is epidemic. The sporadic case would, however, present an entirely different problem, for without the context of similar cases it might be difficult to distinguish it from pyrexias of undetermined origin, and in the investigation of such febrile states the help of the laboratory can be invaluable. And there are many other conditions in the diagnosis and the treatment of which the general practitioner will find consultation with the pathologist and the resources of the laboratory an advantage and sometimes a necessity: urinary tract infections, disturbances of renal function, renal failure, the many forms of anaemia, hepatitis, the virus pneumonias, and the control of the therapeutic use of such preparations as liver, vitamin B₁₂, thiouracil, and the antibiotics are some of these.

In addition to these investigations of a more or less routine type there are certain special ones which should be mentioned. Selective weed-killers of the dinitro-ortho-cresol (D.N.O.C.) type are much used these days for the various corn crops. They are applied to the growing crops in the late spring, and, although they are highly toxic for man, their continued use is widespread because of the greatly increased yield per acre which they make possible. The wearing of masks and protective clothing reduces the risk of poisoning to negligible proportions, but cases of poisoning have occurred and knowledge of the level of D.N.O.C. in the blood is helpful diagnostically, and also as a warning of impending intoxication. Hospital laboratories situated in strategic positions throughout the country undertake this investigation.

Another agricultural hazard comes from the use of organic phosphorus insecticides, such as diethyl-para-nitrophenyl-thiophosphate ("parathion"), by the fruit growers. Poisoning by these preparations results in destruction of cholinesterase, and the estimation of the blood level of this enzyme is useful to the doctor both in the diagnosis of parathion poisoning and in its prevention. Four laboratories undertake this particular investigation; they are

situated in Worcester, Peterborough, South-east London, and Portsmouth, near to the important fruit-growing districts where these particular insecticides are most used.

A third special investigation concerns the diagnosis of pregnancy. There are several tests available for this purpose, and of these the Hogben test, which makes use of the *Xenopus* toad, is probably the most satisfactory. Not infrequently it is necessary for medical reasons to know at the earliest possible time whether or not a woman is pregnant, and pregnancy-test centres have been established, at Watford and at Sheffield, to investigate these cases.

A Consultant Service

The description of the pathological service available to the general practitioner has been made in very general terms; specific mention of what to send, and when or how and to whom, has been avoided. This has been done deliberately. For one thing this article is to be followed by others dealing in a more detailed way with particular aspects of the general-practitioner laboratory service, and the answers to some of these questions will be found in them. But it has been done for a much more important and fundamental reason: to emphasize that this service in pathology offered by the National Health Service to the general practitioner is by the National Health Service to the general practitioner; for a consultant service and not a penny-in-the-slot business; for that would be no better than the postal services of the past. If a general practitioner wishes to make use of the service he should get in touch with the nearest pathologist and tell him what his problem is. It may be that it will suffice to send a specimen to the laboratory, or possibly it may require sending the patient, in which case an appointment can be made. If the patient cannot be moved it may necessitate a domiciliary visit, or, of course, it may be one of those cases in which the pathologist cannot be of help. The important thing is that the general practitioner should consult with the pathologist about his case, for only in that way will he get full value from this service.

There is another aspect to this. The general-practitioner service and the hospital service are both parts of the National Health Service equal in importance with the third component, the public health service, and, as Sir Allen Daley (1953) has pointed out in his Croonian Lectures, these three parts of the Service will make a more effective contribution to the health of the nation if they work together as closely as possible. There is a definite risk of the general practitioners and the hospitals drifting apart, so that any contacts between the two should be fostered. And here is a natural link, between the practitioner and the pathologist; it could only be to the mutual benefit of the two and of the Health Service that this link should be forged and strengthened.

Will the Pathologist be Overwhelmed?

It is common knowledge that the extent to which the pathology service is being used by the general practitioner varies greatly in different parts of the country. In some areas it flourishes, whereas in others it has hardly made a beginning; this has been attributed to the reluctance of the pathologist to encourage the practitioners to use his service for fear of being overwhelmed with a flood of work beyond the resources of his laboratory. Those of us who have had experience of this form of service would agree with Sir Allen Daley (1953) that these fears have usually proved unfounded. In defence of the pathologist who has been hesitant to undertake this work it should, however, be pointed out that when the Health Service was formed, since the practitioner work was probably an unknown quantity, the pathologist worked out the establishment of his laboratory on the basis of the hospital work it would have to undertake. He no doubt thought that he could proceed cautiously and increase his staff as the service developed; he was probably not allowed to do otherwise. Now for various reasons, economic as well as the difficulty of getting staff, he could not expand the work of his laboratory very much if he wished, and he is faced with trying to fit a quart

measure into a pint pot. So it makes it all the more important for the general practitioners to get in touch with the pathologists in their districts to find out how they are situated and what they can reasonably undertake. When this service is brought to maturity not only will it lighten the load on the hospitals by making it possible to treat more ill people in their homes, but it will bring an added interest to the work of the pathologist and make general practice an even more worth-while career.

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

CAPITAL PUNISHMENT FOR MURDER

THE ROYAL COMMISSION'S REPORT

"... to consider and report whether liability under the criminal law in Great Britain to suffer capital punishment for murder should be limited or modified."

Such was the Royal Warrant for the Commission which has been sitting under the chairmanship of Sir Ernest Gowers for more than four years and has now issued its report. Evidence was taken from 117 witnesses in Great Britain—and many more in other countries—from the Archbishop of Canterbury to the Chief Executioner. In its 500 pages the report discusses proposed amendments to the law, the exercise of the royal prerogative, and alternatives to capital punishment. The sections which will be of chief interest to medical readers are those concerning the M'Naghten Rules and concerning methods of execution. This latter subject was added to the terms of reference at the request of the then Prime Minister (Mr. Attlee).

Murder is, in peacetime, the only offence for which the sentence of death is imposed, and the only offence for which the court has no discretion to alter the sentence. The crime may be human and understandable or brutal and callous to an unbelievable degree; it may have been committed in a fit of passion or as the result of premeditation; motives may range from cupidity or lust to pity or despair, but there remains the one penalty.

Categories of Murder

During the last 50 years, in England and Wales, 1,210 persons have been convicted of murder and sentenced to death. Recommendations to mercy were made in 468 cases and reprieves were granted in 555. Murder in this country is slowly declining. The number of murders known to the police has almost consistently fallen since 1900. The years of highest incidence in England and Wales were 1903 (5.14 per million of population) and 1945 (5.11); the incidence was highest also in Scotland in the last year of the second world war. A rising figure since 1941 is for murders in connexion with sexual assault.

The Commission discusses certain categories of murder. It makes no recommendation with regard to infanticide. It is not considered right to provide by law that a mother who kills her child should in no circumstances be adjudged guilty

¹ Royal Commission on Capital Punishment, 1949-53. Report. Cmd. 8932. London: H.M. Stationery Office. 12s. 6d. net.

of murder. Nor does it advise that in suicide pacts the cases which merit sympathy should be taken out of the category of murder; it is a matter for the Home Secretary to consider advising the exercise of the royal prerogative. The same is true of "mercy killings." The plea that women should be exempted is not accepted; it is based on emotion rather than on logic. By a narrow majority the Commission recommends that the statutory age limit below which a person may not be sentenced to death should be raised from 18 to 21.

The M'Naghten Rules

Out of 3,130 persons committed for trial at assizes on the charge of murder during the present century, 1,275 were certified as insane before trial or insane on arraignment, or were found "guilty but insane," and 48 were certified insane on a medical inquiry held after the trial.

The test of responsibility which a jury must apply was laid down in the replies of the judges to the questions of the House of Lords in the M'Naghten case (1843). The M'Naghten Rules have been closely followed by judges where evidence of insanity was disputed, but have been more freely interpreted or even disregarded where insanity was accepted by the prison medical officer and not disputed by the prosecution. Nevertheless, rare cases arise in which the effect of applying the rules is that sentence of death has to be pronounced on a person whom it would be clearly wrong to regard as responsible.

Among the witnesses heard by the Commission the principal exponent of the inadequacy of the M'Naghten Rules was the British Medical Association,² which recommended the adoption of a formula for their enlargement, and this was supported by other witnesses, notably by Lord Justice Denning. In the Commission's view the test of criminal responsibility contained in the rules cannot be defended in the light of modern medical knowledge, and it adopts a British Medical Association formula, but expressed rather more shortly as follows:

"The jury must be satisfied that, at the time of committing the act, the accused as a result of disease of the mind (or mental deficiency) (a) did not know the nature and quality of the act or (b) did not know that it was wrong or (c) was incapable of preventing himself from committing it."

The Commission holds that it would be better to amend the rules in this way than to leave them as they are, but (with three dissentients) that it would be preferable to abrogate the rules altogether and leave the jury to determine whether at the time of the act the accused was suffering from disease of the mind or mental deficiency to such a degree that he ought not to be held responsible.

Medical Inquiries

Another recommendation is that, following more or less the Scottish practice, every person in England and Wales awaiting trial on a charge of murder should be specially examined by two doctors, of whom one at least should be a psychiatrist of standing, not a member of the prison medical service. The prosecution at present relies on the prison medical officer. The Commission does not recommend the appointment of medical witnesses by the courts instead of by the prosecution or defence; such a procedure would have many repercussions beyond murder trials.

The Commission is of opinion that there will continue to be cases where the accused is insane, though the issue was not raised at the trial either by the defence or by the judge, and therefore that the statutory machinery for medical inquiry after conviction should be retained. It is pointed out that these inquiries are not the same as trial by jury: the jury would consider the state of mind of the accused at the time of the offence, but the medical inquiry is directed primarily to his state of mind at the time of examination.

² Witnesses on behalf of the British Medical Association were Mr. Neville Faulkes, the late Dr. R. G. Gordon, Dr. T. Rowland Hill, and Dr. E. B. Strauss.

Methods of Execution

In the western world there are four main methods of execution in addition to hanging: electrocution (in 23 States of the U.S.A.); the guillotine (in France and Belgium); lethal gas (in 8 States of the U.S.A.); and shooting (in almost every country for those sentenced to death for offences against the military code). It is curious that hanging, which was originally adopted because it was so degrading, exhibiting the criminal in the most ignominious and abject of postures, and so thought to have a strong deterrent value, should now be defended on the score of being uniquely humane. Prison chaplains say that hanging is to be preferred "to, say, a shot from the hypodermic. . . . If a man is to die let him walk to his death cleanly." Mr. Pierrepont, the executioner, told the Commission that in his long experience he had known only one instance of struggle. It is easier for a man to show courage and composure in his last moments if the final act required of him is a positive one, such as walking, than if it is a passive one, like awaiting the prick of a needle.

The time elapsing between the entrance of the executioner into the condemned cell and the fall of the lever is normally between 9 and 12 seconds, provided the cell adjoins the execution chamber, as it usually does. In a series of 58 executions at Wandsworth and Pentonville the cause of death was shown to be fracture dislocation of the cervical vertebrae with laceration or crushing of the cord. Such dislocation causes immediate unconsciousness, though the heart may continue to beat for 20 minutes.

Lethal Gas-chamber and Injection Methods

Accounts are given of the procedure of electrocution and of the lethal gas-chamber. With electrocution the interval between leaving the condemned cell and death is two to four minutes. In the gas chamber the prisoner is apparently unconscious within four seconds of entry; certainly unconscious within five, and respiration and heartbeat have stopped within six. The Commission is in no doubt that in respect of the time taken over preliminaries hanging is superior to either of the other methods.

The Commission was impressed by the opinion of the British Medical Association that if an alternative to hanging had to be found (though it did not advocate any change) gassing by carbon monoxide would be best. There are certain objections to this, chiefly on the ground that the prisoner would not become unconscious for at least one minute after the first inhalation. Lethal injection from a hypodermic syringe is an alternative which suggests itself on the ground of humanity, certainty, and decency, though, apparently, it is not adopted in any country. The drug, probably a barbiturate, would be injected into a vein; in about 20 or 30 seconds it would reach the brain, and the prisoner would become unconscious and die a minute or two later. Expert witnesses, however, questioned the practicability of it. It is impossible to give intravenous injection to a person with certain physical abnormalities, and it is never easy to give it except with the co-operation of the subject. It also demands professional skill, and, says the British Medical Association, "no medical practitioner should be asked to take part in bringing about the death of a convicted murderer." The Commission says:

"We of course respect the attitude of the British Medical Association, but we think they may have magnified its probable consequences. A later medical witness thought the profession would treat the question as one of individual conscience, and not all doctors would feel debarred from giving instruction for such a purpose. Moreover, it is not only within the profession that the necessary skill is to be found."

The difficulty of getting executioners, if it were the only obstacle, would not prove insuperable. The Commission recommends that the question of lethal injection as a substitute for hanging be examined periodically, especially in the light of the progress made in the science of anaesthetics.

The report contains a vast amount of information about the law of murder in many countries, a historical survey of the M'Naghten Rules, and summaries of notable cases.

SCIENTIFIC FILM CONGRESS IN LONDON

[BY A SPECIAL CORRESPONDENT]

The cinematograph film as a source of amusement has for many years been one of the most popular forms of entertainment, but there is still some doubt as to the exact position it will ultimately take as a means of scientific education. Experiments have been made in many countries to advance technique, and the International Scientific Film Association has done excellent work in collating and co-ordinating the results from all over the world. The seventh International Congress, which was organized for the International Association by the Scientific Film Association of Great Britain, was held in London from September 18 to 27 under the presidency of Mr. John Maddison, and was attended by representatives or observers from 40 countries. At the same time the Royal Photographic Society's International Conference was being held and was attended by many of those interested in scientific films. Sir Arthur Elton, President of the British Scientific Film Association, played an important part in the organization of the Congress.

There was a daily continuous showing of scientific films in several different places, and on two evenings there was a gala performance at the National Film Theatre at which representative films from many countries were shown, and very remarkable some of them were. We recall with particular interest one which showed the life history of the locust, how plagues of locusts arise, and how they can be controlled; and another beautiful film which showed the flight of birds in migration. Official notice of the Congress was shown by a formal reception of the delegates by Lord Woolton at Lancaster House, and by short addresses given at the gala performances by Sir Walter Monckton and Sir Stephen Tallents.

Medical Section

There was a special medical section, of which the chairman was Professor H. M. Dekking (Holland) and the vice-chairman Dr. Ronald MacKeith (London). This section held several meetings to discuss technical points, to consider how the moving film might be applied to endoscopy, to examine its application to biology and the problems of forensic medicine, and to determine its value in medical diagnosis. The last-mentioned was perhaps of most use to the medical members. Dr. MacKeith opened the discussion by a general account of the uses of films in medicine, and he was followed by Professor Dekking, who emphasized the limitations of the film in diagnosis. Then came Mr. Denis Browne (London), who gave examples of the proper use of the film in surgical diagnosis but pointed out that films were only of use as a means of investigation leading up to the final mental process of diagnosis. Dr. P. N. Cardew (London) then stressed the importance of a knowledge of the technique of film-production if the best results in teaching were to be obtained, and finally Dr. P. J. Collard (London) gave evidence of the actual value of films in teaching. The general opinion emerged that films can be used with great advantage in teaching medicine and surgery, but they must be regarded only as animated illustrations and reminders; they can never be a substitute for the routine and time-honoured methods of medical education.

The first session of the World Health Organization's newly appointed committee on rheumatism was held in Geneva last month under the chairmanship of Dr. W. S. C. Copeman. The committee deprecated the indiscriminate use of the new hormone remedies and advised that they should be reserved for use by specialists attached to hospital departments and for clinics. They recommended that practitioners should be instructed in modern methods of early diagnosis and treatment of rheumatic diseases, and that in under-developed countries young doctors be encouraged to specialize in them.

Correspondence

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

Christmas Gifts Fund Appeal

SIR,—I shall be most grateful if you will spare space in your columns for me to appeal for donations to the Royal Medical Benevolent Fund to enable us to distribute Christmas gifts to beneficiaries of the fund.

I hope that all members of the profession will contribute towards this extra help at Christmas time, for it is enormously appreciated by doctors and their dependants who have fallen on hard times. The fact that they are remembered by their more fortunate colleagues gives the recipients of gifts even greater pleasure than the gifts themselves, which, however, provide extra comforts or small luxuries for which they have been longing.

I ask subscribers to the fund to spare a little more for this special purpose, and I beg others to become subscribers at the same time as they respond to my present appeal.

Donations and subscriptions should be sent to the secretary of the Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, and marked "Christmas Gifts."—I am, etc.,

WEBB-JOHNSON,
President,
Royal Medical Benevolent Fund.

Danger of Penicillin Injection

SIR,—At the suggestion of the manufacturers I am reporting a case of severe anaphylaxis to crystalline penicillin.

The day following my reading in the *Journal* about a case of fatal anaphylaxis to penicillin (September 12, p. 605), I had occasion to give 500,000 units crystalline sodium penicillin to a patient with a large boil on the nose. After about five minutes she was walking home and felt ill. The first symptom was swelling of the tongue and gums followed by intolerable itching of the skin in all areas. She managed to reach home, where she collapsed and became unconscious. I was called after about 15 minutes. She was still unconscious but scratching her skin persistently. Her face was swollen almost beyond recognition, and her skin showed a generalized "flare" response. She was cold, clammy, and almost pulseless. Her airway was not obstructed, however, and there was no cyanosis. She gradually regained consciousness after 1 ml. adrenaline hypodermically, but did not fully recover for another 24 hours.

This same lady, some months ago, had 300,000 units procaine penicillin, and afterwards complained of slight facial swelling and faintness. She said on questioning that she usually swelled unduly after cocaine at the dentist. I therefore assumed that she was sensitive to the procaine, and this was supported by the fact that she had three injections afterwards without any reaction at all. This last injection which was followed by such alarming results was the first for some months, though in the past two years she has had three courses of the drug.

I am happy to say that the bacteria responsible for the boil were equally sensitive to the penicillin, and the lesion had completely subsided by the next day.—I am, etc.,

Anglesey.

KATHLEEN MORGAN.

SIR,—I have read with interest the paper by Drs. Frank J. Pick and James F. Patterson (*Journal*, September 12, p. 605) and the letter from Dr. E. J. Masters (p. 629), both of which draw attention to the dangers of penicillin injection. I have personally observed two alarming reactions to injected penicillin in my own small practice.

The first was in a woman aged 30, to whom I had given 500,000 units of pure crystalline penicillin G by intramuscular injection. A few minutes afterwards her face became red and visibly swollen and there was severe difficulty in breathing. She was acutely agitated, but gave no indication of a sense of impending death such as occurred in the cases reported by Batchelor *et al.*¹ Fortunately, intravenous diphenhydramine hydrochloride ("benadryl") was immediately available, and 1 ml. was injected into an arm vein without difficulty. Recovery was rapid and was more or less complete in about 10 minutes.

The second case, also in a woman, occurred after intramuscular injection of 600,000 units of a suspension of procaine penicillin. Within one minute she became acutely ill and on the verge of collapse, but did not lose consciousness. She remained calm mentally, but repeated on several occasions that she was about to die, even going so far as to tell me where her next-of-kin could be reached. Neither intravenous diphenhydramine hydrochloride nor adrenaline was immediately available, and she was placed on a couch until she felt able to go home—a matter of about one hour later. In neither of the above cases could a history of previous asthma be obtained.

It would appear that an increasing percentage of the population is becoming hypersensitive to penicillin, and it may be that the number of near-disasters is greater than is commonly supposed. I would therefore suggest with all earnestness that the time is now ripe for urging the powers that be to agree to the release of aureomycin for general use by doctors.—I am, etc.,

Belfast.

H. J. CRONHELM.

REFERENCE

¹ *Lancet*, 1951, 2, 195.

SIR,—The great variation in form from case to case in the published reports of severe anaphylactic reactions to penicillin prompts me to report the following case which presented rather bizarre symptoms.

A woman, aged 34, had a course of penicillin injections for puerperal pyrexia $3\frac{1}{2}$ years ago, and a further course one year ago for a carbuncle on the face, without incident. There is no personal or family history of allergy. She was seen late on September 2, 1953, with acute otitis media, and was given an intramuscular injection of 1 mega unit crystalline penicillin with the usual precautions against injection into a vein. One minute later she suddenly collapsed. She remained unconscious for half a minute, then gradually came round, repeatedly expressing her conviction that she was dying. Her pulse, which was almost palpable during the phase of unconsciousness, became stronger, rate 100/min. with multiple dropped beats. She continued to feel very ill and weak, and after 15 minutes in this state she suddenly developed a very severe low abdominal colic, exacerbations and remissions each occupying about 10 seconds, and each spasm causing her to writhe. It was "like labour pains, not a bellyache." Pulse still 100/min. with multiple dropped beats. This colic continued for half an hour, then ceased suddenly. A few minutes later she seemed normal, with pulse 80/min. and regular. At no time was there any respiratory embarrassment or cyanosis. A syringe containing 1 in 1,000 adrenaline was held in readiness, but was not used.

Twenty-four hours later she commenced to menstruate, ten days before she was due. She has never before had any menstrual irregularity and has never had dysmenorrhoea. Fifteen days later an intracutaneous injection of 4,000 units crystalline penicillin in 0.2 ml. produced no reaction.

I have used penicillin on a considerable scale in doses of this order for five years, often in allergic individuals and several times in acute attacks of asthma precipitated by respiratory infection, without previously encountering a severe reaction.—I am, etc.,

Leeds, 7.

G. W. LEWIS.

The Diploma in Public Health

SIR,—The course for the D.P.H. is at present under examination by the Society of Medical Officers of Health. Having recently taken the course and engaged in public health work, I was struck by how little the D.P.H. training assisted me in my duties, particularly as so much weight was given to this diploma in advertisements for assistant medical officers of health. I hope that this letter will give rise to helpful, constructive discussion.

A considerable number of meetings were devoted to clinical instruction in infectious fevers. At present, senior medical officers of health are still in many cases in charge of fever hospitals, but it seems likely that as they retire these hospitals will come under the control of consultants appointed by the regional boards, although apparently the Ministry of Health is not yet committed on this subject. Clinical instruction in fevers would appear to be unnecessary if this assumption is correct, since epidemiology is otherwise dealt with.

A major criticism is that the teachers seemed to overlook that we were all graduates, and a great deal of time was spent in studying matter that had been already learned in our undergraduate days. A whole term was given over to visits with sanitary inspectors and health visitors, and to various departments of local authority work, but many of these had already been done in my youth, and a good many others, such as water-works, were not worth a visit. Six visits were made to a venereal disease clinic and only two to a child welfare clinic. One had the impression that much of the work had been inserted to fill out the course to a year, and indeed one of the lecturers was of opinion that the work could be done in one term. Parasitology was covered in four lectures. One of these described the life of the fly in detail, and was completely useless, since all that can be said about the fly in relation to public health can be said in a few words. Other lectures dealt with amoebic dysentery and tapeworms and were identical in content with undergraduate lectures and valueless. These lectures are a relic of past methods of instruction and their retention is unwarranted and probably due to inertia.

A committee has been appointed by the General Medical Council to examine the C.P.H. diploma, which is a necessary preliminary to the D.P.H. This involves the attendance of external examiners, as well as the payment of an examination fee, after only one term's work, and it appears that only in Bristol University do any candidates fail to proceed to the D.P.H.

The average assistant medical officer of health spends most of his time in antenatal, child welfare, and school health work, and if the dead wood was cut out of the present course there would be ample time to deal with these. The physiology of the normal child should be included in the curriculum, and extended clinical instruction should be held at child welfare centres and antenatal clinics. In fact, much of the material treated in the D.C.H. should be included. Medical officers must be trained in London before they are qualified to test intelligence quotients under the Act, but there seems no reason why instruction of this kind should not be carried out in any university and included in the course. It must be added that, although regulations are laid down by the General Medical Council as to subjects which should be included, there is some latitude in the subjects at different universities, and it may be that some of these suggestions are already practised elsewhere. At the university at which I studied there were courses of instruction in economics and insurance theory, and some time was devoted to the problems of rehabilitation, which are all extra subjects and could well give way to more relevant matter.—I am, etc.,

Gateshead.

MAX PARK.

Breast-feeding in Oxford

SIR,—May we comment briefly on a few of the points raised in the correspondence following our article? Professor R. S. Illingworth (*Journal*, August 22, p. 441) has suggested that the involuntary exclusion from the Oxford Child Health Survey of babies who had been seriously ill

during the first two months of life may have led to our obtaining an unduly favourable impression of the results of bottle-feeding. If there had been in Oxford a large number of babies who, as a direct consequence of early weaning, fell ill before the age of 2 months and either died or continued to have manifest signs of their illness after this age, then such a bias could have been introduced. We have, however, no reason to suppose that such a group of babies existed, nor do we agree that even in such a hypothetical case "the entire results would be invalidated."

We fully agree that breast-feeding, while it lasts, is a valuable protection against enteric, and possibly other, bacterial infections. Other things being equal, therefore, the amount of illness experienced during infancy should vary inversely with the duration of breast-feeding. But if it is argued that breast-feeding diminishes the incidence of illness in the post-weaning period, then clearly evidence must be produced which distinguishes between illnesses occurring before weaning and those occurring later. Unfortunately, the figures cited by Dr. Elenora Simpson (*Journal*, September 12, p. 628) fail to make this distinction. In the Oxford Survey it so happened that the babies who had been breast-fed for longest had above-average illness rates in the post-weaning period. We do not accept this finding at its face value, but we remain, for the present, sceptical of any allegedly superior resistance on the part of formerly breast-fed babies. On the other hand, the psychological advantages of breast-feeding mentioned by Dr. Duncan Leys (*Journal*, August 29, p. 508) fall right outside the scope of our observations and we do not presume to question their existence or importance.

We agree with Dr. F. Charlotte Naish (*Journal*, September 19, p. 674) that a morbidity index which takes into account the severity and length of illness provides a more precise measure of ill-health than one which merely counts cases. But we do not think that such an index would invariably result in greater differentiation of bottle- from breast-fed babies. Records of duration are available for about 70% of the illnesses covered by our study. These incomplete records show that, on average, a baby receiving breast milk recovered from an attack of bronchitis in about two-thirds of the time taken by a baby who was entirely bottle-fed. For gastro-enteritis, however, which occurred more than twice as frequently during bottle-feeding as during breast-feeding, the mean difference in duration only amounted to a decimal part of a day.—We are, etc.,

ALICE STEWART.

CELIA WESTROPP.

Oxford.

Inflamed Appendices in Femoral Sacs

SIR,—In view of the letter by Dr. T. E. Winckworth (*Journal*, September 5, p. 567), the following two cases of inflamed appendices in femoral sacs may be of interest.

A housewife, aged 50 years, suddenly noticed a painful lump in the right groin. It appeared to be partly reducible.



It remained tender and of the same size for a week, after which she was admitted to hospital. She was operated on by Mr. G. Myers on November 25, 1948, and a femoral hernia was found, containing a partly strangulated distal half of appendix. The appendix was returned to the abdomen, the sac excised, and the hernia repaired. Laparotomy was performed and a long appendix was removed. It measured 5 in. (13 cm.) in length (see photograph). About its middle was an impression left by the neck of the hernial sac and below this it was red, oedematous, and inflamed.

The patient made a good recovery, but 18 months later a large recurrent hernia appeared and a further repair was performed.

A housewife, aged 57 years, had an attack of abdominal pain and distension associated with a lump in the right groin two weeks before admission. During the next few days the lump became red and painful and then subsided, leaving a firm swelling 2 in. (5 cm.) in diameter and only slightly tender. At operation on November 17, 1952, a femoral hernia was found to be present. It contained pus and the distal half of an acutely inflamed and adherent appendix, the tip of which had perforated. The sac was excised, and appendicectomy performed through the inguinal incision. The hernial orifice was also repaired and the wound closed with drainage. Recovery was good.

Both these cases were seen within a space of four years. The specimens of both cases are now in the hospital museum.—We are, etc.,

T. D. S. HOLLIDAY.

J. R. A. WHITE.

Penzance.

Reciprocity of Qualifications

SIR,—In any future meeting of medical teachers there is one subject which could well be considered which does not seem to have been touched upon during the first World Conference on Medical Education. It is the lack of a uniform system to indicate that a person is fit to practise generally or specially in medicine in any particular country. Unfortunately, different standards are still required in various countries. However, the present multiplicity of recognized qualifications, registrable and otherwise, within countries is confusing and discourages any reciprocity. In the United Kingdom, especially, the innumerable abbreviations affixed to medical practitioners' names appear senseless, particularly to lay and foreign people.

National diplomas or degrees like those recently begun in agriculture and forestry may be the solution, provided county licensure is avoided—otherwise complex conditions similar to those in North America would arise.—I am, etc.,

HAROLD T. DAVENPORT.

Chester.

Cancer and the Public

SIR,—What value can cancer propaganda bring other than that fear which would drive many that have not got it to the doctor? In the recent inquiry by the British Empire Cancer Campaign as to whether doctors considered it a good thing, the majority were against it (see Lord Horder's letter, *Journal*, July 18, p. 148), and it is as well to realize that those against it were not doctors who were likely to "profit" by the opinion; they prefer to be free from the fear-directed patients. One might think from the propaganda enthusiasts that there was a cure for cancer, and that neither general practitioners nor patients had the sense to recognize cancer; that it needed a specialist to do this. Whereas the truth is that we have no cure, and the patient (including the doctor-patient) recognizes its possibility before any specialist can. Unless the patient goes to the doctor and is able to indicate either local signs or symptoms the specialist cannot find it, even in the sick patient, until the patient is nearly or completely dead. This can be illustrated by the histories of patients who when ill consulted the most renowned specialists and submitted themselves to all the latest forms of treatment. Even when the patient goes to the specialist with the earliest recognizable lesion, though localized surgery is then easier, he cannot truthfully say he can cure, as I know full well. And he ought not to add untruth to the anguish of the patient with advanced lesions by chiding the patient that had she come to him earlier he could have cured her, or by writing to the doctor and suggesting that he had neglected the patient by failing to send her before.

I have seen patients who have knowingly had cancer 7–10 years but have failed to consult the doctor because they

feared the fate of relatives and friends who had sought such aid, and, as Shakespeare recognized, "like the owner of some foul disease, to keep it from divulging, let it feed on the pith of life." Find a cure and there will be no need for propaganda. The major manifestations of syphilis have been abolished even though secrecy and not propaganda has dominated treatment. Neither general practitioners nor patients are the fools our propaganda enthusiasts appear to think them. The death rate from cancer is advancing in spite of all the propaganda and the use of every treatment regarded as efficacious. It is just as prevalent in those cities and countries who use these as in the areas which are "spared" these facilities. It seems to me that cellular pathology as applied to cancer has been responsible for much meddlesome interference and little advance in our knowledge. As long as treatment is based on localized lesions, instead of recognizing localized lesions as manifestations of general disease, we shall not advance. Syphilis was not cured by amputation of gummatous organs or limbs. As with any other antisocial affliction, localized shootings or amputations merely drive the growth underground. And what is this propaganda? Since it is implied that general practitioners do not understand it, is it some rare knowledge to be imparted by the most learned? No, the truth is that the truthful element in it is simple common sense which the ordinary school-leaver could readily grasp and the average person already knows, for the propagandists have not spared the public press for many years.

A well-known surgeon was recently quoted in the public press as saying: "I advise the man who smokes heavily, especially if he is over 40, to have a chest x-ray every six months—or preferably every three months—so that the physician can find the cancer, if one develops, while surgery can cure it." Apart from the truth that no one has a right to claim a cure, would it not be wise, if it can be proved that smoking is the certain cause, to prohibit smoking? I say this though the radiologist, the physician, and the surgeon with all their army of specialists and technicians would be deprived of work. If it is admitted that smoking can cause cancer once, surely it can cause it again in the same patient if, and it is a big if, surgery could cure the first lesion. John Hunter recognized the truth when he told us: "To amputate is to mutilate a patient you cannot cure." No advance has yet been made on this knowledge.—I am, etc.,

Birmingham.

JAMES F. BRAILSFORD.

The Tutorial System

SIR,—We have heard a good deal lately about the increasingly overcrowded medical curriculum, and of the difficulties of deciding what to include and what to omit.

After second M.B., the difficulties, I venture to suggest, do not arise so much from the growing amount of information as from the curious belief that unless much material is packed into courses of compulsory lectures it will not be learned. The maturing student, normally conscientious and ever aware of the forthcoming examinations, is thus placed in the position of an unwilling and irresponsible school-boy. Getting "signed-up" for such courses is a regular student preoccupation, for, besides being time-consuming, they rob him of chances of attending extra out-patients, visiting the wards, etc.

Rather than attempting to teach increasing amounts in the classroom, the student could be encouraged to learn for himself and, in addition, be given more time in which to do this. Courageous pruning of lecture courses might be coupled with the introduction of the tutorials urged by Sir Lionel Whitby (*Journal*, August 29, p. 451). Most students, I think, would welcome not only this opportunity for discussion but the directives given to their reading by the selection of given topics for these. Lecture courses, on the other hand, would be the more valuable if allotted a supplementary role to ward teaching and private reading, to fill in an ever-broadening and sometimes bewildering theoretical background.—I am, etc.,

Hull.

M. K. STRELLING.

Obituary

S. W. JEGER, M.P., M.R.C.S., L.R.C.P.

A Member of Parliament since 1945, Dr. S. W. Jeger died on September 24 at the age of 55.

Santo Wayburn Jeger was born in London on May 20, 1898, and was educated at University College, Cardiff, and at the London and St. Mary's hospitals, qualifying M.R.C.S., L.R.C.P. in 1923. After qualification he settled in general practice in London. Outside his professional work Jeger was keenly interested in politics, and he played an active part in local government. He was elected to the Shoreditch Borough Council in 1925, subsequently becoming chairman of the public health committee, and in 1930 he was elected mayor of the borough. From 1931 to 1946 he was a member of the London County Council and served on its hospitals and public health committees. In 1937 he paid two visits to Spain during the civil war to advise the republicans on medical aid work. During the last war he was medical officer in charge of a mobile ambulance unit and a first-aid post. He was one of the founders of the Socialist Medical Association.

Jeger was first returned to Parliament at the General Election in 1945, when he was elected Labour Member for St. Pancras South-east, a constituency he had unsuccessfully contested in 1935. At the General Elections in 1950 and 1951 he retained his seat in Parliament as the representative of Holborn and St. Pancras South.

W. LANGMUIR WATT, C.M.G., M.D.

Colonel Langmuir Watt, who was at one time surgeon to the radiotherapy department at Guy's Hospital, died at his home at Victoria, British Columbia, on August 14 at the age of 77.

Walter Langmuir Watt was born at Walkerton, Ontario, on July 12, 1876, and was educated at Manitoba University, where he was a medallist in arts and medicine. After graduating M.D., C.M. in 1898, he continued his medical studies at Dublin, where he obtained the diploma of L.M. at the Rotunda Hospital in 1901, and at Edinburgh, taking the Scottish triple qualification in 1907. For some time before the outbreak of war in 1914 he was in charge of the x-ray and electrotherapeutics department of Winnipeg General Hospital, but in August of that year he was mobilized with the Canadian Army Medical Corps, which he first entered in 1902, being commanding officer of the 16th Cavalry field ambulance for many years. Serving throughout the first world war, he attained the rank of colonel, was mentioned in dispatches, and was appointed C.M.G. in 1918.

After the war he settled in practice in London, and in 1923 was appointed assistant surgeon to the actino-



(Elliott and Fry, Ltd., London)

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therapy department at Guy's Hospital, where the high-voltage x-ray treatment unit for research work, provided at his own expense, demonstrated in a most striking manner its enormous powers for the relief and possible cure of cancer and of serious diseases of the blood. Later the unit was incorporated in the radiotherapy department, to which he became consulting surgeon. He retired from the active staff of the hospital, under the age limit, in 1937, but continued to practise in London until after the end of the second world war, when he returned to Canada. He married Miss Violet Clarke in 1916, and she survives him, together with the son and daughter of the marriage.

Professor MAXIME LAIGNEL-LAVASTINE, the distinguished French psychiatrist and medical historian, died in Paris on September 5. Born at Evreux on September 12, 1875, he received his medical education in Paris, where he qualified in 1903. At the Hôpital Laennec he was chef de clinique médicale from 1904 to 1907, and in 1919 was appointed chef de service. His early interests lay in neurology and psychiatry, and his many publications in this field include *La Méthode Concentrique dans l'Etude des Psychonévroses* (1928), which was translated into English in 1931. He later turned to the study of medical history and was appointed professor of the history of medicine at Paris in 1931. He was co-author of *Les Maladies de l'Esprit et leurs Médecins du XVII au XIX Siècle* (1930), and with Molinier he wrote a short history of French medicine, which in 1934 appeared in translation in the *Clio Medica* series. He edited the superbly produced three-volume *Histoire Générale de la Médecine* (1934-49). Laignel-Lavastine was elected a member of the Académie de Médecine in 1936, and was made an officer of the Legion of Honour in 1939. He was president of the Société Internationale d'Histoire de la Médecine and of the Ligue de Défense de l'Homme contre le Crime. He was on his way from Paris to preside over the Second International Congress of Hippocratic Medicine at Evian when he had a fatal coronary thrombosis.

Medico-Legal

ANAESTHETIST'S RESPONSIBILITY

The administration of a general dental anaesthetic is ruled to be the responsibility of the anaesthetist and not the dentist. The London Executive Council has had before it a case in which a dentist extracted the wrong tooth from a patient who was given a general anaesthetic by an anaesthetist. The dentist, while very much regretting the occurrence, said that in his opinion it was due to the unaccountable nervousness of the anaesthetist. The Dental Services Committee, after hearing the case, expressed its opinion in the following terms:

"There was an unavoidable breach of the Terms of Service in connexion with the administration of the general anaesthetic, and, although the fault lay primarily with the anaesthetist, the responsibility for the treatment of the patient nevertheless rests with the respondent [dental] practitioner."

The executive council communicated this to the Ministry of Health, and the Ministry responded with this contrary opinion:

"The Minister has noted and agrees with the recommendation of the council, except with regard to the findings that there was a breach of the Terms of Service. In this connexion . . . the Minister is advised by his lawyers that under the regulations the dentist is not responsible for the acts and omissions of the anaesthetist and that any person who suffers injury at the hands of the anaesthetist should be left to his civil rights for a remedy."

The Services

Colonel W. R. Ward, T.D., Q.H.S., late R.A.M.C., T.A., has been appointed Honorary Colonel of a T.A. unit in succession to Major-General R. E. Barnsley, C.B., M.C., late R.A.M.C., whose tenure has expired.

A Supplement to the *London Gazette* has announced the following awards:

First Clasp to the Territorial Efficiency Decoration.—Colonel W. R. Ward, T.D., late R.A.M.C., Lieutenant-Colonel (Honorary Colonel) E. J. G. Glass, T.D., Lieutenant-Colonel and Brevet Colonel O. G. Prosser, M.C., T.D., Lieutenant-Colonel A. E. K. Price, T.D., Major (Acting Lieutenant-Colonel) R. R. Davies, T.D., Majors J. O. McCarter, F. C. Mayo, T. R. W. Millar, T.D., J. H. Pattison, T.D., H. R. Shields, B. St. J. Steadman, T.D., and Captain (now Temporary Major, S.S.R.C.) D. R. Hood, R.A.M.C.

Territorial Efficiency Decoration.—Majors (Honorary Lieutenant-Colonels) D. A. Hunt and A. J. Moffett, Majors J. O. McCarter, F. C. Mayo, H. R. Shields, W. J. Street, Captains (Honorary Majors) H. L. Cohen (retired) and W. H. Stephen, Captain (now Temporary Major, S.S.R.C.) D. R. Hood, and Captains H. C. W. Baker and S. S. B. Gilder, R.A.M.C.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the College held on July 15, with Professor Walter Mercer, President, in the chair, the following were admitted Fellows of the College without examination: Professor Harold Robert Dew, F.R.C.S., F.R.A.C.S., Professor Robert Walmsley, M.D.

At the same meeting the following candidates, having passed the requisite examinations, were admitted Fellows: I. A. Agjee, A. M. Akram, M. A. Uddin, V. Benatar, A. C. Boonzaier, H. D. Bulos, Anne M. Calder, B. M. Chatterjee, S. Chinnatamby, B. H. Colman, D. J. Currie, D. S. Desai, R. B. Duthie, E. C. Eadie, Stella P. Eadie, H. H. Francis, R. Ger, V. N. Larsen, C. W. Law, K. H. Macdonald, J. M. Moore, A. Moselhi, W. J. Oram, J. R. S. Paterson, R. E. Peasegood, J. K. M. Quartey, W. L. Robinson, S. Schwartz, M. Shaffi, S. Sher, K. Y. Shrikhande, H. B. Torrance, H. T. V. Reddi, P. Vulfsons, R. le S. van der Riet.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The following candidates were duly admitted licentiates in medicine and midwifery on July 3, having passed the final examination in medicine, surgery, and midwifery of the Conjoint Board of Ireland: B. D. Amarasingham, J. J. Biezenski, P. J. Bofin, Eleanor R. Comyn, M. G. Connell, T. A. I. Cunningham, F. T. Daly, R. K. Doyle, H. W. Eldemire, I. J. Fibersima, P. W. Ford, C. W. Gale, T. U. Glasspole, A. J. Grehan, T. Kirkwood-Hackett, B. P. Harkin, P. J. G. Henry, T. E. C. Jarrett, Zofia Jedliczka, R. Kachan, H. Levison, Barbara Lipowska, D. Lynch, R. B. Macaulay, G. C. Martin, M. J. Murphy, A. Mutchnik, Joan McGill, E. H. Noble, G. A. Obiora, L. O'Brien, C. L. O'Connell, N. O'Connor, T. O'Keeffe, K. N. Oji, K. Ramouthar, D. Stachiewicz, M. O. Thomas, Madeline G. P. Thomson, O. A. Tomlinson, S. W. Wajdenfeld, F. H. Walter.

ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS

At the annual meeting of the College held at Hobart in March, with Dr. Alex Murphy, the President, in the chair, the following were elected to the Fellowship: Dr. Ruthven Blackburn, Dr. J. T. Cahill, Dr. M. V. Clarke, Dr. R. G. de Crespigny, Dr. E. B. Durie, Dr. T. H. Steel, Dr. I. M. Wartski, Dr. S. W. Williams, and Dr. F. Hales Wilson.

The following, having satisfied the Board of Censors in New Zealand, were admitted to the Membership: Dr. K. E. Eyre, Dr. L. G. Hannah, Dr. M. J. Murray, Dr. J. L. Newman, and Dr. G. H. Robertson.

At a meeting of the Council held at Melbourne on May 30, the following, having satisfied the Board of Censors in Australia, were admitted to Membership by the President: Dr. D. E. Anderson, Dr. Peter Bull, Dr. F. Harding Burns, Dr. Eugene G. Galea, Dr. Bryan Gandevia, Dr. R. A. Joske, Dr. J. B. Hickie, Dr. D. A. Hicks, Dr. W. M. Moore, Dr. J. L. Stubbe, Dr. H. P. B. Harvey, Dr. J. D. McDonald, Dr. J. A. W. Kelly, Dr. J. S. Calder, Dr. S. C. Milazzo.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending September 12 (No. 36) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire	Eire	Eng. & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria ..	19	1	5	0		23	4	8	1	1
Dysentery ..	204	24	126	1	5	132	17	120	4	4
Encephalitis, acute	4	0	0	0		5	1	0	0	1
Enteric fever:										
Typhoid ..	6	1	0	0		7	0	0	0	1
Paratyphoid ..	11	0	1(B)	0	2(B)	41	1	1(B)	1	
Food-poisoning ..	244	35		0		200	22		1	
Infective enteritis or diarrhoea under 2 years ..				17	46				20	64
Measles* ..	603	19	35	18	21	2,937	280	38	31	98
Meningococcal infection ..	25	0	18	1		28	1	16	0	
Ophthalmia neonatorum ..	41	3	4	0		55	3	15	0	
Pneumonia† ..	169	7	145	5		228	11	162	10	
Poliomyelitis, acute:										
Paralytic ..	92	4	20	7	9	115	16	22	9	1
Non-paralytic ..	81	6				73	12			
Puerperal fever§ ..	223	37	15	1		260	36	14	0	
Scarlet fever ..	505	28	132	24	33	557	44	156	11	28
Tuberculosis:										
Respiratory ..			111	28				121	19	
Non-respiratory ..			20	1				9	6	
Whooping-cough ..	3,708	280	344	31	30	1,831	132	89	54	116

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire	Eire	Eng. & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria ..	0	0		0	0	0	0		0	1
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..	0	0		0		0	0		0	
Enteric fever ..	0	0		0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	11	0	3	2	2	6	0	2	1	0
Influenza ..	1	0		0	0	4	0		0	1
Measles ..				0	0				0	0
Meningococcal infection ..		0					0			
Pneumonia ..	105	6	19	8	3	116	15		4	3
Poliomyelitis, acute	4	0		0		13	1			0
Scarlet fever ..		0		0	0		0		0	0
Tuberculosis:										
Respiratory ..	78	6	15	4	5	78	9	10	1	8
Non-respiratory ..		1	2	0	1		1	1	2	1
Whooping-cough ..	9	1		0	0	1	0		0	0
Deaths 0-1 year ..	214	23	21	14	15	171	11	20	9	14
Deaths (excluding stillbirths) ..	4,128	524	519	128	147	3,912	549	512	96	138
LIVE BIRTHS ..	7,360	1047	787	205	366	7,117	1004	811	212	457
STILLBIRTHS ..	154	20	21			179	28	20		

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

Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending September 19 (37th week of the year) were as follows: paralytic, 123 (92); non-paralytic, 104 (81); total, 227 (173). This is an increase of 54 compared with the previous week, the figures for which are in parentheses. The increase is largely accounted for by cases in Coventry C.B. and Kettering M.B., in both of which places there has been an abnormally high incidence of the disease. There is little reason to believe that the rise is more than temporary or that the seasonal recession will not be resumed shortly.

Poliomyelitis at Coventry

The incidence of poliomyelitis at Coventry is higher than previously recorded, and the form of the disease is the most severe known there. We are indebted to Dr. T. Morrison Clayton for the following information. In 1950 and 1951 the incidence was rather high in Coventry, with 82 cases in the first year and 98 in the second, of which 21 and 9 cases respectively were paralytic. In 1952 there were 21 cases, 4 of them paralytic. In the present year up to September 26 there have been 152 cases, 91 of them paralytic. There has so far been only one death. The age incidence of the cases notified from June 13 to September 26 is shown in the Table below.

Age	Paralytic	Non-paralytic	Total
0-4 ..	17	19	36
5-9 ..	22	24	46
10-14 ..	8	5	13
15-19 ..	6	3	9
20-29 ..	18	6	24
30+ ..	20	4	24
Total ..	91	61	152

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in August was 114, compared with 117 in the previous month and 81 in August, 1952. The number of cases of industrial disease reported was 23, including lead poisoning 1, anthrax 3, epitheliomatous ulceration 11, and chrome ulceration 5. There were no deaths.—*Ministry of Labour Gazette*, September, 1953.

Infectious Diseases

The largest fluctuations in the trends of infectious diseases in England and Wales during the week ending September 12 were decreases in the number of notifications of 350 for whooping-cough, from 4,058 to 3,708, and 199 for measles, from 802 to 603.

The incidence of measles after reaching the highest level ever recorded in the beginning of this year has now declined to the lowest for almost eight years. During the week reviewed the only large variation in the returns of measles was a fall of 83 in the number of notifications in Lancashire, from 187 to 104. The largest falls in the notifications of whooping-cough were 82 in Lancashire, from 337 to 255, 74 in London, from 354 to 280, and 61 in Yorkshire West Riding, from 321 to 260. The number of notifications of scarlet fever were 505, being 22 more than in the preceding week, and no changes of any size were reported in the local trends. 19 cases of diphtheria were notified, 1 fewer than in the preceding week. The chief features of the returns of diphtheria were a rise in Cheshire from 0 to 3 and a fall in Devonshire from 4 to 1.

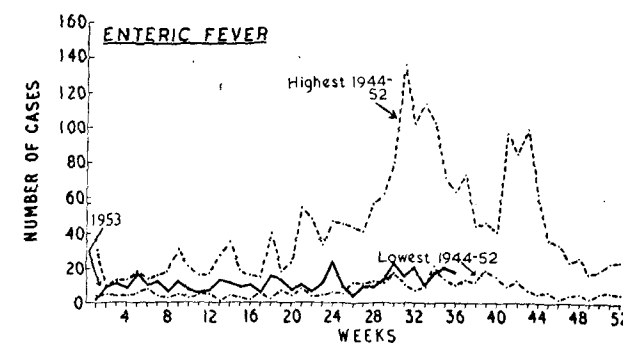
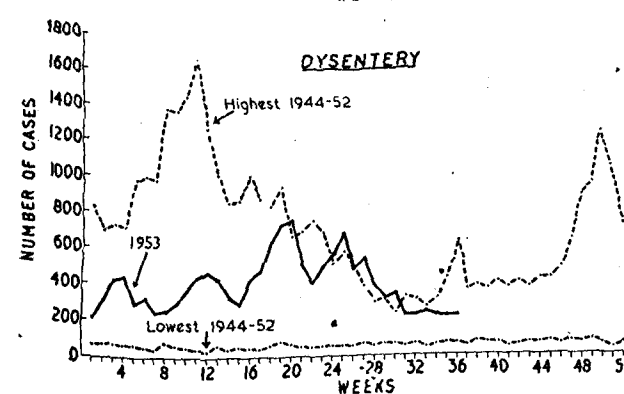
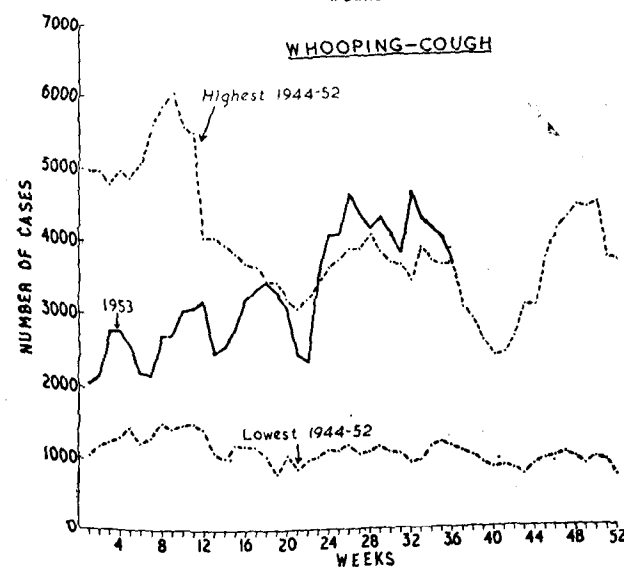
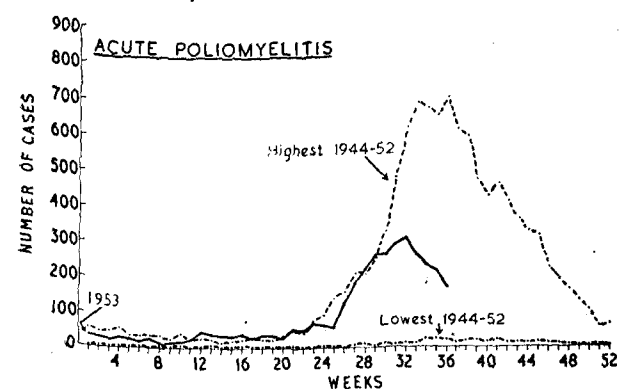
173 cases of acute poliomyelitis were notified during the week. These cases were 31 fewer for paralytic and 20 fewer for non-paralytic cases than in the preceding week. The largest centres of infection were Warwickshire 14 (Coventry

C.B. 6), Dorsetshire 13 (Poole M.B. 4), Yorkshire East Riding 11 (Kingston-upon-Hull C.B. 4, Beverley M.B. 4), London 10 (St. Pancras 6), Southampton County 10 (Bournemouth C.B. 3), Yorkshire West Riding 9 (Leeds C.B. 3), Lancashire 9, and Northamptonshire 9 (Kettering M.B. 8).

204 cases of dysentery were notified during the week, 1 fewer than in the preceding week. The largest returns were Lancashire 33 (Manchester C.B. 7), Nottinghamshire 30 (Southwell R.D. 26), London 24 (Chelsea 8), Yorkshire West Riding 22 (Bradford C.B. 12), Middlesex 19 (Ealing M.B. 5), and Cheshire 17 (Birkenhead C.B. 17).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Quarterly Returns for Scotland

The birth rate during the second quarter of 1953 in Scotland was 18.6 per 1,000, and was 0.8 below the average of the five preceding June quarters. The infant mortality rate was 29 per 1,000 registered live births; this rate was 5 below that for the corresponding quarter of 1952 and 8 below the five years' average, and was the lowest rate ever recorded for any quarter in Scotland. The general death rate was 11.2 per 1,000, being the same as the rate in the preceding June quarter but 0.4 below the five years' average. 278 deaths were ascribed to respiratory and 34 to other forms of tuberculosis, giving rates of 22 and 3 per 100,000 of the population. These rates were respectively 25 and 5 below the average of the five preceding second quarters. 84 deaths were attributed to the principal infectious diseases, being 13 fewer than in the June quarter of 1952. The deaths included in this heading were 50 from influenza, 14 from measles, 13 from whooping-cough, and 7 from meningococcal infections. The death rate from malignant neoplasms was 194 per 100,000, and was 9 above the five years' average.

Week Ending September 19

The notifications of infectious diseases in England and Wales during the week included scarlet fever 633, whooping-cough 3,555, diphtheria 25, measles 608, dysentery 202, paratyphoid fever 8, typhoid fever 6, and food-poisoning 280.

Medical News

Cancer Education.—The Standing Advisory Committee on Cancer and Radiotherapy and the Central Health Services Council have advised the Minister of Health that he should encourage local authorities and voluntary bodies to carry out exploratory schemes of cancer education to enlarge the knowledge of what can be done in this field. Accordingly the Minister of Health has sent a circular (18/53) to local health authorities suggesting that they should consider initiating cancer-education schemes through the medical officer of health, and he draws attention to the model scheme prepared by the Central Council for Health Education. Any authority considering such a scheme must first secure the co-operation of the general-practitioner and hospital services of the area, and the circular states: "Early contact with general practitioners is of particular importance and an invitation should be given to general practitioners to be represented on any committee formed in carrying out work on cancer education." The Minister considers it important that the results of exploratory schemes of cancer education should be carefully and accurately assessed, and the circular enumerates some points on which information would be especially valuable. Regional hospital boards have been asked to assist local authorities with their schemes and to do what they can to achieve the proper registration and follow-up of all cases.

No Change of Name.—At an extraordinary general meeting on September 17 the Society of Medical Officers of Health debated a special resolution to change the name of the society to "The Society of Preventive Medicine."

Dr. Andrew Topping, the retiring president, who was in the chair, said that this question had been before the society for many years, but no satisfactory alternative name had suggested itself until last year, when a joint meeting of the county and county borough groups had declared itself in favour of bringing the phrase "preventive medicine" into the title. To make this change would require a two-thirds majority at an extraordinary general meeting. A postal vote had already been taken, with 937 votes in favour of the change and 160 against it. One reason for the change was the alteration in the composition of the society during the last twenty years. There was not now a preponderance of statutory medical officers of health. After a short discussion, in which Dr. G. W. Fleming (Gosport) urged a combined name, Dr. T. Ruddock-West (Norwich), Dr. Tudor Lewis (Wandsworth), and Professor Leslie Banks (Cambridge) spoke against the change, and Dr. John Yule (Stockport) and Dr. K. Cowan (Chelmsford) supported the change of name, the proposal was defeated by 78 votes to 31. Following the extraordinary general meeting, Dr. C. Metcalfe Brown, medical officer of health for Manchester, was installed as president of the society. He delivered his presidential address on "The National Public Health Service."

W.H.O. European Regional Office.—The Regional Committee for Europe has recommended that the European Regional Office should move to premises in Geneva outside the Palais des Nations, where it has been temporarily housed for the last two years. The World Headquarters of W.H.O. are in the Palais des Nations.

Inquiry into Health Visiting.—The Ministers of Health and Education and the Secretary of State for Scotland have appointed a working party to advise on the proper field of work and the recruitment and training of health visitors in the National Health Service and school health service. The chairman of the working party is Sir Wilson Jameson. The members are Dr. A. Beauchamp, Alderman Mrs. K. Chambers, Miss E. G. Himsworth (nursing supervisor for Midlothian and Peebles), Miss E. Stephenson (chief nursing officer, Newcastle-upon-Tyne), and Dr. J. F. Warin. The inquiry will start this month.

Sir Andrew Davidson, Chief Medical Officer, Department of Health for Scotland, will visit the United States and Canada during November and December. He will be attending various public health conferences, and has accepted invitations to lecture at several American Universities.

COMING EVENTS

College of General Practitioners.—Foundation Membership of the College will close at the first annual general meeting to be held on November 14. Details of this meeting and the annual report will be sent to all members three weeks before the meeting. The following lectures on general practice have been arranged by the College. They will take place at 5.45 p.m. at the Society of Apothecaries, 14, Black Friars Lane, London, E.C.4:

- October 8—"Entry into and Setting up in General Practice," by Dr. Geoffrey Barber.
- October 13—"The Family Doctor-Patient Relationship," by Dr. George F. Abercrombie.
- October 22—"The Present Position and Future of General Practice," by Dr. John H. Hunt.
- November 5—"Common Ailments met in General Practice and Seldom Seen in Hospitals," by Dr. Geoffrey Barber.
- November 19—"Medical Ethics and the Pitfalls of General Practice," by Dr. Stephen Hadfield.
- November 23—"The Running of a Surgery and the Doctor's Room," by Dr. Ian Watson.

Charing Cross Hospital Medical School.—The inaugural address will be delivered by Admiral of the Fleet Sir Philip Vian, G.C.B., K.B.E., D.S.O., at the Royal College of Physicians, Pall Mall East, London, S.W.1, on Friday, October 9, 1953, at 3 p.m. The prizes will be presented by Lady Vian, and Lord Inman will be in the chair.

St. Andrews Medical School, Dundee.—The inaugural postgraduate lecture of the new session will be delivered on October 8 by Sir Russell Brain, P.R.C.P. The title is "Consciousness and Unconsciousness."

The Westminster Medical School.—The inaugural address will be delivered by Lord Radcliffe at Church House, Great Smith Street, London, S.W.1, on October 12 at 3 p.m. Mr. H. M. Clowes will be in the chair.

Princess Tsahai Memorial Hospital Fund.—Mr. Richard St. Barbe Baker will deliver a lecture on behalf of the Fund at the Old Library, B.M.A. House, on October 13 at 3 p.m. Mr. St. Barbe Baker will speak about a recent expedition to the Sahara Desert, and Miss Sylvia Pankhurst will report on the progress of the Princess Tsahai Memorial Hospital. Admission to the lecture will be free, but reserved seats (5s.) may be obtained from the hon. secretary, 3, Charteris Road, Woodford Green, Essex.

1953 Bengué Memorial Award Lecturer.—The Royal Institute of Public Health and Hygiene has appointed General A. M. E. Sicé, M.D., the Bengué Memorial Award Lecturer for 1953. The lecture, entitled "The Evolution of Therapeutics in the Course of the Last Few Years," will be delivered in the Lecture Hall of the Institute, 28, Portland Place, London, W.1, on October 14 at 4 p.m. Admission is free, without ticket.

Course on Allergy.—A course on allergy, comprising theoretical lectures and practical demonstrations, will be held at the Clinique Médicale, Hôpital Broussais, 96, rue Didot, Paris, 14, from October 19 to 29. Applications to attend the course should be sent to the above address; the fee is 5,000 francs for the lectures only, 8,000 francs for the entire course.

Professional Nurses and Midwives Conference.—The 38th annual conference will be held at Seymour Hall, London, W.1, from October 12 to 16, under the presidency of Sir William Gilliat. Mrs. Iain Macleod will open the conference on the morning of October 12, and the third Blackham Memorial Lecture will be given that day by the Chairman of the Central Midwives Board, Mr. Arnold Walker.

Royal Air Force.—The 23rd annual dinner of the Royal Air Force Medical and Dental Branches will be held at the Hyde Park Hotel, Knightsbridge, London, S.W.1, on Friday, October 23, 1953. All past and present officers who have served in those Branches are eligible to attend. Tickets (27s. 6d. each) may be obtained from Air Ministry (MA3), Aldry House, Kingsway, London, W.C.2.

Manchester Medical Students' Ball.—The Manchester University Medical Students' Representative Council is holding its annual Medical Ball on October 23 in the Whitworth Hall, Manchester University. Application for tickets (price one guinea for a double ticket) should be made to Mr. M. R. Thompson, social secretary of the council, Medical School, The University, Manchester, 13.

The Yorkshire Association of Graduates of Glasgow University will hold its annual dinner on October 23. The guest of honour will be Mr. W. W. Galbraith, P.R.F.P.S. Potential members of the association are asked to communicate with the secretary, Mr. James Wishart, 33, Manor Row, Bradford, 1.

NEW ISSUES

British Journal of Venereal Diseases.—The next issue (Vol. 29, No. 3) will be available in a week's time.

Thorax.—The next issue (Vol. 8, No. 3) will be available in a week's time.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d.

British Journal of Ophthalmology.—The next issue (Vol. 37, No. 10) will be available in a week's time. Issued monthly; annual subscription £4 4s., single copy 8s. 6d.

These journals are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Friday, October 2

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Dr. E. Hinden: Tuberculosis in Childhood.

Monday, October 5

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: Lecture demonstration.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—5.15 p.m., Manson Lecture by Sir Rickard Christophers: Malaria in the Field.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. Rainsford Mowlem: Role of Surgical Repair in Burns; 6.30 p.m., Mr. Denis Browne: Hirschsprung's Disease.

Tuesday, October 6

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. C. O. Carter: Principles of Genetics.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. A. Lawrence Abel: Carcinoma of the Rectum; 6.30 p.m., Major C. K. Anderson: Blood Substitutes.

Wednesday, October 7

EUGENICS SOCIETY.—At Royal Society, Burlington House, Piccadilly, W., 5.30 p.m., Mr. James Shields: Personality Differences and Neurotic Traits in Normal Twin Schoolchildren.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Normal Histology of the Skin.

INSTITUTE OF NEUROLOGY.—5 p.m., Sir Francis Walshe, F.R.S.: Principles of Clinical Neurology.

INSTITUTE OF ORTHOPAEDICS.—8 p.m., clinical-pathological conference.

MANCHESTER MEDICAL SOCIETY.—At Medical School, Manchester University, 4.30 p.m. Presidential address by Professor John Morley: A Surgical Retrospect; 8.30 p.m., Reception at Whitworth Art Gallery.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. G. H. Algire: Observations on Tissue and Tumour Growth *in vivo*.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. V. H. Ellis: Internal Derangement of Joints; 6.30 p.m., Mr. J. M. P. Clark: Some Aspects of Poliomyelitis.

SOCIETY OF PUBLIC ANALYSTS.—At Burlington House, Piccadilly, W., 7 p.m., discussion to be introduced by Dr. G. Roche Lynch: Destruction of Organic Matter.

YORKSHIRE SOCIETY OF ANAESTHETISTS.—At Leeds General Infirmary, 8 p.m., Dr. W. D. Wylie: Obstetrical Anaesthesia, with Particular Reference to Cases with Cardiac Disease.

Thursday, October 8

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., discussion between psychiatrists and physicians: Psychological Reactions to Physical Disease.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At Beveridge Hall, Senate House, 5.30 p.m., Sir Henry Dale, O.M., F.R.S.: Scientific Method in Medical Research.

● INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY.—At National Hospital, Queen Square, W.C., 5.30 p.m., Dr. J. Purdon Martin: Terminology, Diagnosis, Classification, and Physiological Considerations.

LONDON HOSPITAL MEDICAL COLLEGE.—At Bearsted Theatre, 5 p.m., Schorstein Memorial Lecture by Sir James C. Spence: Varieties of Clinical Experience.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. D. J. Robertson: Arterio-venous Fistulae of the Extremities; 6.30 p.m., Mr. Norman C. Tanner: Carcinoma of the Stomach.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Sir W. Russell Brain, P.R.C.P.: Consciousness and Unconsciousness.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Denis Williams: Neurology demonstration.

Friday, October 9

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. O. L. S. Scott: Developmental Abnormalities.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Sir Neil Hamilton Fairley, F.R.S.: Malaria and its Modern Treatment.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Professor Bryan L. McFarland: Reconstructive Surgery of the Hip.

Saturday, October 10

SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Grove Park Hospital, Marvels Lane, Lee, S.E., 10.30 for 11 a.m., general meeting. "Brain Trust." Speakers, Sir Geoffrey Todd, Dr. James Maxwell, Dr. Thomas C. Wright, and Mr. F. Ronald Edwards.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Collinson.—On September 6, 1953, at Rotherham nursing-home, to Elaine (formerly Micklethwait), wife of John Pexton Collinson, T.D., M.R.C.S., of Burgh-le-Marsh, Lincs., a son—Edward Peter.

Gibson.—On September 7, 1953, to Agnes Macfarlane Stark, M.B., Ch.B., M.R.C.O.G., wife of John Baird Gibson, M.B., Ch.B., D.A., 3, Ewbank Avenue, Newcastle-upon-Tyne—a son.

Rowe.—On August 8, 1953, at Ashleigh Private Hospital, Gosforth, to Sheila (formerly Cowling), wife of Dr. Alan I. Rowe, a son—Simon Innes.

Sloan.—On September 14, 1953, to Mairi, wife of Dr. J. Burnley Sloan, Kelvin Glen, Abbots Way, Highfield, Southampton, a son—Iain Douglas.

Tighe.—On September 11, 1953, at Birmingham, to Nora (formerly Cregan), wife of John Robert Tighe, M.R.C.S., L.R.C.P., a second daughter—Geraldine Mary.

Vella.—On September 20, 1953, at Cannock, Staffs., to Corinna, wife of Dr. J. M. Vella, a daughter.

DEATHS

Andrews.—On August 22, 1953, at his home, Beechmount, Pittville Circus Road, Cheltenham, Glos., Robin Andrews, M.R.C.S., L.R.C.P., aged 53.

Daman.—On September 3, 1953, in a nursing-home, Lincoln, Thomas Walter Alfred Daman, M.B., Ch.B., C.M.

Hardman.—On September 8, 1953, at Ryde, Isle of Wight, John Leicester Hardman, M.R.C.S., L.R.C.P., late of Nyasaland, aged 31.

Any Questions?

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

Gamma Globulin and Poliomyelitis

Q.—How does gamma globulin prevent poliomyelitis? Is it a specific effect depending on the donor having developed antibodies to the particular strain of poliomyelitis virus concerned?

A.—The success of gamma globulin in the prophylaxis or modification of measles is based on the sound assumption that most people have had an attack of measles in childhood, and that the antibodies persist into adult life and are concentrated in the gamma globulin fraction of the plasma proteins. The same assumption has been made in regard to poliomyelitis in the U.S.A., where this infection has been prevalent for the past fifty years, and in fact tests of the gamma globulin prepared from adult donors showed that antibodies to the three main types of poliomyelitis virus were present. It has also been shown that viraemia is a common occurrence in the early stages of poliomyelitis, so that an injection of gamma globulin, containing antibody to the polio virus, at a stage before the virus has become fixed in the nerve cells may be expected—and has proved—to give at least some temporary protection against the infection. In Britain poliomyelitis has occurred in widespread epidemics only since 1947, and it is not yet certain which type or types of the virus are responsible for these recent outbreaks. It would therefore be unwise, and would indeed be impracticable, to use gamma globulin from British donors for the prevention of poliomyelitis in those likely to be exposed to the risk of infection. This matter has been fully discussed in a recent leading article (*Journal*, April 18, p. 874).

Hormones in Cosmetics

Q.—Various cosmetic preparations, such as "skin foods" and certain hair preparations, are said to contain hormones. Have they any useful therapeutic action, or is their use dangerous?

A.—Most frequently these cosmetics contain oestrogens in an ointment basis. The injection of steroid hormones is a recognized therapeutic method of administration, and there is no doubt that the hormone is absorbed into the general circulation. It is possible that the local effect is more concentrated than if given orally or by injection. The effects claimed by the cosmetic sellers, such as "rejuvenation" of skin and abolition of wrinkles, have not been substantiated by any scientific findings. The same is probably true of the scalp hair. This does not mean that oestrogens are not useful under certain recognized conditions—for example, in Simmonds's disease oestrogens are beneficial to scalp hair, restoring its lustre and pigment. In some phases of the climacteric, oestrogens may be indicated.

As to harmful effects, in so far as an oestrogen is a very potent substance even in small doses, and capable of disturbing the rhythm of the menstrual cycle, it is obvious that the use of such preparations may prove harmful quite apart from the controversial question of their potential carcinogenic qualities when administered over long periods. I think it also obvious, from what I have written above, that such preparations should not be used except under the guidance of the patient's physician, who has knowledge of her underlying conditions and of the exact quantities of oestrogen he is prescribing.

There is little doubt that the sale of hormones in shops dealing with cosmetics, and their increasingly widespread

use, is giving rise to considerable anxiety, and that the problem will probably come up for evaluation and guidance under proper auspices. The writer has evidence that disturbing effects are met with, but are usually not reported. He also happened to be a member of a research committee during the war when the question of increasing the milk supply by the administration of oestrogens to cattle was being considered, and the question of the minute amount excreted in the milk was investigated. Contrary to the impression of some clinicians, the very minute amount present in a pint (570 ml.) of milk from an oestrogen-treated cow was sufficient to cause menstrual disturbances in a proportion of a group of female medical students who volunteered to undergo trials for this purpose. The oestrogen for these trials was not administered in milk, but an equivalent amount was given as a tablet.

Repetition of Gold for Rheumatoid Arthritis

Q.—How often can courses of gold for rheumatoid arthritis be repeated? A patient has had gold (1 g. on each occasion) in 1940, 1949, and 1950 with some benefit. Is a further course indicated?

A.—Gold is a cumulative drug, but, provided adequate time is allowed for elimination between courses, there is no reason, in the absence of toxic reactions, why courses should not be repeated indefinitely. In the present instance it would seem to be the correct procedure. It is true that in many cases the benefit produced by the initial courses does not seem to be so well reproduced on subsequent occasions. This has led certain workers to advocate the principle of a maintenance dose every few weeks, more or less indefinitely, instead of courses separated by prolonged intervals. One patient who has been satisfactorily maintained in this way for over fifteen years is known to the writer.

Psychological Factors and Myopia

Q.—Two children, now aged 10 and 11, a brother and sister, have during the last three years suffered from rapid deterioration of their myopia. From the psychological aspect the home environment is highly unsatisfactory. Could this play any part in the deterioration of the children's sight?

A.—Increase in the amount of myopia during the years of active growth is usual, and there is no known method of preventing such increase. The rate of increase varies among different patients, but tends to be greater in those who display myopia during early childhood. Psychological instability would not be likely to aggravate myopia. Children with more than a dioptré of myopia should wear glasses habitually. Otherwise they miss many beautiful and interesting images during their most impressionable years. Parents should never make depressing remarks about the disadvantage of glasses in the presence of their short-sighted children. Such disadvantages are far outweighed by the handicap of blurred vision, because blurred vision tends to produce clumsiness and lack of confidence.

Pock Marks

Q.—What can be done to improve the appearance of a patient whose face has been badly disfigured by smallpox?

A.—The problem of improving the appearance of a face badly disfigured by smallpox or even by acne, which is often just as bad, is a very serious one. The essential difficulty is the pitted surface, and what can be done depends upon the depth and number of the pits. If the pits are single or grouped in such a way that they can be successfully excised, this would be the preferred method; but where they are evenly spread over the face, particularly on the nose, excision is impossible. In such cases, if the scars are not too deep and they do not involve the whole

thickness of the skin, considerable improvement can be effected by sandpapering the entire area. This would be equivalent to removing the surface layers of the skin as though a skin graft had been taken from it. For this operation a general anaesthetic is required. When the skin has healed after this somewhat drastic treatment it presents a smoother and more attractive surface. Much the same effect can be produced by performing a face-lifting operation in which the skin is undermined and stretched. These surgical treatments can be applied only occasionally, and it must be regretfully stated that the vast majority of cases of smallpox are not amenable to any form of treatment whatsoever. Cosmetics and various forms of make-up seem to make the condition more apparent.

NOTES AND COMMENTS

Cyclical Buccal Ulceration.—Dr. KATHARINA DALTON (London, N.22) writes: I note in "Any Questions?" (September 12, p. 634) the history given of cyclical buccal ulceration is typical of the premenstrual syndrome as described by Dr. Raymond Greene and myself in your issue of May 9 (p. 1007). The universally successful treatment of this condition is 50–150 mg. ethisterone daily, or failing this 25 mg. progesterone injections thrice weekly, in the last fortnight of the menstrual cycle. I believe it is the placental production of progesterone during pregnancy that accounts for the almost universal disappearance of this condition during pregnancy.

OUR EXPERT writes: One of the many views about cyclical buccal ulceration is to regard it as a manifestation of the premenstrual or menstrual tension state. It does not, however, respond to treatment as well as do other symptoms of this state, and for this and other reasons the view is not yet widely accepted. On the basis suggested by your correspondent, progesterone, as well as other pregnancy hormones, has been used in treatment for many years, and was advised in the original reply to the question. Ethisterone may be given as a substitute. Dr. Dalton has been fortunate in finding this treatment universally successful, for in the experience of the writer and most other observers it is helpful only in certain cases. Gonadotrophin appears more useful in some cases and oestrogens in others, while many show no beneficial response to any form of sex hormone therapy.

Anaesthesia for E.C.T.—Dr. H. PULLAR-STRECKER (Isleworth) writes: I do not agree with your expert's opinion ("Any Questions?" August 29, p. 520). It is the preparations that frighten the patient. Having a tooth out with no anaesthetic is all right for other people, but not so good for oneself or one's friends. The same applies for E.C.T.

Correction.—In the article entitled "Blood Transfusion Accidents" (August 15, p. 390) it was stated that the British Red Cross Society has donors on its panels available for giving fresh blood of all groups, at all hours, for planned or emergency work. We have been informed by the British Red Cross Society that these emergency facilities are available only from the Greater London Blood Transfusion Service of the British Red Cross Society.

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

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Attitology, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the British Medical Journal alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: Britmedads, Westcent, London. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: Medisecra, Westcent, London. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 10 1953

CARCINOMA OF THE FEMALE BREAST: CONSERVATIVE AND RADICAL SURGERY

BY

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"I have drawn the impression that in dealing with mammary cancer surgery meets with more peculiar difficulties and uncertainties than with almost any other form of the disease. The anatomical types are so numerous, the variations in clinical course so wide, the paths of dissemination so free and diverse, the difficulties of determining the actual conditions so complex, and the sacrifice of tissue so great, as to render impossible in a majority of cases a reasonably accurate adjustment of means to an end" (James Ewing, 1928).

In 1867 Charles Moore, of the Middlesex Hospital, introduced an extensive operation for the removal of a cancer of the breast. Since that time, through the labour of many surgeons, the operation of radical mastectomy has developed, until to-day Haagensen, after careful selection of cases, requires some five hours to ensure a complete dissection. The argument for radical surgery is simple: the only safety for the patient lies in the removal of every cancer cell from her body. By mechanical means the surgeon aims to remove what he cannot control, and there is no doubt that, with selection and extensive operation, survival rate has improved and local recurrence decreased. The advent of radiotherapy had a double effect on the management of the "operable" cancer of the breast: first, it delayed the full study of Beatson's (1896) observations on breast cancer; secondly, its use as a supplement to radical surgery, by improving the survival rate when the disease has extended beyond the breast into the regional glands, has tempted surgeons to operate when the disease is perhaps too far advanced.

It was in 1922, at St. Bartholomew's Hospital, that Mr. Geoffrey Keynes, at the suggestion of Professor George Gask, began an investigation into the treatment of recurrent cancer of the breast with radium. Impressed by the results obtained, he extended the method to include advanced primary cancer, and, later still, operable cancer, for he was gravely dissatisfied with the results of the radical operation. In a series of papers Keynes (1927, 1937a, 1937b) recorded his experience with

conservative surgery and radium therapy. Primarily he hoped to mitigate or abolish the necessity for so drastic a form of treatment as the radical operation, which has a comparatively low absolute cure rate, and a definite morbidity in the form of oedema of the arm and limitation of movement at the shoulder-joint. As he gained experience Keynes maintained that, if the axillary lymph nodes are involved by growth, dissection of the axilla may be harmful, whilst if they do not appear to be invaded their dissection is unnecessary, provided radical irradiation is carried out in every case.

Anatomical investigation has shown no evidence for the centrifugal permeation of lymphatics by cancer cells. Keynes (1952) points out that Handley's work was done on pathological material taken from patients who had died of the disease, and that an abnormal state of affairs was taken as the basis for a system of treatment which was to be applied to all stages of the disease. It is only when the normal lymph channels are blocked that the cancer cell will seek out abnormal channels, such as those described by Handley. Some surgeons have been concerned lest, by dissecting the axilla, they open up pathways for the dissemination of the disease. It may, however, not be a question of opening up new pathways as much as the removal of normal pathways, leaving only abnormal ones for dissemination.

Death from cancer of the breast is almost always due to metastases transported by lymphatic or venous embolism. The recent work of Richard Handley (Handley and Thackray, 1947; Handley, 1952) has shown that, as well as the axillary glands, those along the internal mammary vessels are frequently invaded and can be regarded as immediate regional lymph nodes draining the breast. The internal mammary glands form one of the routes for intrathoracic and more distant spread, and lie outside the scope of the classical radical operation. In order to be successful, treatment must be carried out before the onset of distant metastases. Even in clinical stage I distant spread has already taken place in about 20% to 30% of patients, but once the axilla is invaded the incidence is much higher. In either stage,

if the addition of radiotherapy to radical surgery improves the results, it must be because irradiation has destroyed (or confined) cancer cells still remaining within the treated tissue. It can be argued that, in clinical stage I, radical surgery is too radical and that the chance of peripheral but still regional lymphatic spread can be met by full post-operative irradiation.

In stage II radical surgery can deal only with about one-third of cases successfully, and in the remainder the disease is already beyond the reach of the surgeon's knife. Keynes maintained that in these cases simple removal of the tumour, which may mean simple mastectomy, with simple excision of accessible lymph nodes and no disturbance of the axilla by dissection, together with full post-operative irradiation, would achieve the same result as radical mastectomy and irradiation without the morbidity of the larger operation. Indeed, if radical mastectomy exposes the patient to the risk of spread by abnormal channels the results of conservative surgery and irradiation may be better than those of more radical surgery. Surgery and radiotherapy balance each other in the eradication of cancer cells within a similar volume of tissue, and the scope of surgery can be decreased provided the radiotherapy is thorough. Actually the scope of radiotherapy is greater, for it can include the whole skin area from clavicle to costal margin and sternum to back. It can embrace the lymph nodes in the internal mammary region, the neck, the axilla, and the pathways and tissue planes in between. It can exert its full action only if anatomy and physiology have not been too seriously interfered with, and in skilled hands it can do this without risk of immediate morbidity.

Ewing pointed out many years ago that the radical operation was, on the one hand, performed too often on comparatively innocent growths, such as encapsulated adenocarcinoma, and localized duct cancers which may be ablated by simple mastectomy; and, on the other hand, on highly malignant forms of the disease which are invariably fatal. The good result in the first type of case is ascribed falsely to sacrifice of tissue, whilst in the other type of case the extreme limits of tissue removal will not save the patient.

The Present Investigation

The unique nature of the material available in the records of St. Bartholomew's Hospital for 1930 to 1939 inclusive suggested that a retrospective inquiry might be of real value in answering some of the problems of mammary cancer. During this decade a large number of cases were treated, chiefly by Keynes but also by the surgical professorial unit, by a method which was at that time considered highly unorthodox. In view of the continued dispute about the merits of radical and more conservative treatment there seemed to us to be a real advantage in comparing the results of these different methods of treatment during the same period of time, when conditions were more or less uniform. It must be recognized, of course, that certain problems may be answered only by a planned research, such as one in which alternate cases are allocated to different treatment groups. Nevertheless, it would hardly be justifiable to do this unless one had substantial evidence, such as we believe is provided by the present material, that the ultimate results are much the same for different methods of treatment.

Objects and Scope of Inquiry

We set out to analyse the results of treatment of all the new cases of primary carcinoma of the female breast seen at St. Bartholomew's Hospital during the years 1930-9

inclusive, but excluding cases sent on for radiotherapy after operation elsewhere. The main objects of the analysis were: (1) To endeavour to assess the relative merits of radical surgery and conservative surgery, together with radiotherapy in the treatment of cancer of the female breast. (2) To find out what part radiotherapy plays in the treatment, its effect on local recurrence rate, and its effects on survival. (3) To determine the morbidity of treatment, with special reference to oedema of the arm and the possible influence of radiotherapy. (4) To decide whether the radical operation justifies itself in terms of survival and morbidity. (5) Finally, if different methods of treatment have their special indications, to try to find out how the doctor may decide the best method for each particular patient.

From the total number of cases registered in the follow-up department, 182 patients from previous years with recurrent tumours were excluded, as were 102 cases operated on at other hospitals. In addition there were 60 cases for which the records were incomplete, and it was impossible to determine whether or not they should have been included. In all, 1,044 cases were available for analysis.

St. Bartholomew's Hospital, in common with other London teaching hospitals, draws its patients from a wide and indeterminate area. The existence of a large radiotherapy centre has probably been the reason for the greater number of advanced cases than is seen in most series, but otherwise there is no reason to suspect any particular selection. Once referred to the hospital, all malignant cases were registered in the follow-up department.

Follow-up and Method of Inquiry

Of the 1,044 cases all but 30 (2.9%) were followed up, either by frequent examination at the out-patient department or by postal inquiry, until May, 1951, or the time of their death. This has enabled ten-year survival rates to be calculated for the whole series, and fifteen-year rates for those registered during the six years 1930-5.

Apart from registration in the follow-up department no uniform methods of recording were used, and the only material available for study has been the routine clinical notes taken by students, house-surgeons, registrars, and consultant staff. All the records were scrutinized by two of us (I. G. W. and R. S. M.) during a period of five months in 1952, the most important details being transcribed on to special forms from which Hollerith cards were punched.

Clinical Staging.—Many of the cases had been staged at the time of first diagnosis, but as uniform methods had not always been used all were staged afresh from such information on the clinical condition as was available. The method used was a modification of the so-called "Manchester" system.

Stage I.—The tumour is freely mobile on muscle or chest wall. Ulceration or involvement of the skin must be no larger than the primary tumour and directly in continuity with it.

Stage II.—There are now palpable lymph nodes, considered to be metastases, in the axilla of the same side.

Stage III.—The primary growth is larger, and is now fixed to muscle but not to chest wall. Skin involvement can be wide of the primary tumour but is still over the breast. Axillary glands, if infected, must be mobile.

Stage IV.—The growth has extended beyond the breast and immediate regional lymphatic glands. Fixation of axillary glands or fixation of the primary to the chest wall places the tumour in stage IV.

The distribution by clinical stages for the whole series is shown in Table I.

TABLE I

	Clinical Stages				Unstaged	Total
	I	II	III	IV		
No. of cases	339	302	286	106	11	1,044
%	32.5	28.9	27.4	10.2	1.1	

General Features of the Series

Age.—The age distribution of the whole series was as follows:

Years:	0-24	25-34	35-44	45-54	55-64	65-74	75+	Not Stated	Total
Number	3	37	190	317	298	159	38	2	1,044
%	0.3	3.5	18.2	30.4	28.5	15.2	3.6	0.2	

This follows the familiar pattern with nearly 60% of cases falling into the group 45-64. Over the age of 65 there were perhaps fewer cases than appear in most comparable series—for example, 18.9% compared with 29.0% given by Harnett (1948). The proportion of single women was 21%, and this agrees with other published series. There were three cases of lactation carcinoma, and in four cases

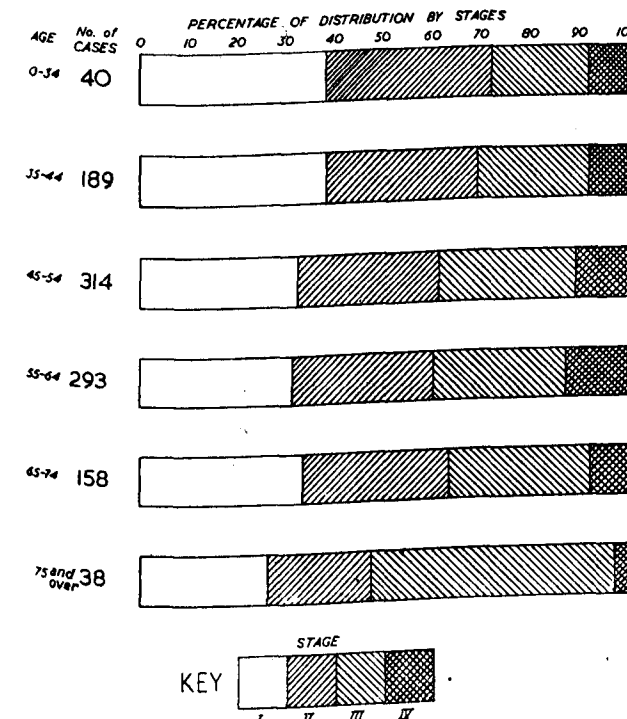


Fig. 1.—Distribution of clinical stages according to age. Eleven cases with stage unknown and one other case with age unknown are excluded.

the disease was diagnosed and treated during pregnancy. Fig. 1 shows the distribution of clinical stages for the different age groups. Of women aged less than 45 about 70% had tumours which were in clinical stages I and II, whereas at all ages from 45 to 75 the corresponding proportion was about 60%. There were only 38 women aged 75 or more, and half of these were in stages I and II.

Site of Tumour.—The site of the tumour in the breast was recorded in all but 26 cases, although the quadrant was not always specified. Fig. 2 shows the percentages occurring in the four quadrants and also of those simply recorded as "upper," "lower," "inner," or "outer." In 8% of cases the tumour was described as central, and 12% of cases the whole breast. Exact comparison with other series is made difficult by the absence of precise definitions. For the purposes of later analysis all inner and all outer tumours have been grouped together, other sites being, for this purpose, ignored. Of the 502 outer-half tumours, 37% fall into stage I and 35% into stage II. The corresponding figures for the 182 inner-half tumours are 46% and 29%. Simultaneous bilateral tumours were recorded in eight cases, giving a slightly lower proportion than has been noted by other observers. For the rest of the series the excess of left-sided

over right-sided tumours was 11%, a figure that agrees closely with those cited by Nohrman (1949). Among these were 37 (4%) in which the other breast was, either previously or subsequently, the site of a carcinoma; but there is, of course, a possibility of confusion between some of these cases and the true simultaneous tumours.

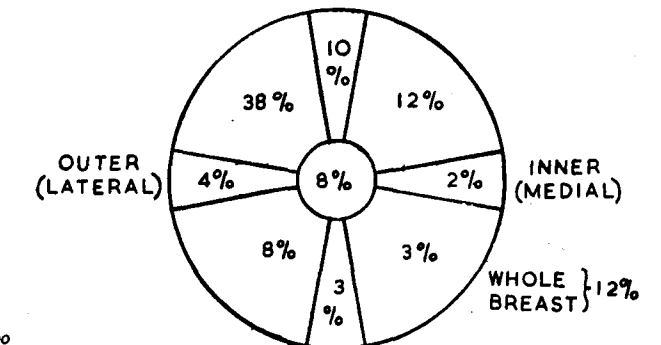


Fig. 2.—Distribution of tumours by site. The narrow sectors indicate the proportions of tumours recorded simply as "upper," "lower," etc. The percentages are calculated from the whole series less the 8 cases with bilateral tumours and the 26 for which no exact site was recorded.

Length of History.—Were it possible to obtain accurate information of the time when the lump in the breast first appeared it might be possible to calculate some sort of index of growth rate, or essential malignancy for each tumour. But, in the nature of things, such information is unobtainable, and all we can give is the length of time for which the patient can remember symptoms. This length of history is naturally correlated with the clinical staging, as is shown in Table II, but not to such an extent that all difference in

TABLE II.—Clinical Staging and Length of History

Length of History (To Nearest Month)	No. of Cases	Distribution by Stages			
		I	II	III	IV
1 month	117	40%	41%	13%	6%
2 months	122	40%	34%	18%	7%
3 months	107	37%	26%	24%	12%
4-6 months	222	39%	28%	25%	8%
7-11 months	230	23%	29%	33%	15%
1 year	118	25%	26%	40%	9%
2 years	93	31%	21%	40%	8%

This table excludes 33 cases with unknown length of history and two other unstaged cases.

staging can be explained in this way. For example, 19% of the 117 patients with only one month's history of symptoms were in stages III or IV by the time that they were seen, whilst of the 93 women who claimed more than two years' history no less than 31% were still in stage I.

Pathological Grading and Staging.—Histological reports were usually available, but it was clear that any attempt to grade the tumours from the reports alone in the manner suggested by Bloom (1950) would not be justified. It was not found practicable to study the original sections. It was, however, recorded whether or not the axillary glands had been invaded, and this will be referred to as the pathological staging. Pathological reports were available in 448 of the 505 cases in which the axilla was dissected, and Table III

TABLE III.—Clinical Staging and Gland Involvement

Stage	No. of Cases with Axillary Dissection	No. of Cases with Histological Reports	Percentage Reported as Having Glands not Involved
I	184	164	71%
II	202	180	23%
III	103	93	17%
IV	13	11	—

This table includes all cases subject to radical or modified radical surgery, other than three unstaged cases.

shows the results according to the clinical staging. It will be seen that for stage I the clinical assessment was upheld by the pathology report in 71% of cases, whilst in the remaining 29% the clinician had been unable to detect an involvement which was later proved to be present. In stage II, on the other hand, there were 23% of cases in which the clinician reported gland involvement which the pathologist was unable to confirm. It is perhaps interesting that whereas, as has been shown, there is an appreciable association between length of history and clinical staging, there is no such clear association between length of history and gland involvement. This may be seen from the following analysis. If we take the 428 cases in clinical stages I, II, and III (omitting the few for whom the length of history was not given), the following percentages are the proportions of cases in each stage with a length of history of six months or more: Stage I, 43% (161); Stage II, 54% (177); Stage III, 64% (90). If these same cases are now divided according to the histological reports we have: Glands free, 51% (170); involved, 52% (258), the figures in parentheses being the numbers of cases on which the percentages are based.

Methods of Treatment

The methods of treatment used in this series are shown in Table IV; there were three main surgical treatment groups: simple surgery, radical surgery, and modified radical surgery.

TABLE IV.—Methods of Initial Treatment for the Whole Series

	With X Rays	With Radium	Without Irradiation	Total
Simple surgery	70	101	58	229
Radical	147	7	184	338
Modified radical surgery	51	70	46	167
Without surgery	114	149	47*	310
Total	382	327†	335	1,044

* Untreated cases. † Includes two cases treated with radium and x rays.

cal surgery. Each of these three groups is further subdivided into surgery alone, surgery with x rays, and surgery with radium. A few of the cases treated initially by simple surgery had more extensive operations at a later date, but the figures in the Table refer only to the primary treatment and not to any subsequent operations or irradiation.

Simple Surgery.—This group comprises 229 cases, 58 being treated by operation alone, 70 by simple surgery and x rays, and 101 by simple surgery and radium. The operation was confined to simple excision of the tumour in 127 cases and the remaining 102 had a simple mastectomy. Two-thirds of the cases were under the care of Keynes or the surgical professorial unit. In the earlier years Keynes tended to do local excision of the tumour, but the occasional occurrence of carcinoma elsewhere in the breast led to his adoption of simple mastectomy in most cases. Ten of the 127 simple excision cases had more radical surgical treatment at a later date; these include one modified radical operation four months after local excision and x rays, and three modified radical and six radical mastectomies from one to thirteen years after simple excision and radium treatment. Even after excluding these ten secondary operations for persistent or recurrent disease it should be noted that more than half the cases in the simple surgery group were treated by the minimum of surgery.

Radical Surgery.—Radical mastectomy with or without irradiation was performed as the initial method of treatment in 338 cases—that is, in 32% of the whole series. Fig. 3 shows that the proportion remained fairly steady throughout the whole 10 years. A study of the case records of those treated by radical surgery and knowledge of the practice of individual surgeons indicate such variations in surgical technique as one would expect among different operators. (The operations were done by 12 members of the consultant staff and their chief assistants and also by the professorial staff.)

Modified Radical Surgery.—This is the descriptive title used for simple mastectomy and axillary clearance without removal of the pectoral muscles. A special group of 70 cases treated by modified radical mastectomy by the surgical professorial unit formed a research series which has been reported by Professor Sir James Paterson Ross (1938). This

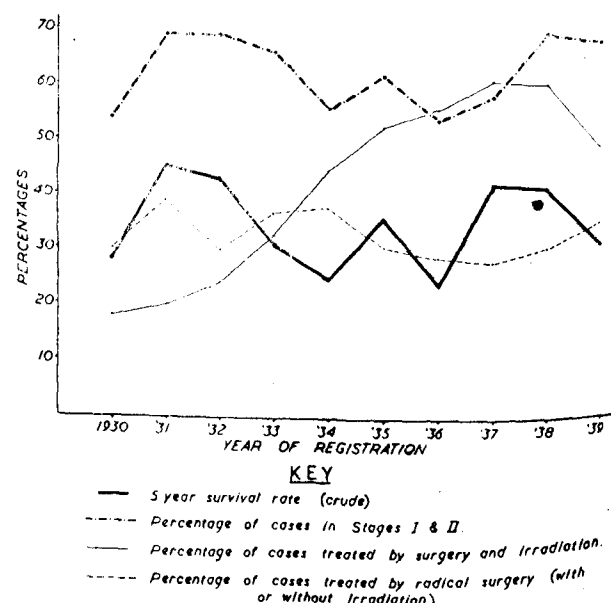


FIG. 3.—Crude five-year survival rates for cases registered each year, compared with percentage of cases in clinical stages I and II.

was an almost consecutive series of cases in which mastectomy followed radium treatment after an interval of three months in 50 cases and of six months in the remainder, and the operation was done with the object of providing material evidence of the effects of irradiation rather than as a method of treatment *per se*. This series is too small to permit any definite conclusions about the value of this form of combined treatment. The reasons for performing this operation were not often given in the records of the remaining cases, but sometimes it was done in elderly or less fit patients in whom the radical operation was considered too severe. It is an operation which provides fuller pathological data than simple mastectomy, but it is doubtful whether there is any direct therapeutic advantage.

Irradiation

Radium treatment alone was used initially in 149 cases, but subsequent simple mastectomy was done in 13; radical mastectomy in 7, and modified radical mastectomy in 5. About a quarter of those treated by radium alone were in stage I, but as the diagnosis was not always confirmed by biopsy one must be cautious in assessing the results for radium treatment alone.

Simple surgery and radium were combined in the treatment of almost half the cases dealt with by limited surgery. The technique of radium therapy was that described by Keynes (1929, 1932), and it will not be further discussed here. Radium was combined with radical surgery in seven cases, all of which were treated in the earlier part of the decade under review, when x-ray methods were still being developed.

X-ray treatment alone was reserved chiefly for advanced cases, and only 6% of this group was in stage I. Rarely was the diagnosis confirmed by biopsy. X rays and simple surgery were used less often than the combination of radium and simple surgery, although, in the light of experience, the former method gradually became more popular.

Radical surgery and x-ray therapy, generally post-operative, was used in almost half the radical mastectomy cases. Dosage was in the region of 4,000 r minimum, during a period of four weeks, directed to the chest wall, axilla, and

supraclavicular regions. In 15 cases the treatment was given pre-operatively, the usual reasons being either a large growth or advanced disease. With so many different surgeons at work and in the absence of any well-defined criteria for x-ray treatment, it is not possible to give any clear indication of how cases were selected for irradiation. Towards the end of the period under review some surgeons were tending to refer all patients for post-operative radiotherapy, but in general those irradiated included a higher proportion of less favourable cases. Fig. 3 shows how the combination of surgery and irradiation became increasingly popular, the proportion thus treated being 18% in 1930 and 60% in 1938, although it fell to 48% in 1939.

Untreated Cases.—Of the 47 untreated cases 14 were in stage III and the remainder in stage IV. Only two patients in the whole series refused all treatment.

Assessment of the Results of Treatment

Discussion has raged for many years regarding what is the most appropriate way to measure the results of treatment of cancer of the breast. A whole battery of statistical and actuarial techniques has been introduced, but in spite of this there is still no general agreement on the fundamental question of how long, if at all, life is prolonged by any form of treatment. Greenwood (a pioneer in this field) asserted (1926): "The expectation of life of a woman with untreated cancer of the breast is 3.25 years. The expectation of life of a woman operated on under 'average' conditions is 5.74 years and of a woman operated on under the best conditions is 12.93 years." His analysis may seem somewhat naive to our present way of thinking. At the other extreme we have Park and Lees (1951): "It has not been proved that the survival rate of cancer of the breast using the five-year survival rate as an index is affected by treatment at all."

This is not the place to discuss the statistical problems involved, for we are concerned in this paper only with the relative results of different forms of treatment: in choosing the statistical method most appropriate to our purpose our chief requirements are: (1) that the method chosen should be simple to use and understand; (2) that it should be reasonably sensitive; and (3) that it should allow for any gross bias introduced by selection between the groups.

The method we have adopted is to express our results in terms of five- and ten-year survival rates calculated separately for the different stages and adjusted by Berkson's (1942) method to allow for variations in the age distribution. Fifteen-year survival rates have also been calculated for the 600 cases registered from 1930 to 1935.

Recent observers are agreed that staging, whether assessed clinically or pathologically, is the most important single factor in prognosis. This is clearly demonstrated by Fig. 3, in which are plotted: (i) the crude five-year survival rates for all cases registered in each of the years 1930-9, and for all cases registered in each of the years 1930-9, and (ii) the percentages of stages I and II cases among each year's registrations. It will be seen that the two graphs have an almost identical pattern. (The other graphs plotted on this diagram have been referred to already.) The survival rates for the different stages are so different that little or no useful information can be gained from a study of figures in which no distinction is made between them. Even methods of standardization, such as that recommended by Park and Lees (1951), are open to serious disadvantages.

In using time of survival as an index of the success of treatment it is clear that no satisfactory comparison can be made without taking age into consideration. For example, in 1931 the expectation of life of a woman of 40 was about 32 years compared with only 10 years for one of 70. This difficulty is particularly important in a disease like carcinoma of the breast, where there is a relatively high survival rate even at 10 years. One solution of the problem is to confine analysis to those actually dying of cancer; if all patients lived and died under the care of the hospital where they were first treated this might be the ideal solution, but in practice it leads to difficulties. We have preferred, there-

fore, to use the method first proposed by Berkson and now adopted by W.H.O. (1950)* for the purposes of international comparisons.

For any group of people of known ages it is possible to calculate the number who may be expected to be alive after a given number of years, assuming that they are subject to the normal mortality experience of the whole country as expressed on the Registrar-General's Life Tables. We can therefore define the crude and adjusted rates as follows:

$$\text{Crude rate} = \frac{\text{No. alive and traced after } n \text{ years}}{\text{No. originally registered}} \times 100$$

$$\text{Adjusted rate} = \frac{\text{No. alive and traced after } n \text{ years}}{\text{Expected No. alive after } n \text{ years}} \times 100$$

It will be seen that no allowance is made for the possible survival of any of the untraced cases.

The chief advantage of this method is that it is entirely objective, but one disadvantage is that it is effective only for groups of such a size as to even out chance fluctuations in the number of deaths due to intercurrent disease. The effect of the adjustment is illustrated by the following figures, showing the crude and adjusted rates for two age groups:

		10-year Survival Rates	
		Crude	Adjusted
Stage I cases	Ages 0-44	45%	48%
	" 65-	22%	49%

When comparing treatment groups there was not as much difference as this between the crude and adjusted rates, for there were no very great differences in the age distributions of the groups under consideration. Nevertheless the adjustment is certainly worth making when ten- or fifteen-year rates are being used.

Another problem that has to be solved is that of defining the groups for which survival rates shall be calculated. There are so many factors, such as age, stage, and site, as well as variations in surgical and non-surgical treatment, that it would be impossible from a series of the size available to a single hospital to split up the figures in such a way as to enable the effect of all these factors to be sorted out. In order to get any results at all a fairly drastic grouping has to be accepted—the more so since, as has been said, it has been felt necessary to give all results separately for the four clinical stages. But to ensure that no important effect has been masked by such grouping, we have in most instances examined the figures in greater detail than can be shown here.

In the following analysis no mention is made of the statistical significance of the results. In a retrospective survey of this kind formal tests of significance are often most misleading. Little is known of what selective factors may have been at work, and the very methods of grouping introduce a highly subjective element into the calculations; it is often possible to change a "significant" into a "not significant" result merely by making an arbitrary change in the classification. All we shall do is to present the survival rates we have calculated and draw such tentative conclusions from them as we feel able.

* The formula given by the W.H.O. report is as follows:

$$\text{Corrected survival rate} = \frac{1}{p} \times (\text{crude survival rate})$$

where p is the probability of not dying within a comparable period from any cause other than cancer of the site in question, in a population having the same age distribution as the patients comprising the group. The report points out that for most sites p does not differ appreciably from the probability of not dying from any cause, and although the female breast might be regarded as one of the sites where the distinction should be drawn, we have not felt it necessary when using the adjustment only for internal comparisons. Our definition is equivalent to the W.H.O. formula, but defining p as the probability of not dying from any cause.

The W.H.O. report does not recommend a method of calculating p , and there is some variation of practice in the matter. To calculate the expected number of survivors we have used the values for women of ${}_0p_x$, ${}_{10}p_x$, and ${}_{15}p_x$ derived from English Life Table No. 10 (1930-2) (and kindly supplied by the General Register Office). For our purposes it has been sufficiently accurate to use ten-year age groups for the calculations.

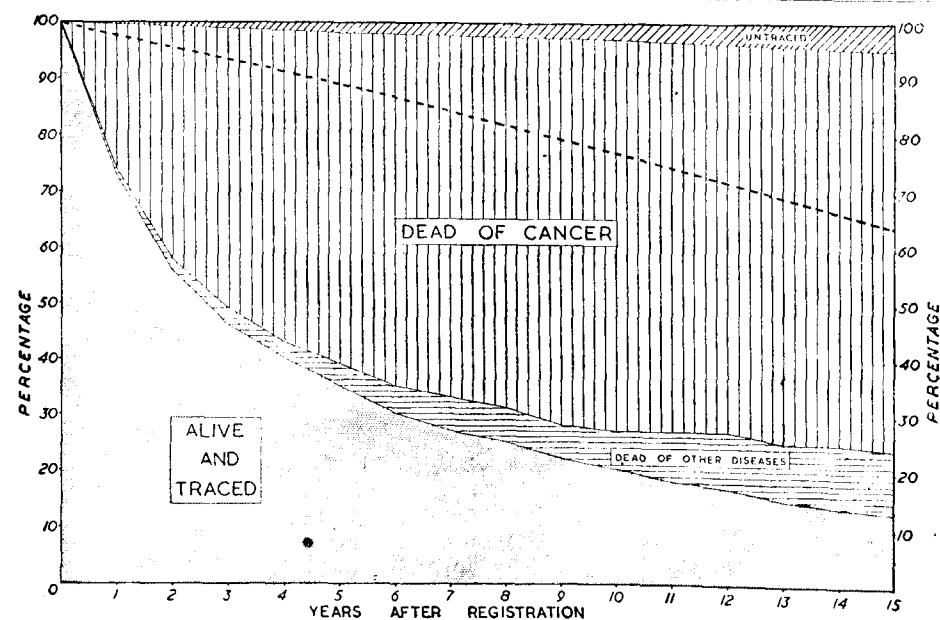


FIG. 4.—Percentages dead and alive based on whole series (1–15 years). (The dotted line indicates the expected survival of a normal group with similar age distribution based on Life Table for 1931.)

Although it is not our object to discuss the overall results of the series, it may be of interest to give them in the form of Fig. 4; this shows the crude survival rates for the whole series (including untreated cases) from one to ten years and for the 600 cases registered between 1930 and 1935 from 10 to 15 years. The numbers recorded as dying of recurrent disease and those untraced are also shown.

Results of Treatment

In presenting results we have compared the survival rates for the different types of surgical treatment—that is, simple, radical, and modified radical surgery—and also those for surgery alone and surgery with irradiation. The number of cases in each of the various subgroups shown in Table IV is generally too small for any comparison of the results obtained, with the possible exception of radical mastectomy. In Fig. 5 the results are shown for five main treatment

the survival rates are almost of surgery.

In assessing these results it should be remembered that the simple surgery group includes 127 cases treated by simple excision of the tumour. Only 10 of these subsequently had a more extensive operation, and the other 117 cases were therefore treated by an operation which most surgeons would regard as quite inadequate. The fifteen-year adjusted survival rates (calculated from the 600 cases registered between 1930 and 1935 inclusive) were 42% for simple surgery, 42% for radical surgery, and 37% for modified radical surgery, the crude survival rates being 28%, 27%, and 26%. We must conclude from these figures that the results for simple surgery are as good as those for radical surgery.

Surgery Alone and Surgery with Irradiation.—Radiotherapeutic technique was developing during the decade in question, and it may be that the selection of cases was not

groups, the various subgroups being ignored. The simple, radical, and modified radical surgery groups include all cases treated by these methods regardless of whether irradiation was also given. The last two groups—surgery alone and surgery with irradiation—include all surgical cases irrespective of the type of operation done. Full details of the various subgroups are shown in Table V to supplement the information given in Fig. 5.

Simple Surgery and Radical Surgery.—Fig. 5 shows that at the five-year follow-up the adjusted survival rates in stage I are slightly in favour of simple surgery, but that this trend is reversed at ten years. Modified radical surgery shows a lower five-year and a higher ten-year survival rate, but there are only 37 cases in this group. In stage II cases identical for the three types

such as to allow the benefits of radiotherapy to be clearly demonstrated. Fig. 5 shows that the five-year survival rates in stages I and II were practically the same for all surgery alone and all surgery with irradiation. The ten-year survival rates were, however, slightly higher for surgery with irradiation in both stages. Fuller details of the subgroups are given in Table V, where it will be seen

that radical mastectomy with irradiation gave slightly better survival rates than radical surgery alone in stage I at five- and ten-year follow-up. The results were also better at ten years in stage II. However, in both cases the numbers were small, and it is impossible to draw firm conclusions.

Value of Clinical and Pathological Staging

It is commonly assumed that pathological staging is superior to clinical staging in the assessment of prognosis, but it would be better to say that the methods are complementary. In those cases in which the axilla is not dissected the staging must necessarily be clinical, and even where the axilla is dissected the pathological examination of the axillary glands is, as Handley (1952) has shown, by no means the last word. The margin of error in clinical staging has already been referred to; but, despite this, there seems reason to believe that clinical assessment of the axilla may offer a more accurate clue to prognosis than might be expected. Table VI shows the five- and ten-year survival

TABLE VI.—Gland Involvement: Five- and Ten-year Adjusted Survival Rates for Cases in Stages I–III after Radical or Modified Radical Surgery.

	Stage I		Stage II		Stage III
	Glands Free	Glands Involved	Glands Free	Glands Involved	All Cases
No. of cases	117	47	42	138	103
5-year survival rate	78%	52%	51%	37%	14%
10-year survival rate	67%	25%	29%	22%	5%

There are not enough cases in Stage III with glands free to enable separate figures to be given (see Table III), but overall rates are included for purposes of comparison.

rates for 447 cases, treated by radical or modified radical mastectomy, in which a pathological report on the axillary glands was available. The cases in clinical stages I and II are subdivided into those with glands free and those with glands involved. The second and third columns of figures in this table represent, therefore, those cases in which the clinician was wrong in his assessment of the axilla.

The lower five-year and ten-year survival rate in stage I with glands involved as compared with stage I cases with glands free is readily understandable. It is, however, less easy to comprehend why stage II with glands free should show the same survival rate as stage I with glands involved. This might be regarded as just a strange anomaly in our figures, but a similar state of affairs is indicated in a table of Smithers (1952), on which no comment is offered in the text.

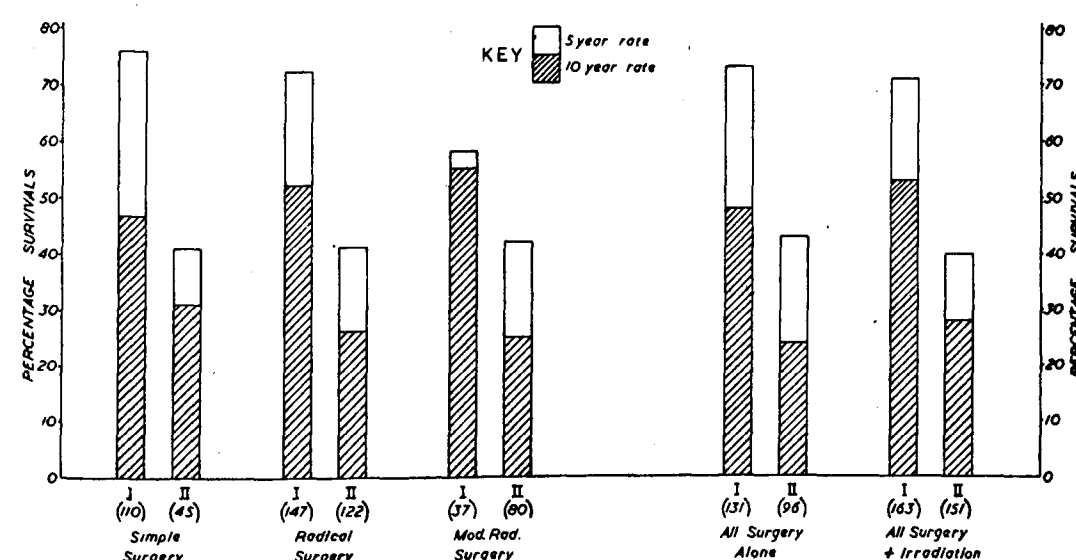


FIG. 5.—Adjusted five-year and ten-year survival rates for surgical cases (stages I and II only). The figures in parentheses are the numbers of cases from which the survival rates are calculated.

The practical importance of this finding would seem to be that, in those cases in which the clinician believes the axillary glands to be involved, the prognosis may be much the same, regardless of whether the diagnosis is confirmed pathologically. The high incidence of reactive hyperplasia in the axillary glands of breast carcinoma cases is, of course, well recognized by pathologists. The cause of the reactive hyperplasia which produces the enlarged but cancer-free glands is not known, but Professor Hadfield (1952, personal communication) believes that it may be related to the microscopic foci of necrosis throughout the tumour. Whatever the explanation of this interesting finding may be it does seem to be a matter worthy of fuller attention and investigation, for its relationship to a more serious prognosis is not explicable in terms of orthodox pathology.

Apropos of clinical staging, it is perhaps important to recognize that a clinician is more likely to detect a just palpable axillary gland and to examine the patient more carefully if the primary tumour is a large one. It is likely that this factor—that is, the size of the tumour—explains some of the difference in prognosis in these cases, but it will not adequately explain the similar prognosis for stage I cases with glands involved and stage II cases with glands free.

Site of Tumour and Prognosis

Several published reports (Perry, 1925; Truscott, 1947; Smithers, 1952) have recorded lower, but not significantly lower, five-year survival rates for growths in the medial half of the breast.

For our series, as shown in Table VII, the five-, ten-, and fifteen-year survival rates in stage I were much the same

TABLE VII.—Lateral and Medial Tumours: Five-, Ten-, and Fifteen-year Adjusted Survival Rates for Surgical Cases in Stages I and II.

	Stage I		Stage II	
	Lateral	Medial	Lateral	Medial
Whole series:				
No. of cases	159	71	136	41
5-year survival rate	73%	70%	47%	38%
10-year survival rate	52%	53%	29%	25%
1930–5 series:				
No. of cases	94	39	82	19
15-year survival rate	42%	43%	28%	(15%)

for tumours in medial and lateral halves of the breast. In stage II cases, however, the survival rate was slightly lower for tumours in the medial half of the breast; but this is only what might be expected, since a medially situated tumour with axillary glands palpable is likely to be at a

TABLE V.—Adjusted and Crude Survival Rates for Stages I–III According to Method of Treatment

	All Cases Stages I–III	Stage I				Stage II				Stage III			
		Total Cases	Survival Rates Adjusted and Crude (%)		Total Cases	Survival Rates Adjusted and Crude (%)		Total Cases	Survival Rates Adjusted and Crude (%)		Total Cases	Survival Rates Adjusted and Crude (%)	
			5-year	10-year		5-year	10-year		5-year	10-year		5-year	10-year
All treated cases	913	339	72 (65)	51 (40)	302	39 (35)	26 (20)	272	12 (11)	4 (3)			
Simple surgery:	216	110	76 (69)	47 (37)	45	41 (36)	31 (22)	61	15 (13)	6 (5)			
Without irradiation	55	30	86 (77)	43 (33)	7	—	—	18	—	—			
With x rays	63	20	—	—	9	—	—	34	10 (9)	4 (3)			
„ radium	98	60	73 (67)	49 (40)	29	39 (35)	27 (21)	9	—	—			
Radical surgery:	329	147	72 (65)	52 (41)	122	41 (38)	26 (22)	60	9 (8)	4 (3)			
Without irradiation	180	88	71 (62)	50 (38)	63	46 (43)	25 (21)	29	11 (10)	4 (3)			
With x rays or radium	149	59	73 (68)	55 (46)	59	34 (32)	28 (24)	31	7 (6)	4 (3)			
Modified radical surgery:	160	37	58 (54)	55 (46)	80	42 (38)	25 (19)	43	20 (19)	8 (7)			
Without irradiation	45	13	—	—	26	31 (27)	16 (12)	6	—	—			
With x rays	48	3	—	—	24	—	—	21	—	—			
„ radium	67	21	—	—	30	44 (40)	34 (27)	16	—	—			
All surgery without irradiation	280	131	73 (65)	48 (37)	96	43 (39)	24 (19)	53	20 (17)	8 (6)			
„ „ with „	425	163	71 (65)	53 (43)	151	40 (36)	28 (23)	111	12 (11)	5 (5)			
Irradiation alone:	208	45	75 (64)	50 (36)	55	31 (27)	22 (16)	108	9 (7)	1 (1)			
X rays	71	7	—	—	6	—	—	58	0 (0)	0 (0)			
Radium	137	38	75 (66)	56 (42)	49	30 (27)	19 (14)	50	19 (16)	3 (2)			

(a) The following cases are omitted from this table: 106 cases in Stage IV, only one of whom survived 5 years; 11 unstaged cases, whom survived 5 years; 11 unstaged cases.
(b) Survival rates for subgroups containing fewer than 25 cases are not shown.
(c) The crude survival rates are shown in parentheses.

more advanced stage of its development than a laterally situated tumour with palpable glands. Handley (1952) has shown that the internal mammary lymph nodes are invaded in 60% of cases with medial tumours, and in only 19% with lateral tumours, and on this evidence one would anticipate a worse prognosis for those patients with medially situated tumours.

Despite the greater ease with which the medial growth may reach the mediastinum our own figures would suggest that, in the absence of palpable axillary glands, prognosis is no worse for a tumour in the medial half than for one in the lateral half, and this is a point of some importance to the clinician faced with the daily problems of breast carcinoma.

Length of History and Prognosis

It may be asked whether we can demonstrate from our figures that delay in seeking advice worsens the prognosis. This is a most difficult question and one that obviously cannot be answered directly. In so far as longer history is associated, as we have shown, with tumours of a more advanced stage, which undoubtedly have a worse prognosis, then the answer is clear. A more detailed analysis, for which there is not space here, seems to show that for tumours of a given stage (as assessed both clinically and pathologically) the ones with a long history do no worse or better than those with a short history.

Mortality and Morbidity of Treatment

Mortality.—Four out of 338 patients died after radical mastectomy, a mortality of 1.2%. Three of these four deaths were due to massive pulmonary embolism. Of the 167 patients undergoing modified radical mastectomy only one died. One died after simple excision of the tumour and three after insertion of radium needles. Two of these last five deaths were due to massive pulmonary embolism, and two were due to pulmonary infarction following repeated embolism. Of the nine deaths in the entire series seven were therefore due to thrombo-embolic complications, with five deaths due to massive embolism.

Morbidity.—In the course of the analysis the question of treatment morbidity was investigated, special attention being directed to the problem of the swollen arm, limitation of shoulder movement, radionecrosis, and brachial plexus palsy. The first of these complications was the one in which we were most interested, particularly in trying to determine what part extensive surgery and radiotherapy play in its production. The true incidence of some complications may well have been higher than the notes reveal, and the severity of such a complication as oedema cannot be accurately estimated. It is possible that some of the original observers may have been more punctilious in recording the complications after certain methods of treatment. Notwithstanding all these factors, we believe the information collected to be of value.

Oedema of the Arm.—Surgeons are shy to admit responsibility for this complication and the radiotherapist is often blamed. Some surgeons indeed claim that they rarely see this complication after surgery alone. In Table VIII is

TABLE VIII.—Incidence of Post-operative Oedema

	Total No. of Cases	Cases of Oedema	
		No.	%
All surgery	734	87	12
Simple surgery*	229	11	5
Radical surgery*	338	48	14
Modified radical surgery*	167	28	17
Surgery with irradiation	446	52	12
" without "	288	35	12
Radical and modified radical surgery*	278	35	13
With primary healing	84	20	24
" sepsis or sloughs	65	13	20
" haematoma			

* With or without irradiation.

There were 78 cases with no record of the healing of the radical wound.

shown the incidence of oedema of the arm following different methods of treatment. The three different types of surgical procedure are listed irrespective of whether irradiation was also given, the proportion of irradiated cases being not greatly different in each group. There is no doubt about the significance of the lower incidence following simple surgery. In comparing the results for all methods of surgery alone with all methods plus irradiation the incidence of oedema of the arm is 12% in each group. A further factor of some importance in causing oedema of the arm is sepsis at the operation site; this was emphasized by Halsted (1921) many years ago. Table VIII also shows how the incidence of oedema of the arm was related to healing of the wound after radical or modified radical mastectomy. Oedema was twice as frequent in those cases developing haematoma, sepsis, or slough as those with uncomplicated healing.

Recurrences in the Treated Area

Among the whole series there were 297 (28%) for whom local recurrences were recorded; of these, 53% were in the first year, 74% within the first two years, and 91% within the first five years.

In analysing the incidence of local recurrences there are considerable difficulties. First there is the question of definition. We have not always found it possible to distinguish, from the records, between a tumour persisting after conservative treatment and a true local recurrence. In a retrospective inquiry there is clearly no way out of this difficulty. Then there is the problem of how to express the figures themselves. Smithers *et al.* (1952) recommend the use of the "recurrence-free rate," which is the percentage at any time who are alive and have suffered no local recurrence. This method does not, however, take into account the time of onset of the local recurrence, making no distinction, for instance, between two patients, both surviving for five years, one of whom has a recurrence in the first and the other in the fifth year.

Our somewhat tentative solution to this problem has been to devise a ten-year local recurrence index, which is defined as follows:

$$\text{Local recurrence index} = \left(1 - \frac{\text{Total completed recurrence-free years}}{\text{Total completed years of survival}} \right) \times 100$$

In calculating both these totals only the first ten years after treatment are taken into account; recurrence-free years are those between treatment and the onset of the first recorded local recurrence, irrespective of whether it was cured. An advantage of the index is that it is largely independent of the actual survival rate, and it is therefore possible to compare groups in which the proportions of the clinical stages are not the same.

Table IX shows the number of cases of local recurrence recorded after each form of treatment and also the local recurrence index. The high figures for x-ray and radium treatment are no doubt partly due to the confusion of persisting tumours with local recurrences. So far as the other methods are concerned, it will be seen that the lowest

TABLE IX.—Local Recurrences in Stages I-III

	No. of Cases	No. with Local Recurrence Within Ten Years	Ten-year Local Recurrence Index (%)
Simple surgery	55	20	16
{ Alone	63	27	14
{ With x rays	98	29	13
Radical "	180	37	6
{ Alone	143	30	8
{ With x rays	45	15	15
Modified radical surgery	48	10	9
{ Alone	67	14	15
{ With x rays	71	19	24
X rays alone	137	64	31
Radium alone			

This table excludes the untreated cases and the 6 cases treated with radical surgery and radium.

indices are for radical surgery, and that the addition of radiotherapy seems to have no appreciable effect.

All this is, however, somewhat speculative, and we should be unwilling to base any firm conclusions on these figures. The method is presented partly with the object of stimulating comment and criticism, for the subject is one that seems to have been neglected. Not only should consideration be given to the theoretical aspects of this problem, but, more important, a large series should be followed up with the specific aim of discovering the usual pattern of local recurrences and their effect on survival. We believe that, while the treatment of local recurrences may rid the patient of an obvious focus of disease, it may not in most cases be a means of prolonging life.

Discussion

The present series represents a group of cases treated long enough ago for us to be able to assess the long-term results. The fact that radiotherapy technique was neither so highly developed nor so widely accepted as at the present time suggests that the results obtained then should be bettered to-day.

The most impressive finding in this series is the remarkable similarity in survival rates following different methods of treatment. All the main treatment methods analysed seem to have been equally effective in stages I and II. It must, however, be frankly recognized that all methods of treatment may have been equally ineffective in prolonging life. While properly applied treatment has great palliative value it is important to ask to what extent treatment has affected survival. The only truly curable cases are those in which there is no distant spread at the time of the initial treatment, and complete eradication of the disease is probably not often achieved.

The advocacy of conservative surgery and radical radiotherapy by McWhirter (1948), although it has not yet met with universal approval, has encouraged many surgeons to take a much more critical view of their results. Some have been slow to appreciate the fact that the best results of radical surgery are due to selection of the most favourable cases, and it has not been easy for such people to accept a less radical doctrine. Great credit is due to McWhirter and the surgeons of the Edinburgh school, who have given the more reluctant amongst us the opportunity of watching a bold experiment. Even greater credit is, however, due to Geoffrey Keynes, who had the courage to adhere to a method of treatment which, 20 years ago, was regarded by most surgeons as totally inadequate.

The advocates of radical mastectomy, while conceding the point that a grossly diseased axilla is not benefited by dissection, believe that a real advantage accrues in those patients with minimal axillary gland involvement. But is this really so? Is it not possible that axillary and internal mammary lymph node involvement are of equally serious significance, and that, despite the seeming accessibility of the former, in neither instance is the disease truly curable? If this is in fact true, it may be the main reason why the results of simple surgery compare so favourably with those of the more radical procedure. The supporters of radical mastectomy may have attached too much importance to the removal of the axillary glands. Does their accessibility justify the assumption that their removal is advantageous to the patient? The possible advantage of axillary dissection in those patients with low axillary gland involvement may be offset by the frequent occurrence of extensive axillary disease which even the most experienced surgeon may not detect before operation.

The definite morbidity of radical mastectomy, and the fact that it seems to offer no greater survival rate, suggest that the time has come to ask whether this operation has more than a limited place in the surgeon's armamentarium. The only possible advantage we have adduced in favour of the radical operation is the lower local recurrence index when compared with simple surgery. However, many of the local recurrences in the simple surgery group occurred in those cases treated by simple excision of the tumour; and modern

radiotherapy and simple mastectomy might show up more favourably in this respect. It might be expected that a method of treatment which gives a low local recurrence index would also show a better overall survival rate. It is, however, possible that local recurrence *per se* is an infrequent source of distant metastases and that the appearance of the latter has been determined quite independently of the former. No firm decision can be given on this matter, and the subject is worthy of further investigation.

In the absence of facilities for modern radiotherapy it may be that the radical operation, confined to the most favourable cases, offers the best chance of cure and of preventing local recurrence.

Although we doubt the value of the radical mastectomy operation it is noteworthy that some surgeons, and more especially in the United States of America, have advocated even more radical operations involving removal of costal cartilages and excision of the anterior mediastinal glands. In our opinion such operations are unjustifiable and may in many cases be positively harmful to the patient. Some of the recent interest in this over-radical surgery has been due to the too literal interpretation of Handley's work by the enthusiastic surgeon. The anterior mediastinal glands are readily accessible to irradiation, and it would seem more reasonable to treat them in this way rather than to remove them by block dissection.

So far as the results of radiotherapy are concerned we are reluctant to draw conclusions from our own material. Owing to variations in technique during the decade in question, it has not been easy to show that radiotherapy increased the survival rate or lowered the incidence of local recurrence, although there are some indications that this was so. A carefully planned research would be necessary to elucidate this matter.

To determine a treatment policy suited to each individual type of case, although perhaps an ideal, is a difficult problem. Points about the case which are readily recognized after operation, and detailed examination of the pathological specimens, are not easily appreciated beforehand. To practise several variations in treatment is not always so easy or so logical as it seems. There are so many unknown factors to be taken into consideration that in these circumstances, and in the present state of our knowledge, a great deal can be said for simple mastectomy and radical irradiation in the majority of cases. Simple excision of the tumour and radiotherapy is a reasonable alternative in many elderly patients, and in some of the most careful clinical examination, supplemented by the necessary diagnostic x-ray investigation, should be continually emphasized as the only way to avoid unnecessary treatment for the patient with distant disease.

Summary

The purpose of the paper is to present an analysis of the results obtained in 1,044 cases of carcinoma of the female breast first seen at St. Bartholomew's Hospital during 1930-9.

Follow-up of all but 30 untraced patients was complete until May, 1951, enabling 10-year survival rates to be calculated for the whole series and 15-year rates for cases registered in 1930-5.

The distribution by clinical stages was as follows: I, 32.5%; II, 28.9%; III, 27.4%; IV, 10.2%; unstaged, 1.1%. Distribution by age and site of tumour was similar to that given in other published series.

Differences in clinical staging are not explicable only in terms of delay in seeking advice. Of cases with more than two years' history 31% were still in stage I, whilst 19% of those with a history of one month or less were in stages III and IV.

Pathological investigation of cases with axillary dissection revealed that the clinical assessment of the glands was wrong in 29% of stage I cases and 23% of stage II

We wish to express our gratitude to Mr. Reginald Vick, Mr. Geoffrey Keynes, Sir James Paterson Ross, and the other members of the staff of St. Bartholomew's Hospital who allowed us to undertake a study of patients who were under their care. Our thanks are also due to Dr. Christine Abernethy and Mrs. Perkins, who have both contributed to the completeness of the follow-up records, and to the staffs of the follow-up and statistics departments, on whom fell much of the routine work.

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The background of the cases must first be examined. The number of cases of breast carcinoma recorded with pleural or lung metastases from 1943 to 1950 was 159, and the number of cases with pleural or lung metastases, verified radiographically, was 127. Of these latter cases, oestrogens were prescribed in 61 and not prescribed in 66. The selection of cases for hormone administration was statistically random but not controlled. When the cases came to be analysed it was found that the proportion of cases of a younger age group was considerably higher in the untreated than in the treated group (Table VI). That this distribution did not influence the results is seen in the same table, where for each group the age of the patient was found to exert no influence on the length of survival. This fact is further commented on later.

TABLE I.—*Months of Survival in Treated and Untreated Cases*

Months Survival	Cases of Pleural Metastasis		Cases of Lung Metastasis		Total	
	T.	U.	T.	U.	Treated	Untreated
1-3	17	31	6	12	23 (5 still alive)	43 (all dead)
4-6	9	10	3	4	12 (4 " ")	14 (" ")
7-11	5	3	2	1	7 (2 " ")	4 (" ")
12+	9	4	10	1	19 (9 " ")	5 (" ")
Total ..	40	48	21	18	61	66

	Treated Group	Untreated Group
Died within 3 months ..	29.5%	65%
„ 4-11 months ..	21.5%	27.5%
Survival over 12 months ..	31%	7.5%
Still alive, 1-11 months ..	18%	—
	100%	100%

Mere survival over 12 months is unusual enough, in cases of lung metastasis, to the clinician who sees large

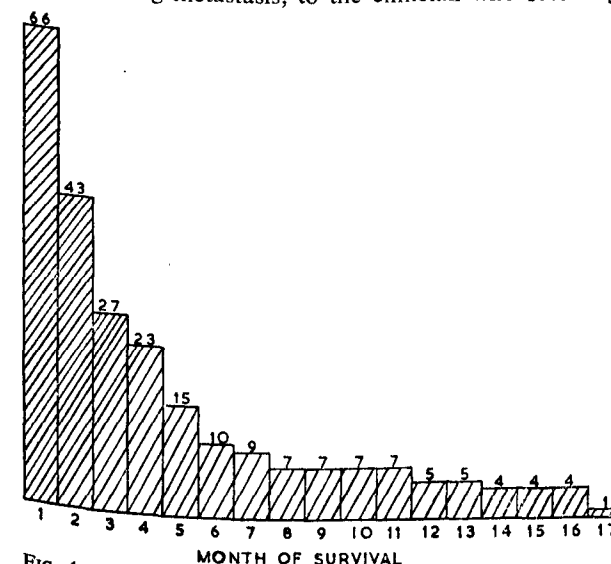


Fig. 1.—Numbers surviving month by month after diagnosis of metastasis. Untreated group, 66 cases.

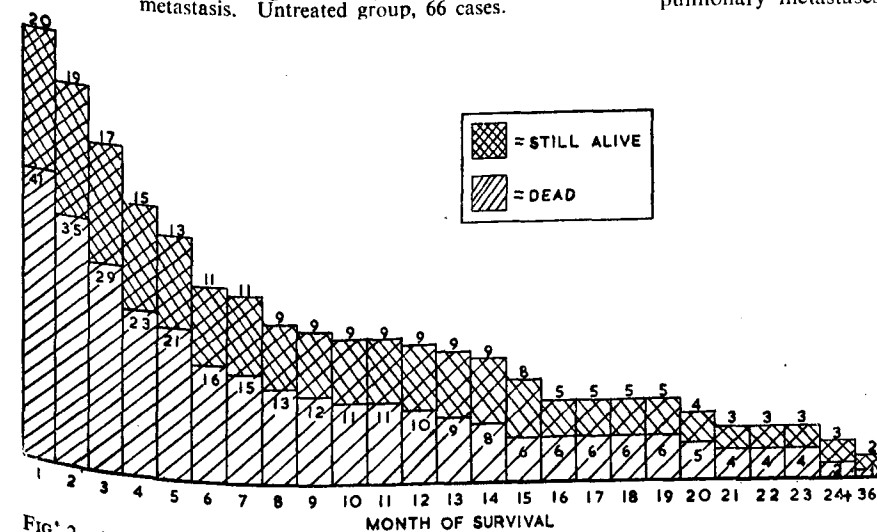


FIG. 2.—Numbers surviving month by month after institution of oestrogens for metastasis;
61 cases

TABLE III.—Regression of Pulmonary Metastases Following Oestrogens

Lesion	Total Cases	Cases Surviving 12 Months	Cases with Radiographic Regression
Lung metastases	21	10	7
Pleural " "	40	9	9
Total	61	19 (31%)	16 (26%)

months or more after oestrogen therapy include 10 out of 21 cases of lung metastases and 9 out of 40 cases of pleural metastases. In the former group 7 out of 10, and in the latter group 9 out of 9, showed radiographic evidence of regression of metastases. Such regression develops after two to four months in the majority, but in some cases there was evidence of new lung or pleural metastases after 12 months. There was evidence of regression of pulmonary metastases also in a further three patients who are still alive but who have not completed 12 months' survival. The total of cases showing radiographic evidence of regression is thus 16 out of 61 cases (26%). When we compare the untreated group we find that, although 5 cases out of 66 survived over 12 months, in no case was there evidence of regression of pulmonary metastases.

The dose prescribed was, in the main, either 2 or 20 mg. of stilboestrol daily, according to the random choice method advocated by the Oestrogen Research Committee set up by the British Empire Cancer Campaign and Royal Society of Medicine.

Table IV shows that of the 39 patients who had taken the drug for three months or more, 57% survived seven months or longer. Of the 22 taking the drug for two months or less, 18% survived over seven months. It would appear from these figures that with more prolonged administration of oestrogens the results are better. In spite of this it must be recalled that it was previously noted that regression of

TABLE IV.—Duration of Oestrogen Administered in Relation to Survival

Duration of Oestrogen	Total Cases	Cases Surviving over 7 Months
Over 3 months	39	22 (57%)
Less than 3 months	22	4 (18%)
Total	61	26

pleural effusion occurred in some cases after administration of oestrogens for two months. It must therefore be assumed that two months is adequate to establish a reaction capable of controlling the disease. It might be relevant to recall at this point that recognizable regression of soft-tissue metastases in breast carcinoma usually occurs after three months' administration of oestrogens (Stoll, 1950).

With regard to the optimal dose of oestrogen, it is seen from Table V that of the 26 cases receiving 2 mg. daily, 35% survived over seven months. This compares with 35 cases receiving 20 mg. daily, of whom 49% survived over

TABLE V.—Dose of Oestrogen in Relation to Survival

Dose of Oestrogen	Total Cases	Cases Surviving over 7 Months
2 mg. daily	26	9 (35%)
20 " "	35	17 (49%)
Total	61	26

seven months. The difference between the two groups is not significant, suggesting that the lower dose is sufficient to exert the maximal possible effect. This is in agreement with the effect of oestrogens on soft-tissue metastasis noted in the previous paper, but does not agree with some other authorities. Walpole and Paterson (1949) noted a better result with 20 mg. of dienoestrol or stilboestrol daily than with 1-2 mg. daily. It must be noted that the oestrogenic potency of dienoestrol is one-fifth that of stilboestrol, and thus the smaller dose of dienoestrol would be equivalent to about 0.25 mg. of stilboestrol daily—a dose which may be quite insufficient.

Effect on Concomitant Soft-tissue Metastases

In 29 of the treated cases there were signs of active growth involving the soft tissues—that is, skin or glands. In only eight of these cases were there signs of regression in these metastases, but five of these survived over 12 months in spite of pulmonary metastases. There is therefore some degree of correlation between the response of the two types of metastasis to oestrogens.

Survival in Relation to Age Group

As noted before, the proportion of cases of a younger age group was considerably higher in the untreated group than in the treated group. In order to assess what possible bias effect this might have on the comparison of the two series, Table VI was planned.

It is seen from Table VI that in the treated group the seven-months survivals in the under 59 and over 60 group

TABLE VI.—Survival in Relation to Age Group; Treated and Untreated Cases

Months Survival	Under 59 Group		Over 60 Group		Total	
	T.	U.	T.	U.	T.	U.
1-3	7	27	16	15	23	42
4-6	7	12	5	1	12	13
7-11	5	3	2	1	7	4
12+	6	3	13	2	19	5
Total	25	45	36	19	61	64*

* Plus two cases, age unknown.

are 44% and 42% respectively. In the untreated group the seven-months survivals are 13% and 16% respectively for the two age groups. There is thus no obvious difference between the age groups in the expectation of life in either treated or untreated groups, and therefore the inequality of the age distribution does not vitiate the value of the control series.

It is of interest to note that in the case of soft-tissue metastases there is generally agreed to be a notable difference between the under 60 and the over 60 age groups in their response to oestrogens. The Royal Society of Medicine symposium in 1944 quoted 14% and 40% regression respectively.

Possible Prophylactic Effect of Oestrogens

In spite of the proved value of oestrogens in the treatment of pulmonary metastases from breast carcinoma, there is no evidence that they exert any protective effect against the development of such metastases even during their administration.

In the period under review 147 patients for whom oestrogens were prescribed for breast carcinoma showed no evidence of pulmonary metastases at the time of prescription. In 41 of these pulmonary metastases developed at a later date (in 15 cases while the patient was taking oestrogens), in 13 within three months of stopping oestrogens, and in a further 13 more than three months after stopping oestrogens. While no prophylactic effect is shown by these figures, there is no suggestion that oestrogens can be incriminated as precipitating pulmonary metastases.

Discussion

Relevant to the regression of pleural effusions in these cases, associated with long-term survivals, it would be useful to discuss the other possible causes, apart from metastases, which might lead to such effusions. The main possibilities are (a) idiopathic effusion—usually tuberculous; (b) effusion as a reaction to irradiation of the thorax; and (c) hydrothorax as a complication of cardiac or renal disease. All these may lead to an effusion which can regress spontaneously.

The differential diagnosis of a malignant effusion depends on certain features. The effusion is said to be blood-stained, but this is not always so, because the fluid may be a transudate following pressure on the pulmonary veins by metastatic mediastinal glands. The presence of neoplastic cells in the fluid is diagnostic, but notoriously difficult to establish. Associated haemoptysis is occasionally noted, and indicates underlying lung involvement; and, indeed, deposits in the lung may often be shown by a radiograph to coexist, or they may develop later. Involvement of the opposite side in the case of unilateral lesions is a more or less inevitable result. The development of spontaneous hydropneumothorax (as seen in two cases in this series) suggests the rupture of a subpleural metastasis in the lungs.

The clinical picture of the patient with malignant effusion is usually typical. A sudden onset of dyspnoea is frequently associated with a very small effusion, the degree of dyspnoea often being apparently out of proportion to the size of the effusion. A malar flush is common and may be due to the cyanosis, but is often associated with a degree of pyrexia. Essentially, however, the diagnosis of malignant effusion is presumptive upon the history of breast carcinoma and must be regarded as such unless proved otherwise.

The possibility of pleural effusion resulting from radiation changes must be considered. Although depending on the technique used for irradiation of breast carcinoma, radiation changes in the lungs are not infrequent. As a rule they develop six to nine months after a course of irradiation and usually lead to lung fibrosis, which may persist unchanged for years. Occasionally a transient patch of pneumonitis may develop, mostly soon after treatment. The site of the changes is typical for the irradiation technique used and

TABLE VII.—Site of Effusion in Relation to Site of Primary Breast Tumour

Site	Cases in Untreated Group	Cases in Treated Group	Total
Ipsilateral	36	33	69 (80%)
Contralateral	8	4	12 (14%)
Bilateral	3	2	5 (6%)
Total	47	39	86

In two cases the side was unspecified.

TABLE VIII.—Survival in Relation to Date of Previous Irradiation in the Case of Ipsilateral Effusions

Months Survival	Months since Last Irradiation of Same Side of Chest				Total
	1-11	12-23	24+	No Irradiation	
1-3	15	8	4	8	35
4-6	7	4	1	5	17
7-11	3	1	—	1	5
12+	1	3	3	5	12
Total	26	16	8	19	69

corresponds to the junction of the supraclavicular and tangential fields in the cases treated in the London Hospital radiotherapy department. Pleural effusion is almost never associated with the lung changes, although in 2 out of the 68 cases of effusion in this series there were signs of apical lung fibrosis antedating the development of the effusion by some months.

In an attempt to clarify any relationship between the pleural effusion and the antecedent irradiation, Tables VII and VIII were planned.

Table VII shows that of the 86 cases in which the primary site of effusion is specified, in 80% the site was ipsilateral to the original breast lesion, in 14% contralateral, and in 6% bilateral. When only 19 previously non-irradiated cases are considered the proportion of ipsilateral effusion is 74%, suggesting that ipsilateral effusion is the common result of malignant metastases.

Table VIII shows that 26 out of the 69 cases of ipsilateral effusion developed within 11 months of irradiation being given to that side of the chest. If pleural effusion is a complication of irradiation one might suspect this group of cases, and, if so, it should provide the cases of regression and long survival. In actual fact, 22 out of these 26 patients did not survive six months, and only one survived over 12 months.

We consider that the most conclusive evidence that the effusions were malignant in this series is the death within 17 months of all the patients in the untreated control series.

A final observation is presented on the radiographic appearance of lung metastases from breast carcinoma. Of the 39 cases in the series, 23 presented with a single rounded opacity or multiple mottling in one or both lung fields; nine with lymphangitis carcinomatosa with reticulation throughout the lung fields and increase in the size of the hilar shadow; five with hilar gland enlargement alone; and two with a localized area of collapsed lung with later evidence of further lung involvement.

Regression of lung metastases from breast carcinoma by the use of oestrogens has been quoted by Paterson (1950). There was regression in two out of seven cases.

Case Histories

There were 10 patients with lung metastasis (apart from the nine cases of pleural metastasis) who survived over 12 months. Their case histories are appended.

Case 1.—Aged 67; post-menopausal. October, 1944, history of left mastectomy 23 years before. Patient attended with carcinoma of the right breast. November, 1944, deep x-ray treatment of right breast. November, 1945, radiograph showed multiple rounded shadows in the left lung field; stilboestrol, 5 mg. q.i.d., prescribed. April, 1946, lung metastases fading and stilboestrol stopped. January, 1947, metastases fading and also left pleural effusion; stilboestrol restarted and continued. June, 1947, increase in effusion and spread of left lung metastases. October, 1947, patient died, 23 months after original lung metastases.

Case 2.—Aged 66; post-menopausal. July, 1948, attended with ulcerated carcinoma of right breast and fixed axillary glands. October, 1948, radiograph showed multiple rounded shadows in both lung fields (Fig. 3); stilboestrol, 0.5 mg. q.i.d., prescribed and continued. January, 1950, deep x-ray treatment of right breast in view of response of lung metastases. July, 1950, partial regression of lung metastases (Fig. 4). February, 1951, patient alive and slightly dyspnoeic on exertion, 28 months after the original lung metastases.

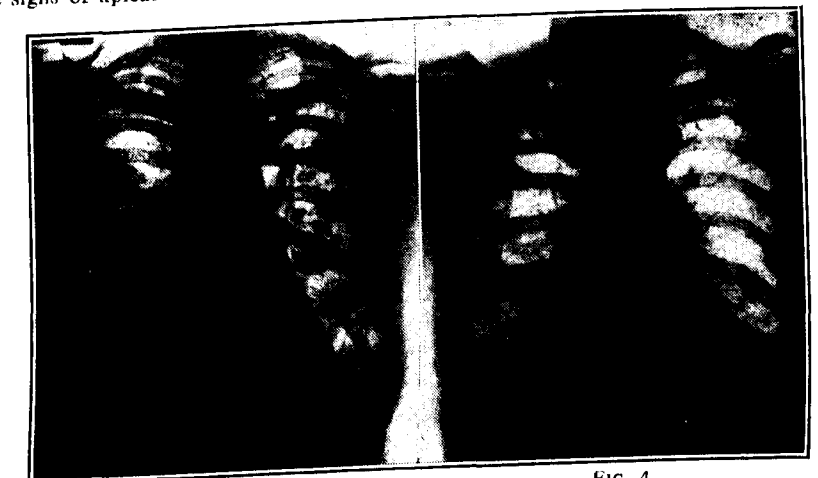


FIG. 3.

FIG. 4.

FIG. 3.—Case 2. Radiograph taken on October 1, 1948, showing multiple rounded shadows in both lung fields. FIG. 4.—Case 2. Radiograph on July 12, 1950, showing partial regression of lung metastases.



FIG. 5.

FIG. 6.

FIG. 5.—Case 7. Radiograph on February 28, 1950, showing multiple rounded opacities in mid-zones of both lungs. FIG. 6.—Case 7. Radiograph on February 2, 1951, showing partial resolution of lung opacities.

Case 3.—Aged 53; post-menopausal. April, 1945, right mastectomy followed by deep x-ray treatment for breast carcinoma. January, 1947, right supraclavicular metastases treated by deep x rays. October, 1947, radiograph showed prominence of both hilar shadows and reticulation in the lung fields, diagnosed as lymphangitis carcinomatosa. January, 1948, stilboestrol, 5 mg. q.i.d., prescribed and continued; deep x-ray treatment given to pelvic metastases. August, 1949, decrease in size of hilar shadows, and lung fields appear clearer, although right diaphragm now raised. January, 1950, patient died, 27 months after the original lung metastases.

Case 4.—Aged 52. October, 1945, right mastectomy for breast carcinoma. January, 1946, radiograph showed rounded shadow at right costophrenic angle; stilboestrol, 0.5 mg., prescribed and continued for 14 months. April, 1946, deep x-ray treatment to mass on right chest wall. March, 1947, deep x-ray treatment to left supraclavicular metastases. July, 1947, shadowing at right base unchanged. In addition there was a right interlobar and left basal effusion, and generalized increase in lung markings. September, 1947, patient died, 19 months after the original lung metastases.

Case 5.—Aged 75, post-menopausal. December, 1945, attended with carcinoma right breast. January, 1946, deep x-ray treatment to right breast and glandular areas. June, 1947, radiograph showed bilateral hilar gland enlargement; stilboestrol, 5 mg. q.i.d., prescribed and continued. February, 1951, radiograph showed clearing of hilar shadows; patient alive 44 months after original mediastinal metastases.

Case 6.—Aged 65; post-menopausal. March, 1948, right mastectomy for breast carcinoma. August, 1948, post-operative deep x-ray treatment to right chest wall and glandular areas. December, 1949, radiograph showed multiple rounded opacities in both lung fields. January, 1950, deep x-ray treatment to right supraclavicular metastases. December, 1950, stilboestrol, 0.5 mg. q.i.d., prescribed and continued. March, 1951, radiograph showed no change in lung shadows. May, 1951, patient alive 17 months after original lung metastases.

Case 7.—Aged 71; post-menopausal. July, 1947, right mastectomy for breast carcinoma. November, 1947, post-operative deep x-ray treatment to right chest wall and glandular areas. February, 1950, radiograph showed multiple rounded opacities in mid-zones of both lungs (Fig. 5); stilboestrol, 5 mg. q.i.d., prescribed and continued for seven months. February, 1951, radiograph showed partial resolution of lung opacities (Fig. 6). April, 1951, patient alive 14 months after original lung metastases.

Case 8.—Aged 59; post-menopausal. September, 1949, attended with carcinoma right breast and fixed axillary glands; radiograph showed rounded multiple opacities in both lung fields. November, 1949, deep x-ray treatment to right breast. February, 1950, stilboestrol, 0.5 mg. q.i.d., prescribed and continued. April, 1951, radiograph showed partial resolution of lung opacities. May, 1951, patient alive 20 months after original lung metastases.

Case 9.—Aged 66; post-menopausal. August, 1949, attended with carcinoma left breast and fixed axillary glands; stilboestrol, 5 mg. q.i.d., prescribed and continued. October, 1949, deep x-ray treatment to left breast and glandular areas. February, 1950, radiograph showed bilateral hilar gland enlargement with extension into lung fields; diagnosed as lymphangitis carcinomatosa. June, 1950, shadowing on right side cleared after four months. October, 1950, testosterone, 800 mg. monthly, prescribed for ulceration of left breast which was not responding to stilboestrol. April, 1951, radiograph showed decrease in left lung infiltration; breast ulceration regressing on testosterone. May, 1951, patient alive 15 months after original lung infiltration.

Case 10.—Aged 47; cyclical. October, 1943, deep x-ray treatment to carcinoma right breast with multiple skin nodules. December, 1944, radiograph showed opacity in

right lower zone, ? nature; this increased slowly in size. July, 1946, stilboestrol, 5 mg. q.i.d., prescribed and continued for 13 months. December, 1947, radiograph showed no new opacities; stilboestrol stopped. June, 1948, radiograph showed multiple opacities in right mid zone, left basal effusion, and radial shadowing suggesting lymphogenous spread; stilboestrol restarted. November, 1948, patient died, 47 months after original lung shadowing.

Summary

A report is made on 61 cases of pleural or lung metastasis secondary to breast carcinoma treated by oestrogens. A series of 66 similar cases which were not treated is used for comparison.

In the treated group 31% of cases survived over 12 months, as compared with only 7.5% in the untreated group. In the treated group 26% of cases showed regression of pulmonary lesions, compared with 0% in the untreated group.

The possibility of a non-malignant aetiology in the cases with long survival is discussed.

The effect of oestrogens in these cases is essentially temporary, and no prophylactic effect against the development of pulmonary metastases can be shown.

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TEN YEARS' CLINICAL EXPERIENCE OF MODIFIED LEUCOTOMY OPERATIONS*

BY

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It is over 10 years since some of us, evacuated to Sutton Emergency Hospital from the Maudsley Hospital during the last war, decided to approach Mr. Wylie McKissock, of St. George's Hospital, about attempting modifications of the standard leucotomy operation, then being used in America by Freeman and Watts, so as to investigate its possibilities in the treatment of selected neuroses. I had already seen some results of the early full standard leucotomy in Washington in 1938, and it was obvious then that this operation would come to be used in the neuroses, but cuts would have to be modified, if possible, to try to prevent some of the sequelae seen in these patients. A little later on Mr. G. Knight also offered to help in such work at the West End Hospital for Nervous Diseases.

Experimental Work

Our earliest experiments were not as satisfactory as one would have desired. We were able to do some at our own hospital, but in those days permission to perform such operations had to go through varied L.C.C. and E.M.S. administrative channels, and viewpoints could be so conflicting that varied makeshifts had often to be employed to enable them to take place at all, even on the most carefully selected and studied patients.

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These sometimes had to be transferred for operation officially to the neurosurgical units of voluntary hospitals, where more freedom of action existed, but this meant also that they then had to go straight home, often the end of a fortnight, and be followed up as well as possible as out-patients. However unsuitable this was for research purposes, recent developments have made an earlier work well worth while, for it has enabled us to have interesting follow-ups of up to 10 years' duration in cases of neuroses with limited cuts, and as the atmosphere has become progressively more favourable to this work about 80 neurotic patients have now been operated on at Sutton (recently renamed Belmont Hospital) out of the many thousand admissions there, and ten months have been spent before or after operation, necessary, in studying the individual cases in hospital. In the past four years it has also been possible to work with Mr. Harvey Jackson at St. Thomas's Hospital on the use of other modified forms of operation in the neuroses and to explore their value in yet another field—the so-called "psychosomatic" disorders. We can hope that some of the results obtained (Sargent, 1951) will make this work at least as acceptable in the next 10 years as the use of modified procedures has come to-day in the ordinary neuroses.

I think English clinicians may truly claim to be among the early workers in this field. Dax (1949) and Radley (1949) were beginning to experiment with modified cuts in cases of psychoses in 1942, as we were in cases of neuroses. By 1944 Slater and I were already able to say, as a result of our early findings, that "for each patient the minimum of brain tissue must be destroyed at will produce the desired clinical effect," and that the operative skill of the surgeon is required to ensure that the operation is not so extensive and destructive as to produce unnecessary and undesirable sequelae. It is also possible to outline some of the more obvious clinical indications and contraindications resulting from our earlier work (Sargent and Slater, 1944; Sargent and Stewart, 1947).

The "Post-leucotomy Syndrome"

However, at the end of the war it still seemed generally accepted in America that extensive cuts and post-operative confusion were necessary in order to obtain satisfactory results, and workers, such as Rylander (1948) in Sweden and others in this country (Ström-Olsen and Tow, 1949), were still subjecting cases of neuroses to full and often posterior "standard" operations. Such operations were taking a quite needless toll of a neurotic patient's remaining personality. Unfortunately, it is the published and understood findings of some of these workers that still provide the major ammunition for the hostile criticisms of this operation in the medical and lay press alike. As a result, it is generally necessary to reassure neurotic patients and their relatives that such methods have been abandoned as a routine measure for many years now at centres specializing in neuroses in England.

An independent follow-up study of 30 patients operated on at Sutton eighteen months to eight years previously (Sargent and Minski, 1951) showed, in fact, that no so-called "post-leucotomy syndrome" common to the group as recognizable as such, and the view was expressed that the findings of others in this respect were possibly due to persistence of previous personality defects or disease symptoms, or because the cut had been made too far posteriorly in other anatomically undesirable areas. Rylander (1952) has also confirmed that, with undercutting of the lower quadrants only, no undesirable personality changes were found in a careful follow-up of his patients. Without hesitation or equivocation, one can now say that it is wrong

to subject the ordinary run of neurotic patients, and many psychotic patients for that matter, to a routine full standard operation till modified procedures have been tried first.

Modifications of Procedure

Since 1942 it has been possible to work with four British surgeons on various modified procedures and to see the work of many others in the U.S.A. All sorts of modifications have been attempted in selected patients, including full sweeps involving both the upper and lower quadrants of the frontal lobe done further forward, and section of the lower quadrants only, first used by McKissock in 1943.* Transorbital leucotomy was done on one of my patients while I was in the U.S.A. in 1948, and I saw the results in other cases. In the same year an open "rostral" type of leucotomy was also carried out by Mr. Guy Odom at my request at Duke University, and Mr. McKissock has been doing both open and closed rostral and medial quadrant operations at Belmont Hospital in recent years. In the past four years at St. Thomas's, special attention has again been paid to section of the lower quadrants by Mr. Harvey Jackson in the neuroses and psychosomatic states. Deteriorations resulting from full cuts have been seen for comparison from time to time and when the operative results from other workers have been examined, or complications have occurred, and also when a surgeon has obviously misplaced the cut in too posterior a manner—a greater or less risk that must still unfortunately be reckoned with in all decisions on whether or not to operate in a particular case by any particular method.

It is no longer as easy to believe those who have suggested that the thing that really matters is the quantitative amount of brain damage done in the prefrontal lobe rather than its actual site. My own clinical impressions increasingly support Fulton's (1952) work on animals, that the more you keep to the region of the inferior medial quadrant the safer you are. The further one ventures from this area the more likely is one to run into undesirable sequelae, though the farther forward the damage the better. Especially with broad foreheads, cutting the fibres in this area by a lateral approach may be difficult unless special techniques are employed, and many patients still showing tension after an apparently full cut may be, in fact, those in whom important fibres in this quadrant have unfortunately been missed. Many reoperations on this quadrant may have to be performed in the future when this fact is more generally realized.

Quantitative factors in the cut are also very important, but I believe it will be finally shown that to obtain the best clinical results with the minimum of undesirable sequelae in neuroses the site of the operation is more important still. This may be the reason why Freeman's new deep frontal cut, using the transorbital route (Freeman and Watts, 1950), is apparently achieving many successes in the U.S.A., since it produces its maximum damage in just this lower medial area of the frontal lobe. There are also far fewer psychotic patients than is generally supposed who need to pay the price of a full posterior cut for their release from a mental hospital, though the deliberate production of emotional blunting is necessary in some. Greenblatt and Solomon's (1952) findings in the U.S.A. with what is termed "bimedial leucotomy" should be carefully studied in this respect.

Clinical Selection of Patients

The use of these limited cuts has, of course, entirely transformed the clinical possibilities of leucotomy. One can now promise the properly selected patient that, barring accidents, he will certainly not come to great harm, though total relief of distressing symptoms may not be as dramatic

*One of these patients operated on then, at the age of 68, is still enjoying a hale, hearty, and happy old age at 78, without any recurrence of his chronic tension state and attacks of severe recurrent depression. He remains a regular attendant and a sidesman at his church, an equally regular attendant at his bowling club, and recently won two first prizes at three consecutive whist drives.

and certain. With increasing surgical skill and modified operations, these accidents are becoming relatively fewer, and, like death from the operation, because of their increasing rarity need not now weigh too prominently in the final decision. Provided the right clinical indications are present, operations can be performed, if necessary, in intractable psychosomatic states, in anxiety hysteria, and in anxiety and depressive states in obsessive personalities. Such patients will also often do much better than severe obsessives where a more extensive operation may be necessary, as in the chronic psychotic, to remove symptoms making life so intolerable. One finding has been consistently true in the past ten years: the more worried you become about subjecting a well-preserved neurotic patient to a modified leucotomy because the basic personality remains good, the better he will do. Your unhappy results will be in those on whom you have recommended an operation more lightly because their personality is not so well-preserved and there is so much the less to lose. Some hospitals get disappointing results because they choose patients from among their worst clinical material rather than their best, even after all other methods have failed to help the patient, and he or she remains totally incapacitated by illness.

When using restricted cuts in the neuroses there are certain principles that still have to be observed to avoid disaster, apart from those already mentioned. One must be constantly on the look-out for schizophrenic features hiding under the presenting picture of an obsessional neurosis. For in partially relieving the obsessional component by operation you may be simply facilitating the emergence of more incapacitating schizophrenic thought disorder. There is no need to be worried by the presence of secondary hysterical features in the total presenting picture, provided they are being released only by underlying anxiety or obsessive tension. The malignant hysteric without anxiety and obsessive features probably does as badly, however, as the chronic hebephrenic. But in long-term follow-ups some good results will occur in chronic phobic states in mixed hysterical and obsessive patients. It is wise to pay special attention to body build, for the results in those of good muscular physique will be generally more satisfactory than in the constitutional asthenic. One should be very cautious in all states of psychopathy, or where paranoid features are deeply rooted in the basic personality rather than being merely part of a recent illness. One need not be too worried by symptoms of ill-temper which are found to be due solely to underlying tension resulting from the illness itself and do not occur when the patient is relaxed. But it is wise to avoid those patients in whom a quick temper is part of their normal constitutional endowment and which occurs without much tension, and in a total setting so frequently seen in the explosive psychopathic patient. In selecting neurotic patients for operation, one must always try to estimate what personality assets will remain if tension and obsessive thinking are diminished. In some patients this may be beneficial and in others harmful to their future social adjustment. If they are already impulsive and lacking in foresight the operation may make them more so, but there are so many other patients totally unable to live at all in the present because of numerous anxious preoccupations with the past and future. These can be made more normal by modified operations.

Finally, in choosing patients for modified leucotomy operations one should have available all other methods, such as psychotherapy, drug abreaction, intravenous acetylcholine therapy, E.C.T., modified insulin, and skill in the use of routine sedation in the hope that operative measures may be avoided. Many of the results obtained at Sutton and at St. Thomas's have been good because all other methods were available for trial first and a long period of preliminary study as an in-patient could be undertaken when necessary.

Psychological Testing

A word should be said about psychological testing as opposed to clinical psychiatric examination in the selection

of patients for these modified procedures and in assessing results. One can only beg competent clinicians not to rely too much on such tests at the expense of their mature clinical judgment, otherwise clinical perspectives can become distorted. The criterion of success or failure is best measured by whether the patient and the relatives are pleased or displeased, and by the subsequent work record and social and ethical adjustments shown. We do the operation for social and personal reasons, and not because a theoretical I.Q. may rise or fall a point or two, or some selective psychological testing shows what may prove to be an unimportant change socially for the patient concerned. I for one have now abandoned routine psychological testing, till further progress is made, in favour of clinical assessment, except in certain circumstances. For instance, it is somewhat useful to check the I.Q. before operation, because those with higher I.Q.s will generally do better than those with the lower ones. A Rorschach test in skilled hands may also detect latent schizophrenic features missed in the most careful clinical examination, which may prove a contraindication in the young obsessional patient. For follow-up purposes I prefer clinical and social assessment to reliance on tests, which so often fail when they are most needed in assessing emotional rather than intellectual alterations that may have occurred.

Problems of Relapse

With the increased use of modified operations one is faced with the important problem of relapse. Recently one has occurred with a reasonably full cut as late as nine years after operation and an intervening period of good health. Some are also occurring four to five years after operation, and others have happened in as early as a month. Relapses occur with all types of operation, but in the case of modified techniques further improvement may often be obtained by reoperation, still without resorting to too posterior a cut. We have had several successes with reoperation when satisfactory improvement has been followed by relapse. Many years may also have passed between operations, but reoperation still helps.

One obsessional patient had his first operation in 1943, confined to the lower quadrants; he was generally improved for three months and then relapsed. It was not until 1948 that he was persuaded to have a more extensive cut, and he has since maintained his improvement. Another patient also had his first operation in 1943, relapsed, and was quickly reoperated upon; he was then able to stay at work till a recent follow-up revealed that he had again relapsed in 1951; the possibilities of his further treatment are now being explored. A patient with chronic tension, with an anterior total sweep at operation in 1947, relapsed in 1951, and had a second operation in 1952, again with benefit, but this time the second operation was confined to the medial quadrants only. I am noticing less tendency to relapse in lower-quadrant cuts done by Mr. Harvey Jackson recently, compared with those attempted in earlier years, possibly because we are now paying more attention to the inner quadrant than formerly. This finding would bear out recent observations by those doing open operations in this area in France, England, and the U.S.A., but we need a longer time to be certain on such points.

Social and Religious Considerations

On these matters, too, one can be most definite after ten years. If anterior and limited cuts are used conventional religious and ethical values are rarely irrevocably lost. Fanaticism on any topic may no longer be as easy to maintain, but more balanced points of view on religious and social issues are again made possible to the patient. Several of my patients have certainly had their religious faith heightened with the healing of their minds and a better ability to think of things beyond their own immediate and intense personal suffering. One patient has had two episodes of religious reawakening after each operation, which has also helped him on each occasion to attain better social adjust-

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ANAL FISSURE

BY

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An anal fissure is a triangular ulcer at the anal verge, extending into the anal canal. The lesion is often associated with severe pain, and when untreated tends to run a course of exacerbations and remissions.

Aetiology and Pathology

The fissure begins as a tear at the anal verge. This tear might be caused by the passage of unusually large or hard faeces (sometimes enema tubing) or may be related to temporary incoordination of the external sphincter, with slow relaxation of the subcutaneous part. The elliptical shape of the superficial portion of the external sphincter leaves vulnerable the midline posteriorly, and hence the fissure is nearly always in this position. The anterior fissure is seen almost exclusively in the female, and is due to the unprotected anterior segment.

A fissure is about 2 cm. long and 1.5 cm. wide, and the apex extends just above the anal intermuscular septum, to overlie the lower border of the internal sphincter. At first the fissure is uncomplicated. The floor contains longitudinal fibres of the corrugator ani muscle. Their presence indicates the shallow depth of the ulcer and a likelihood of healing without surgical intervention. If a skin tag ("sentinel pile") be present, it is small. There is no induration of the base, but the fissure is extremely tender and associated with much sphincter spasm.

This spasm prevents the ulcer from healing. It deepens, and the floor is then formed by circular fibres of the subcutaneous portion of the external sphincter. The skin tag is often large and oedematous; at the proximal end of the fissure the mucous membrane becomes polypoidal. This secondary mucosal polyp is found in a high percentage of chronic anal fissures. The edges of the ulcer are well defined and overlap the floor of the ulcer, so that the true size is concealed. Infection is an important complication of the fissure. The inflammation is localized and may end in suppuration, with abscess formation; this usually discharges into the anal canal to form a blind internal fistula. Much less often the abscess discharges on to the perianal skin, with the formation of a low anal fistula.

Clinical Features

Males and females are affected with equal frequency. The pain is described as burning, shooting, or aching in nature, and is related to defaecation; sometimes the act is extremely painful, but more often the pain begins half an hour after and drags on for another hour or two.

Therapeutic Persistence

I would also like to stress the need for therapeutic persistence and the use of all methods before too deteriorating procedures are finally decided upon or the too ready throwing of one's hand when confronted with difficulties after a modified leucotomy. One patient with a very severe obsessional neurosis had had 15 years of psychoanalysis and supportive therapy on and off before faith was finally lost by both patient and therapist alike in this approach, and a modified leucotomy agreed to. This resulted in some relief of tension but a release of severe paranoid and depressive symptoms. These complications then had to be dealt with by the giving of insulin and E.C.T. A second operation, still confined to the lower quadrants but farther back, relieved further tension, but obsessional thoughts persisted. She is now being treated as an out-patient with intravenous acetylcholine injections and occupational therapy, where some might have decided that after the failure of so much psychotherapy, the first leucotomy, and the complications that ensued there was nothing more to be done; especially as a full operation was thought to be contraindicated in this particular patient because of certain personality traits. If one's operative efforts are not irretrievable it always leaves hope that other measures, short of deteriorating cuts, may be effective which would have failed before. Thus some phobic states may be further helped by intravenous acetylcholine injections after the edge has been taken off the patient's anxiety by modified leucotomy; and treatment with E.C.T. and insulin may become effective in depressives and schizophrenics where it has failed before. We have seen several examples of this. In addition, a reasonably intact personality is still preserved. Time for further psychotherapy can also be gained.

Conclusion

I must finally pay my very grateful tribute on behalf of all psychiatrists here to the many neurosurgeons in England for all the patience and co-operation they have shown us in our often stumbling and hesitant efforts for the relief of mental suffering by a method which is as yet obtaining only a hazardous social and medical respectability. I am certain, however, that a large number of psychiatric patients would echo these thanks. They and their families should be the real judges of our success or failure, and not our own theoretical prejudices and emotionally toned judgments. Psychiatry often creates insoluble difficulties for itself when we leave the patient's bedside and become too involved in speculative philosophical issues. If we are only content to remain doctors, constantly searching for new and better practical ways of trying to help our individual patients, the future of leucotomy is assured—at least until better ways are discovered for the practical relief of so much persistent individual human misery and social incapacity.

Passage of blood with the motions is alarming to the patient even though it is slight in amount; it is usually observed on the toilet paper as well as on the motion. If the patient has associated haemorrhoids their prolapse might be, to the patient, the obvious cause of the discomfort.

The fissure can always be seen without subjecting the patient to the agony of rectal palpation. The buttocks are firmly parted and the anal verge inspected; this in turn is gently opened with the index fingers of each hand. If the surgeon has secured the confidence of his patient the subcutaneous sphincter will relax to reveal the fissure in most of its length and the surgeon can see the floor without difficulty. Palpation must often be confined to the perianal region, searching for evidence of deeper infection, but in the more patulous type of anus it is possible to push the finger upwards along the anterior segment, and, gently turning the finger, palpate the upper end of the fissure for a polyp while the base of the fissure can be felt between the forefinger and thumb.

Proctoscopy and sigmoidoscopy should not be attempted at this stage. Carcinoma of the rectum and sigmoid practically never coexist with an anal fissure, although they are excluded by subsequent sigmoidoscopic examination.

Treatment

The treatment advised will depend upon the type of fissure, the nature of the patient, and the preference of the surgeon.

1. Conservative Treatment

A small number of cases respond to conservative measures. The bowel habit is regulated by adjusting the diet and by prescribing aperients, particularly paraffin oil. Just before the bowel action the patient passes into the rectum a finger lubricated with an ointment containing a surface analgesic, such as cinchocaine 10%. Acute fissures, which are shallow and contain longitudinal fibres in their floor may respond to such treatment, but even in these the outcome is unpredictable. Further, some patients are sensitive to cinchocaine and other such ointments and develop a rash around the anus, whilst others are disturbed by the pain and by the slowness of the cure and seek more active measures.

2. Injection

Injection treatment appeals to many because success, when it comes, is often dramatic. Either the water-soluble procaine hydrochloride or the oily solution "proctocaine" can be used. The effect of the latter is said to last longer, but this is disputed, and certainly complications following its use are seen in cases referred to the proctologist.

The injection is best made with the patient in the right lateral position (for the right-handed surgeon). The left index finger is inserted into the anal canal, and after cleaning the skin a subcuticular wheal is raised with procaine. The needle is then pushed forwards, first on one side of the anal canal and then on the other, and 5 ml. of proctocaine or procaine injected on each side in order to cause temporary

relaxation of the sphincter muscle; 1 or 2 ml. is finally injected into the base of the ulcer. The sphincters promptly relax and enable a second finger to enter the anal canal alongside the first. The muscles are then gently stretched.

Injections in this region are usually acutely painful, so that a failure is the more disappointing to the patient. Injections in such a contaminated area may cause abscess and fistula formation. If proctocaine be injected too superficially a necrotic ulcer will develop.

3. Digital Dilatation

The most popular method of treatment is digital dilatation of the anal canal. The patient is given a general anaesthetic, and the anal canal is gently stretched until two or more fingers can be inserted into it.

Again this simple method may produce a permanent immediate cure. But it is uncertain: an over-vigorous stretch has caused serious damage to the sphincter muscle; whilst one too gently performed is ineffective. Carefully done with local analgesia and combined with dietetic and habit adjustments, it can be recommended for the uncomplicated fissure.

4. Excision of Fissure

Radical cure of an anal fissure entails excision of the ulcer, with division of the subcutaneous sphincter muscle. The patient is anaesthetized and placed in the lithotomy position. The fissure is then excised. A triangular piece of skin is outlined, with the apex at the anus and base outwards and including the fissure ulcer. It is dissected upwards off the underlying tissue. The subcutaneous sphincter is divided in the centre of the wound, and the two ends retract to leave a wound approximately $1\frac{1}{2}$ in. (3.8 cm.) long and 1 in. (2.5 cm.) wide (Fig. 1).

Gabriel (1930, 1952) advises that this wound be left open and be permitted to heal by second intention. This entails a prolonged regime of some weeks before the wound is healed. The surgeon must be careful to keep the wound flat so that pockets will not form. In good hands the results of the operation are excellent, but if the surgeon be less vigilant the scar puckers to leave a tight anus, with the possibility of recurrence.

Suture of the wound cannot be recommended, because the danger of abscess and fistula formation is too great. Moreover, when the wound is sutured there is a possibility of the anus becoming constricted and again favouring recurrence.

The best treatment is to apply a split-skin (Thiersch) graft to the wound after excision (Hughes, 1952). After excision in the manner outlined above, a row of guy sutures are placed in position along either side of the wound (Fig. 2). A graft of split-thickness skin is taken from the leg or arm, applied to a mould of tulle gras and wool (Fig. 3), and then held firmly in the wound as the guy sutures are tied across the back of the mould (Fig. 4). A preliminary course of succinylsulphathiazole before the operation and antibiotic therapy post-operatively controls any tendency for contami-

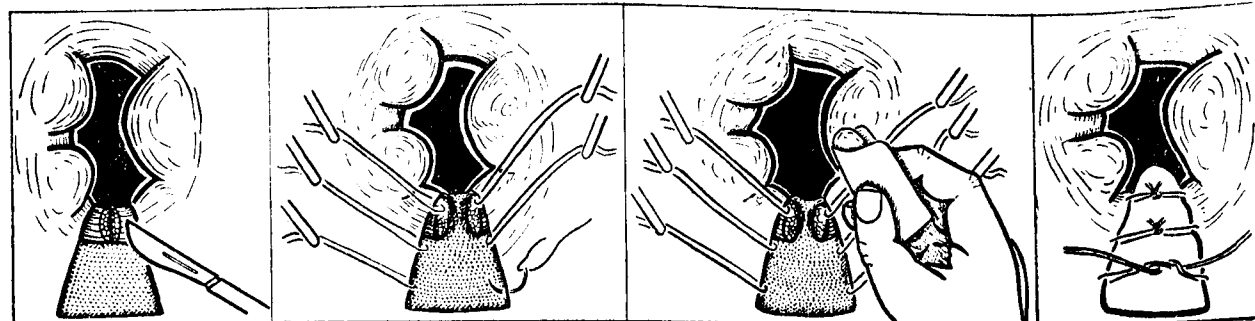


FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 1.—The subcutaneous portion of the external sphincter is divided. FIG. 2.—Guy sutures are inserted along the edges of the wound. FIG. 3.—A mould is made of tulle gras and wool; over the face of the mould is laid the split skin graft. The mould with graft is placed in the wound. FIG. 4.—The graft is secured by tying the guy sutures across the back of the mould.

nation to develop into infection. The antibiotic therapy consists of penicillin "distaqueine" fortified, 300,000 units, and streptomycin 0.5 g. both three times a day for four days. The graft is inspected on the fourth or fifth post-operative day and the mould removed. Any excess skin is removed and a piece of cotton-wool is placed over the grafted area to keep it dry. The patient is discharged on the fifth or sixth day post-operatively with the wound healed.

Goodsall (1892) practised sphincterotomy with good results. He did not excise the ulcer but simply cut through the subcutaneous sphincter. The wound healed by secondary intention. In patients with chronic fissures who are unwilling to undergo operation this process has more to commend it than digital dilatation.

Discussion

An anal fissure is a non-malignant condition of the anus, causing acute discomfort to the patient. He asks for relief, but is reluctant to accept a treatment that demands an absence from work for any prolonged period.

Acute uncomplicated fissures not uncommonly respond to more conservative measures. The patient is advised of the nature of his condition, suitable adjustment is made to his diet to give a bulky but soft stool, and digital dilatation is practised; an injection of local analgesia often helps to break the vicious circle by enabling the surgeon to dilate the anus gently.

Chronic fissures, particularly those complicated by some degree of infection of the deeper tissues, are unlikely to obtain permanent relief by such measures. If an anaesthetic is to be given to the patient, the fissure is best excised so that recurrence is prevented. If there are associated haemorrhoids, these should be removed. After excision of the fissure and division of the subcutaneous sphincter the wound can be left open to heal by secondary intention, but this prolongs the convalescence, demands daily dressings and keen appreciation by the surgeon of the importance of a flat wound until completely covered by epithelium, and still leaves a scar which as it matures might be responsible for recurrence of the fissure. Therefore I favour primary skin-grafting to the wound after the fissure has been excised (Hughes, 1952). The period in hospital and that of convalescence are much shortened, no dressings are required after the grafted area has been inspected, the absence of granulation tissue eliminates fibrosis, and the chances of recurrence of the fissure are slight. The results of primary skin-grafting have been excellent: all 12 cases subjected to excision of the anal fissure combined with primary skin-grafting have had a 100% "take" and all have left hospital within a week of the operation with the fissure removed and the wound healed.

Summary

The aetiology and pathological and clinical features of anal fissure have been briefly reviewed. The acute but otherwise uncomplicated fissure may respond to treatment administered in consulting-rooms, but chronic fissures, particularly those complicated by infection, superficial or deep, usually require more radical treatment. The fissure should be excised, the subcutaneous sphincter divided, and a primary split-thickness skin graft applied. The fissure is removed and the wound completely healed during a stay of six to seven days in hospital.

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INTESTINAL PROTOZOA IN MENTALLY DEFICIENT CHILDREN

BY

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Specimens of faeces from mentally deficient children in the wards of Harperbury Hospital, Shenley, Hertfordshire, were examined by various methods in order to ascertain the degree of infections by intestinal protozoa.

This paper gives particulars of the methods used and the results obtained in a "pilot" survey which was undertaken during September and October, 1952.

Materials and Methods

The total number of mentally deficient children currently treated at Harperbury Hospital was 56. Specimens of faeces for this survey were secured from 50. All those examined were male. Their age distribution and the duration of their stay in hospital were as follows:

Age	No. of Children	Time in Hospital	No. of Children
5 to 7 years	10	Less than 3 years	8
8 to 10 "	15	From 3 to 5.9 years	21
11 to 13 "	18	From 5 to 8.9 years	18
14 to 17 "	7	Over 9 years	3
Mean age of the group 10 years		Mean duration, 5.36 years	

The children came from the London and Middlesex areas, and none had resided in a tropical or subtropical country. There was some contact between them and outside because they attended school. Intestinal disturbances were not uncommon.

Specimens were placed in new clean waxed cream cartons and carried by messenger to the London School of Hygiene and Tropical Medicine. When received they were usually 3 to 5 hours old, but in a few instances they were from 10 to 12 hours old. Most of the specimens were formed. Each batch was inoculated at once in culture media, then examined directly and after concentration. Particulars of the techniques follow.

Direct Examination.—In addition to the direct films in saline and iodine (double strength Gram's iodine) a third film was made in a drop of 1% aqueous solution of eosin. This procedure (Kuenen and Swellengrebel, 1913), besides improving the efficiency of the direct examination (three films seen instead of the usual two), has some other advantages. The eosin solution has the property of staining everything in the stool pink, except living protozoa. On this pink background the living protozoa (and their cysts) stand out prominently as colourless, pearl-like, refractile bodies which can be recognized very easily even with the 2/3 objective. Moreover, the chromatoid bodies of the cysts of *Entamoeba histolytica* (invisible in the iodine preparation) are much more distinguishable in eosin films than in ordinary saline preparations. Each of the three films of the direct method was examined for about 10 minutes, first under the 2/3 objective and then under the 1/6 (with a $\times 10$ eyepiece).

Concentrated Specimens.—The original centrifugal flotation technique of Faust *et al.* (1939) was modified in order to facilitate detection of cysts of the smaller intestinal protozoa. Tests were made with denser solutions of zinc sul-

phate, the specific gravity of which was increased by steps of 0.02. Finally it was found that the specific gravity of the zinc sulphate solution could be increased from 1.18 to an optimum of 1.28, which corresponds to a 51% solution. This new centrifugal flotation technique can be summarized as follows:

1. Take a piece of faeces the size of a walnut and emulsify it in tap-water, using a pestle and mortar to ensure a uniform suspension.
 2. Strain off large particles by pouring the solution through a copper wire sieve of about 40 mesh to the inch into a bowl (wet the sieve before use).
 3. Centrifuge the emulsion at about 3,000 revolutions a minute for about three minutes to obtain a deposit.
 4. Pour off supernatant fluid and break up deposit with a glass rod.
 5. Half fill the tube with 51% zinc sulphate, stir with the glass rod and complete suspension by gently inverting the tube after closing the mouth with the thumb or cork. Try to avoid the formation of bubbles, as these will interfere with the final "film."
 6. Fill the tube nearly to the brim with the zinc sulphate solution and mix again by gently inverting the tube several times as before.
 7. Centrifuge at about 3,000 revolutions for three minutes and allow the tubes to come to rest gradually without disturbance.
 8. Remove a portion of the film on the top of the fluid by a loop bent to lie in a horizontal position and deposit a loopful on each of two slides.
 9. Add a little 1% eosin to one and Lugol's iodine to the other, mix in and cover with a coverslip.
- N.B.*—Do not delay the dilution in eosin and iodine after the cysts have been exposed to zinc sulphate, as they tend to collapse after about 15 minutes in this strong solution.

TABLE I.—Protozoa found in Faecal Specimens from Mentally Deficient Children

No.	Age in Years	Time in Hospital	Results			
			In Direct Film	Additional Findings		Total Findings
				After Concentration	After Cultivation	
1	8	3-3 years	Neg.	Neg.	Neg.	Neg.
2	14	8-6 "	E.c.	Neg.	E.h. Ent.h.	E.c. E.h. Ent.h.
3	7	5-0 "	I.b. E.n.?	E.n. E.c.	Ent.h.	I.b. E.n. E.c. Ent.h.
4	11	5-7 "	Neg.	Neg.	Ent.h.	Ent.h.
5	15	6-3 "	Neg.	Neg.	Neg.	Neg.
6	9	2 days	Neg.	Neg.	Neg.	Neg.
7	7	4-0 years	E.h. G.i. E.n. E.c.	I.b.	—	E.h. G.i. E.n. E.c. I.b.
8	5	45 days	E.c. E.h. Small cyst?	I.b.	—	E.c. E.h. I.b.
9	12	8-1 years	Neg.	Neg.	Neg.	Neg.
10	7	1-4 "	E.c.?	E.c.	—	E.c.
11	12	8-3 "	Neg.	Neg.	—	Neg.
12	13	8-3 "	E.h.?	E.h. I.b. E.c. C.m.	Neg.	E.h. I.b. E.c. C.m.
13	16	13-8 "	I.b.	E.c. E.h.	—	I.b. E.c. E.h.
14	6	3-3 "	E.c.	E.c.	—	E.n. E.c.
15	6	3-3 "	Neg.	Neg.	Neg.	Neg.
16	7	2-3 "	E.c.	Not made	—	E.c.
17	11	3-8 "	Neg.	Neg.	Neg.	Neg.
18	13	8-4 "	Neg.	Neg.	Neg.	Neg.
19	12	7-7 "	G.i. E.c.	—	—	G.i. E.c.
20	9	8-2 "	Neg.	Neg.	Neg.	Neg.
21	8	6-1 "	Neg.	Neg.	Neg.	Neg.
22	9	3-4 "	G.i.	—	—	G.i.
23	12	7-8 "	G.i.	E.c. I.b.	Ent.h.	G.i. E.c. I.b. Ent.h.
24	17	13-8 "	Neg.	E.c.	—	E.c.
25	13	8-4 "	E.h. E.c.	—	—	E.h. E.c.
26	8	2-9 "	Neg.	Neg.	Neg.	Neg.
27	13	6-3 "	Neg.	Neg.	Neg.	Neg.
28	8	3-3 "	E.h. I.b.	E.c. C.m.	—	E.h. I.b. E.c. C.m.
29	9	6 months	Neg.	Neg.	Ent.h.	Ent.h.
30	12	7-9 years	Neg.	Neg.	Neg.	Neg.
31	10	7-8 "	E.c. G.i.	E.h.	—	E.c. G.i. E.h.
32	13	3-2 "	E.c.	—	Ent.h.	E.c. Ent.h.
33	8	3-3 "	E.n.	—	E.h.	E.n. E.h. G.i.*
34	13	4-3 "	E.c.	—	—	E.c.
35	7	3-1 "	Neg.	Neg.	Neg.	Neg.
36	5	11 months	E.h.	—	Ent.h.	E.h. Ent.h.
37	14	5-4 years	E.n. E.c.	—	—	E.n. E.c.
38	11	4-9 "	E.c.	—	Ent.h.	E.c. Ent.h.
39	12	5-9 "	Neg.	Neg.	Neg.	Neg.
40	10	4-6 "	E.n. E.h.	—	—	E.n. E.h.
41	8	5-7 "	E.c.	E.h.	—	E.c. E.h.
42	8	1-2 "	E.c.	E.n.	E.h.	E.c. E.n. E.h.
43	13	7-5 "	E.c. Small cyst?	E.n.	—	E.c. E.n.
44	8	4-8 "	E.h. Small cyst?	I.b. E.c.	—	E.h. I.b. E.c.
45	10	6-5 "	E.c. E.h.	I.b.	Ent.h.	E.c. E.h. I.b. Ent.h.
46	12	5-1 "	E.c.	C.m.	—	E.c. E.n.* C.m.
47	14	6-5 "	E.c.	—	—	E.c.
48	11	9-0 "	E.h.	E.c.	—	E.h. E.c.
49	14	6-7 "	E.c.	—	Ent.h.	E.c. Ent.h.
50	6	3-5 "	G.i. E.c.	E.m.	—	G.i. E.c. E.n.

* Revealed by Heidenhain's haematoxylin staining of a wet-fixed film.
E.c. = *Entamoeba coli*. E.h. = *E. histolytica*. E.n. = *Endolimax nana*. I.b. = *Iodamoeba butschlii*. G.i. = *Giardia intestinalis*. C.m. = *Chilomastix mesnili*. Ent.h. = *Enteromonas hominis*.

Each of the two slides of the concentrated specimen was examined for 10 minutes, bringing the total time devoted to the examination of every specimen, either positive or negative to approximately 50 minutes. A certain number of faecal specimens were examined more than once by the above methods.

Cultivation.—As soon as the specimens were received they were inoculated in culture media—Dobell's HSre medium, or modified Tanabe's medium for intestinal flagellates, or Rao's (1951) modified liver infusion agar medium. A loopful of sterile rice starch was added to the culture tubes upon inoculation, and the whole work was performed under sterile conditions. Cultures were examined after 24 hours at 37° C., and in some instances after 48 hours. Sub-inoculations and isolation of colonies of protozoa were made only in exceptional cases.

Permanently Stained Preparations.—These were made in a few selected cases. The staining methods used were Heidenhain's iron haematoxylin and Mallory's phosphotungstic haematoxylin, as modified by one of us (W. C.) (see Hoare, 1949). Dry preparations were made of some flagellates from cultures, and these were stained by Leishman's and/or Giemsa's method.

Results of Direct Film and Concentration

Table I gives detailed results of the general one-stool examination in direct film and after concentration, cultivation, and staining of permanent preparations. Cysts of four species of amoebae and two species of flagellates were detected during this survey. No active forms either of amoebae or of flagellates were found. Of the 50 specimens

examined, 30 were positive for one or more species of protozoa in the direct film (60%). After concentration the number of positive specimens increased to 33 out of the 49 examined (67%). In no case did the direct examination reveal anything that the examination of the concentrated specimen did not, and often the latter technique changed a doubtful into a certain result.

Table I shows the following incidences: *E. coli*, 29 (58%); *E. histolytica*, 16 (31%); *E. nana*, 10 (20%); *I. butschlii*, 9 (18%); *G. intestinalis*, 7 (14%); *C. mesnili*, 3 (6%); *Ent. hominis*, 10 (20%).

The importance of the concentration technique is shown even more by the increased number of species of protozoa detected (Table II).

TABLE II

No. of Specimens Positive for	Direct Film	Concentration
1 species of protozoa ..	21	11
2 " " " " " "	10	10
3 " " " " " "	0	9
4 " " " " " "	1	2
5 " " " " " "	0	1
Average No. of species of protozoa per positive specimen ..	1.4	2.2

The relative efficiency of direct film examination, as compared with concentration, is given in Table III. (The figures in parentheses represent percentages of the first column when the figures of the third are taken as 100%.)

TABLE III.—Number of Specimens in which Cysts were Detected

	Direct Film	Concentration
<i>E. coli</i> ..	18 (64%)	28
<i>E. histolytica</i> ..	9 (60%)	15
<i>E. nana</i> ..	5 (50%)	10
<i>I. butschlii</i> ..	3 (33%)	9
<i>G. intestinalis</i> ..	6 (100%)	6
<i>C. mesnili</i> ..	0 (0)	3

Cultivation

(a) No. 33 (Table I) showed trophozoites of *E. histolytica* (not found before).

(b) Nos. 3, 4, 23, 29, 32, 36, 38, 45, and 49 showed active forms of small flagellates which could not be identified with certainty. In order to identify them in at least one instance, a culture of No. 2 in Dobell's HSre medium, showing small flagellates, was subinoculated in the same medium, and for some time, until the organisms were numerous enough to enable us to make permanent preparations. They were also examined under dark-ground illumination, and were eventually diagnosed as *Enteromonas hominis*.

(c) Nos. 2 and 42 showed, in addition to the "small" flagellates mentioned above, trophozoites of *E. histolytica*. No. 42 had been negative previously for this organism. It should be noted that Nos. 4 and 29, which were found negative when examined by other techniques, proved positive after cultivation, thus increasing the overall incidence of protozoa found during this survey to 70% of the specimens, and the proportion of specimens showing *E. histolytica* was raised by these cultural methods to 34%. *Blastocystis hominis* was a very common contaminant of the cultures.

Permanent Preparations

Permanently stained preparations were made of about one-fifth of the specimens obtained, using one or more of the staining methods mentioned. Only when examination was prolonged for over 30 minutes (under the 1/12 objective) was it possible to detect species of protozoa not found previously. Thus *G. intestinalis* cysts and *E. nana* cysts were added to the previous results of Nos. 33 and 46 respectively. The size of the *E. histolytica* cysts was not measured as a routine, but most seemed to be of the small variety (7 μ to 12 μ).

Discussion

This small survey did not pretend to find out the true incidence of infection of intestinal protozoa, which would have required the examination of repeated specimens. However, specimens from twelve children were examined twice, from two children three times, and from a further two children four times; three additional infections of *E. histolytica* were thereby discovered, bringing the apparent total incidence of this species to 40%. This figure is probably the highest recorded in the United Kingdom, where in persons who had never resided abroad it has varied from 1.6% (Morton *et al.*, cited by Hoare, 1950) to 10% (Dobell *et al.*, cited by Hoare, 1950). In a group of men of the R.A.F. previously stationed in India, some of whom had given a past history of dysentery, Rickards (1949) estimated a true incidence of from 21.99 to 36.65% (*E. histolytica*). High rates are usual in institutions for mental deficient, and even higher rates than the present ones were found by Tobie *et al.* (1951) in Wassaic State School, Wassaic, New York, U.S.A., where the following incidence (direct film and concentration combined) was determined: *E. coli*, 76%; *E. histolytica*, 59%; *E. nana*, 65%; *I. butschlii*, 61%; *G. intestinalis*, 38%; *C. mesnili*, 40%.

The importance of *E. histolytica* with respect to public health remains doubtful in the absence of clear knowledge of the pathogenicity of the species. It is suggested that the high incidence of this parasite (and others) in patients in mental institutions, as compared with that in the general population, is probably due to close contact between people with unhygienic personal habits.

Conclusions and Summary

A pilot survey for intestinal protozoa was carried out with faecal specimens from mentally deficient children in Harperbury Hospital, Shenley, Hertfordshire, during which, besides direct examination and cultivation, a new concentration technique was used.

The results of this survey showed a very high infection rate among these children, most of whom were found to harbour from one to as many as five different species of intestinal protozoa. The rate of infection with *E. histolytica* was found to be 40%, but it is believed that its incidence may be even higher.

A rare species of flagellate, *Enteromonas hominis*, was isolated in culture media from one specimen and maintained by subinoculation in Dobell's medium.

This work was done under the guidance and direction of Professor P. C. C. Garnham, Director of the Department of Protozoology, to whom we are indebted for the facilities provided for this investigation. We are also indebted to Dr. E. D. Taylor, medical superintendent, Harperbury Hospital, for the supply of specimens of faeces and epidemiological information on the mentally deficient children of his hospital.

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At the end of March this year there were 9,413 blind persons on the registers of the local authorities in Scotland, the highest figure ever recorded. The increase over last year of 294 people is accounted for almost entirely in the 70-years-and-over age group, which now comprises 44% of the total. The total number of children under 16 registered as blind was 184, 27 of whom were new registrations.

HYPERCALCAEMIA AND IMPAIRMENT OF RENAL FUNCTION IN GENERALIZED SARCOIDOSIS

BY

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Patients with generalized sarcoidosis occasionally show evidence of impaired renal function. In most of the cases reported in the literature this has been associated with marked hypercalcaemia (van Creveld, 1941; Schüpbach and Wernly, 1943; Klinefelter and Salley, 1946; Westra and Visser, 1949; Longcope and Freiman, 1952). The pathological mechanisms underlying these disturbances remain obscure, and we have recently had an opportunity of studying a case with these two complications and of observing the effect on them of cortisone therapy.

Case Report

A married man aged 23 was first seen in July, 1950. He complained of vague dyspepsia, which he had had for three months, and also admitted to the loss of 16 lb. (7.3 kg.) in weight and to nocturia up to four times a night. The only abnormality noted on physical examination was a moderately enlarged gland in the right axilla. The chest x-ray film showed bilateral hilar gland enlargement and miliary mottling in the lung fields. He was admitted to hospital and various investigations were carried out. No tubercle bacilli were found in the sputum, urine, or gastric contents. The Mantoux test was negative at 1/100. The urine contained a few pus cells and hyaline casts, the concentration-dilution range was 1010 to 1006, and the maximum urea concentration was 1.49 g. per 100 ml. The blood urea was 60 mg. per 100 ml, and the urea clearance (C_m) 65% of average, normal. An intravenous pyelogram showed no abnormality. The plasma albumin was 3.8 g. per 100 ml., globulin 2.5 g. per 100 ml.; the serum flocculation tests were positive; and the E.S.R. was 58 mm. in one hour (200 mm.). A diagnosis of pulmonary sarcoidosis was made and the patient was discharged to out-patient supervision.

In June, 1951, he started to get attacks of pain in his right loin; these became increasingly severe, and from April, 1952, were accompanied by haematuria. He was readmitted to hospital for further study. Physical examination revealed a few enlarged glands in the right axilla, and there was early calcification of the corneal limbus of both eyes. The chest x-ray film still showed enlarged hilar glands and further mottling of the lung fields. A straight x-ray film of the abdomen showed a "mulberry calculus" in the right renal area; x-ray films of the skeleton were normal. The urine contained numerous pus and red blood cells, and was sterile on culture; the concentration-dilution range was 1010 to 1008, and the maximum urea concentration 1.4 g. per 100 ml. The blood urea was 60 mg. per 100 ml. and the urea clearance (C_m) 47%. The E.S.R. was 46 mm. in one hour (100 mm.). The plasma albumin was 3.5 g. and the globulin 4.6 g. per 100 ml.; the electrophoretic pattern showed an increase of γ -globulin. The serum calcium was 14.3 mg. per 100 ml., plasma inorganic phosphorus 4.2 mg. per 100 ml., and serum alkaline phosphatase 11.1 (K.-A.) units per 100 ml. The urinary calcium output was 350 mg. in 24 hours on an ordinary ward diet containing about 1 g. of calcium. Estimations of serum and C.S.F. calcium were performed on specimens obtained nearly simultaneously; the

serum contained 13.8 mg. and the C.S.F. 5.1 mg. per 100 ml. The Mantoux test was negative at 1/100. Biopsy of a gland in the right axilla showed the typical appearance of sarcoidosis.

It was decided to study the effect of cortisone on the radiological appearance of the lung fields and on the calcium metabolism and serum proteins. In view of the relationship between sarcoidosis and tuberculosis and of the danger of activating tuberculous lesions with cortisone, it was also decided to give streptomycin during this period. Preliminary determinations of the blood streptomycin levels after various doses were made in view of the impaired renal function. The dose chosen was 1 g. of streptomycin a day. This was started on May 10 and continued until July 13, periodic blood-level determinations being made during this time. After a preliminary nine-day period on a low-calcium diet (170 mg. a day) cortisone, 150 mg. daily in six-hourly doses by mouth, was started on May 11. During the preliminary period on the low-calcium diet the serum and

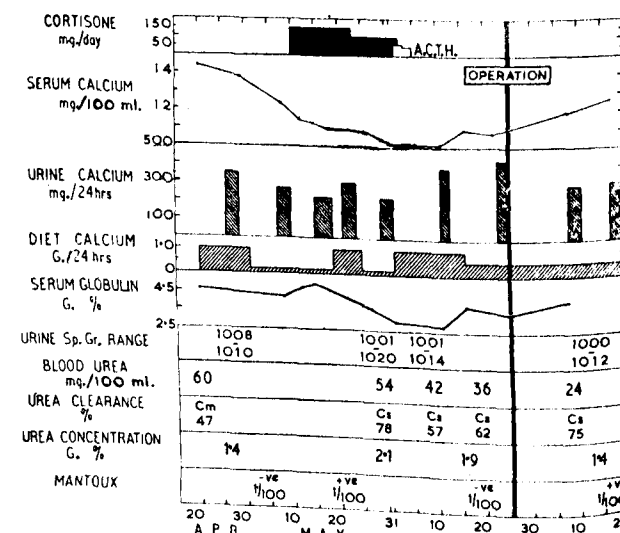


Chart of the case, showing effect of cortisone therapy and variation of dietary calcium on serum and urinary calcium, serum globulin, and renal function.

urinary calcium fell. Reduction of the serum level continued while the patient was on cortisone, despite an increase of the dietary calcium after 10 days. The lowest figure obtained was 10.1 mg. per 100 ml. The urine calcium also fell further when the patient was first given cortisone with a low-calcium diet, but there was a slight temporary increase when the calcium intake was raised. The plasma inorganic phosphorus fell to 2.2 mg. per 100 ml. The alkaline phosphatase was unchanged. There was some reduction of the serum globulin, an improvement in renal function, and the Mantoux test became positive (Pyke and Scadding, 1952). (These changes are shown in the Chart.) The sedimentation rate showed no significant change. The course of cortisone was continued for 23 days and all diets given during this period had a low-sodium content.

X-ray examinations of the chest during the treatment showed steady improvement, and by the end of the course there had been marked clearing, which has persisted (August, 1952).

Surgical opinion advised exploration of the kidney and removal of the stone, and this was done on June 26 by Mr. D. R. Davies. The stone was found to be almost pure calcium oxalate. A renal biopsy performed during the operation showed evidence of very mild chronic pyelonephritis but no characteristic sarcoid lesions or evidence of calcification.

The patient's recovery from operation was uneventful, but subsequently he started to get pain in the left side; the serum calcium level had risen to 12.6 mg. per 100 ml. before

his discharge from hospital and his urinary calcium output remained over 300 mg. per 24 hours despite moderate restriction of the calcium intake.

Discussion

This patient had "band keratitis" and a renal calculus, clinical manifestations of hypercalcaemia and of hypercalciuria respectively. Calculi, almost always of calcium oxalate, have occasionally been reported in patients with generalized sarcoidosis (van Creveld, 1951; Albright and Reifstein, 1948; Longcope and Freiman, 1952), and corneal calcification is apparently equally rare (Haldimann, 1941; Cogan *et al.*, 1948). The origin of hypercalcaemia has not been satisfactorily explained, although three suggestions have been put forward: that it is due to the disturbance of plasma protein; that it is a manifestation of parathyroid overactivity; or that it results from bone destruction by sarcoid deposits. It is unlikely that the extra calcium is bound to the additional globulin, because the serum calcium and globulin levels (as determined by the present crude methods) do not vary in parallel (Harrell and Fisher, 1939; van Creveld, 1941; Albright and Reifstein, 1948). Under normal circumstances albumin and not globulin is the protein chiefly concerned in calcium binding (Gutman and Gutman, 1937), and if the extra calcium were all bound to protein hypercalciuria should not occur. Parathyroid hyperplasia has been found in some cases of sarcoidosis with hypercalcaemia (Westra and Visser, 1949; Longcope and Freiman, 1952), but in others exploration has shown the glands to be normal (Albright and Reifstein, 1948; the patient reported with a low plasma inorganic phosphorus level, and this also makes it unlikely that there is primary parathyroid overactivity.

The most probable explanation of the hypercalcaemia is that it is due to active destruction of bone from widespread involvement by sarcoid deposits. This would be comparable to that found in some cases of myelomatosis. Radiological changes in the bones in sarcoidosis are usually confined to the hands, and generalized bone rarefaction is rare, although van Creveld (1941) and Schüpbach and Wernly (1943) have reported cases in which it was present. Radiological evidence of generalized rarefaction is found only when there has been a negative calcium balance for many years, and sarcoidosis is a self-limited process in which hypercalcaemia has seldom persisted for any considerable evidence of rarefaction in most cases does not therefore exclude active bone destruction as the cause of the hypercalcaemia. More direct evidence is provided by the histological studies of Schaumann (1926), who demonstrated widespread osseous lesions and thinning of the bony trabeculae without any radiological changes.

The effect of variation of calcium intake on the serum calcium concentration and urinary output has seldom been reported. Albright and Reifstein (1948) found little change in the urinary calcium with intakes varying from 360 to 2,967 mg. a day. In our patient the serum level and urinary output of calcium fell slightly when he was placed on a diet containing much less calcium (170 mg. a day), although the urinary output remained abnormally large. Klinefelter and Salley (1946) also reported a slight fall in serum and urinary calcium on a low-calcium diet. The fact that the urinary calcium remained fairly high when the intake was only 170 mg., together with the histological evidence of Schaumann, suggests that the hypercalcaemia results from reduction of serum and urinary calcium following cortisone therapy would be consistent with this hypothesis. There was radiological evidence of improvement in the lung condition while cortisone was being given, and it is probable that the bone lesions, if any, were similarly affected.

Impairment of renal function is a rare finding in cases of sarcoidosis; in only two has a post-mortem examination been reported, and little is known about its causation. It

cannot be correlated with the severity of the sarcoid process in the kidney, but seems to have some association with hypercalcaemia. Longcope and Freiman (1952) reported a case in which the patient died of renal failure and the kidneys showed chronic pyelonephritis and tubular calcification. In another patient, dying of miliary tuberculosis, sarcoid lesions, miliary tubercles, and calcified tubules were found in the kidneys (Horton *et al.*, 1939). Our studies clearly indicate the reversibility of the renal function impairment and its lack of association with any permanent structural damage to the kidney. Reversible impairment of renal function is known to result from a number of biochemical disturbances, of which hypercalcaemia is one. Long-continued elevation of the serum calcium leads to permanent renal damage with tubular calcification and hyalinization of the glomeruli; transient hypercalcaemia, on the other hand, leads to a temporary impairment. The improvement in renal function in the patient reported here was more rapid than is usual, for example, after vitamin-D overdosage. The renal biopsy performed a few weeks after the serum calcium fell to normal showed no evidence of calcification, but, in view of the report by Björnboe and others (1952) of the disappearance of tubular calcification within three weeks of discontinuing treatment in a case of vitamin-D intoxication, this does not exclude the presence of tubular calcification before the cortisone administration, and there is always the possibility that the renal biopsy may not have been typical of the whole kidney.

Hypercalcaemia in sarcoidosis is of importance for three reasons. First, it may lead to impairment of renal function, which, however, rarely progresses to uraemia; secondly, calcium oxalate stones may form in the renal pelvis; and, thirdly, if it occurs in the absence of x-ray changes in the lungs or of hyperglobulinaemia it may be attributed to hyperparathyroidism and lead to an unnecessary neck exploration. Renal calculi and band keratitis with hypercalcaemia, hypercalciuria even on a low calcium intake, normal bone x-ray films, and a normal serum phosphatase may be found in "hyperparathyroidism without bone disease." In this condition the plasma inorganic phosphorus is usually reduced, but it may be normal if there is impairment of renal function—that is, in Albright and Reifstein's (1948) "hyperparathyroidism - without bone disease - with renal failure." The differential diagnosis can therefore be very difficult. Howard *et al.* (1949) have reported that in sarcoid with hypercalcaemia the C.S.F. calcium is elevated, whereas in hyperparathyroidism it is normal. The C.S.F. calcium estimations in our patient were performed in duplicate in two laboratories and do not support this claim, but our studies do suggest the possible value of cortisone in differentiating between the two conditions, though we have not yet had an opportunity of investigating the effect of this hormone on the serum calcium level in a case of hyperparathyroidism. A similar reduction in serum calcium concentration in a case of sarcoidosis treated with cortisone has been observed by Professor G. M. Bull (personal communication).

Summary

Hypercalcaemia and impairment of renal function may occur in generalized sarcoidosis. A case is described in which the effects of variation of dietary calcium and cortisone therapy were studied. Clinical, radiological, and biochemical improvement followed the administration of cortisone. There was reduction of serum calcium and serum globulin, and renal function was much improved.

It is suggested that hypercalcaemia and hypercalciuria result from active bone destruction due to generalized sarcoidosis, and that in some cases the impairment of renal function is a consequence of the continuing disturbance of calcium metabolism.

A renal biopsy performed after cortisone therapy showed no sarcoid deposits or tubular calcification.

The differentiation of sarcoidosis with hypercalcaemia from hyperparathyroidism is discussed.

We wish to thank Miss D. P. Tuck for the preparation of the special diets; Mr. V. K. Asta for the chart; and the Medical Research Council for the cortisone used in this study.

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ADDENDUM.—Since this report was prepared we have had another opportunity of studying the patient under constant normal dietary intake of calcium with and without cortisone. This time no change in serum proteins was observed, but again the cortisone reduced the serum calcium level to normal, improved renal function, and greatly improved the patient's well-being. This has now been repeated on three other patients with similar results. It appears that the improvement can be maintained for some months at least on a reduced dose of cortisone. It is hoped to publish these results later when a longer follow-up has been obtained. A recent paper by Shulman, Schoenrich, and Harvey (*Bull. Johns Hopk. Hosp.*, 1952, 91, 371) on the general effects of cortisone on patients with sarcoidosis briefly mentions changes in calcium levels and in renal function which are very similar to those we have described above.

SPLENIC VENOGRAPHY

BY

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Great interest has lately been taken in the surgical treatment of cirrhosis of the liver (Berman *et al.*, 1951; Reinhoff, 1951; Leger *et al.*, 1952; Hunt, 1952) and portal hypertension (Whipple, 1945; Blakemore and Lord, 1945; Blakemore, 1951; Walker, 1952; Hunt, 1952). Valuable information may be obtained by needle biopsy of the liver in cases of hepatic cirrhosis. The procedure is sometimes difficult owing to the hardness and smallness of the liver and to the presence of ascites. Portal hypertension is usually determined by noting the pressure in one of the tributaries of the portal vein. Cavernomatous changes in the portal vein and obstruction in its prehepatic part or in the splenic vein may be made out by injecting a radio-opaque dye in the tributaries. In all these cases the abdomen has to be opened to carry out the investigation. Moreover, a surgeon must be sure that the splenic vein is patent and that the veins are large enough before attempting spleno-renal anastomosis. If useful information could be obtained

without laparotomy by a procedure which is safe it would be welcome. Splenic venography was done by Dreyer and Budtz-Olsen (1952) in 11 cases without any untoward incident. They suggested, among other things, that the method might be useful in finding out the site of block in cases of portal hypertension.

We carried out splenic venography in two control cases, in two with portal hypertension, in three cases with cirrhosis of the liver, and in seven cases of splenomegaly of unknown aetiology.

Method

The patients fasted overnight. Half an hour before the procedure 50 mg. of pethidine hydrochloride was injected. The patients lay supine on the x-ray table. The left ninth intercostal space in the mid-axillary line was chosen as the

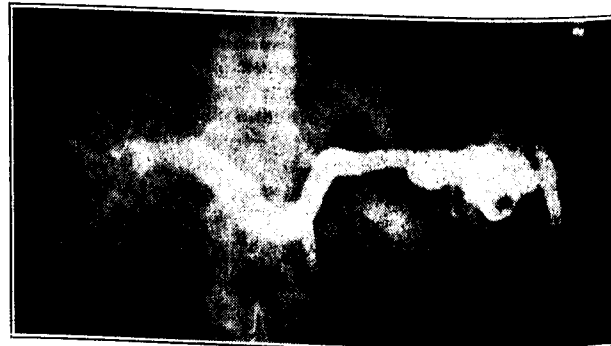


FIG. 1.—Splenic venogram showing iodoxyl in spleen, splenic vein, upper part of a superior mesenteric vein, portal vein, and intrahepatic branches of portal vein.

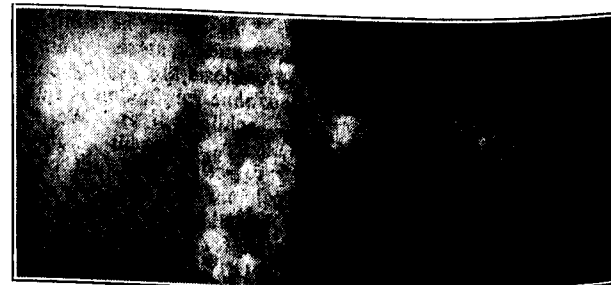


FIG. 2.—Most of the dye has left the spleen and accumulated in the right lobe of the liver.

site for injection of the radio-opaque dye. The part was sterilized and the space up to the splenic capsule was anaesthetized with 2% procaine hydrochloride solution. About 5 ml. was needed. Then 20 ml. of a solution of "iodoxyl" (N-methyl-3:5-di-iodo-4-pyridone-2:6-dicarboxylic acid) was taken into a 20-ml. Record syringe to which a lumbar puncture needle was attached. It was pushed in medially and slightly downwards. The engagement of the needle in the spleen could be felt. The patients were asked to hold their breath at the end of inspiration until the whole amount was injected. An assistant held the lower pole of the spleen in cases in which it was enlarged.

The dye was injected as quickly as possible and a picture was taken when 15 ml. of dye had been injected (Fig. 1). That amount took about five seconds to inject. The next picture was taken five seconds later, when the full amount of the dye had been injected (Fig. 2). The needle was taken out and the site was sealed. At first we used a fine lumbar-puncture needle (children's size) attached to a 20-ml. all-glass syringe. It required great force to inject the dye into the splenic pulp. Later on, an adult lumbar-puncture needle attached to a Record syringe was used, when it became easy to inject the dye in five seconds. If the spleen was enlarged the needle was pushed for about 5 cm. from the skin surface. In cases without splenic enlargement this

distance varied between 3 and 4 cm., depending on the thickness of the parietes. The patients were kept in bed for 24 hours and the pulse, respiration, and temperature were noted every hour. Sensitivity to iodine was not tested.

Reactions

If we exclude the first patient, who neither fasted nor had a sedative before the injection of the dye, there were practically no untoward reactions. Most of the patients complained of some pain over the spleen which lasted for about 10 minutes. There was no obvious alteration in pulse, respiration, and temperature. To note the amount of bleeding we drew out ascitic fluid in two cases of cirrhosis of liver before and after venography. In both cases only the second specimen contained blood. The patients were up and about from the next day and took their usual diet. The first patient vomited immediately after the injection of the dye, had a rigor, and was febrile for several days. He is now quite well. The cases are summarized in the Table.

Discussion

In a normal splenic venogram the splenic vein and the portal vein and its branches for some distance inside the liver are visible. A small portion of the superior mesenteric vein near its entry into the splenic vein may sometimes be made out (Fig. 1). The dye leaves the spleen very rapidly (Fig. 2). A small remnant may, however, be seen inside the spleen even an hour after the investigation. It usually appears in the urinary bladder within 30 minutes of the injection of the dye. In cases of obstruction of the splenic vein the portion of the vein beyond the obstruction will not appear, as shown by Dreyer and Budtz-Olsen (1952). In portal hypertension due to greatly increased pressure in the portal circulation the blood flow may be reversed and the dye may enter the inferior mesenteric vein, its tributaries, and the left gastric vein (Fig. 3).

In cirrhosis of the liver, as the obstruction to the portal vein is inside the liver, the intrahepatic branches of the vein

are either not made out or faintly seen, depending on the degree of obstruction, and the extrahepatic portal vein and the splenic vein become markedly dilated and tortuous (Fig. 4). The inferior mesenteric and left gastric veins may not be demonstrated unless the portal hypertension is great. Hence the degree of prominence and tortuosity of these veins in the splenic venogram will be a measure of the extent of portal hypertension. Case 5, who was admitted to hospital for operative treatment of cirrhosis of the liver, had a contracted liver with a granular surface. The portal pressure was 300 mm. of saline, and immediately after ligation of the hepatic and splenic arteries it fell to 225 mm. There was no injury to the spleen due to venography.

In our cases of splenomegaly of unknown aetiology there was no clinical evidence of portal hypertension, the liver-function tests were within normal limits, and liver biopsy did not show cirrhotic changes. Owing to the huge splenic enlargement the splenic vein has to carry a large amount of blood and becomes dilated and tortuous. The portal vein and its intrahepatic branches also become dilated. In these cases the dye will be poorly concentrated, and the venogram will show dilatation and tortuosity of the splenic and portal



FIG. 3.—Tortuous splenic and inferior mesenteric veins. Extrahepatic portion of portal vein and left gastric vein can be seen.

Summary of Cases

Case No.	Age and Sex	History of Bleeding	Veins over Abdominal Wall	Venous hum.	Spleen	Liver	Ascites	Liver-function Tests	Liver Biopsy	Clinical Diagnosis	Splenic Venogram
1	24 M	—	—	—	N.P.	N.P.	—	Normal	Not done	Neurosis	Showed splenic vein, part of superior mesenteric vein, and portal vein with its intrahepatic branches (Fig. 1)
2	20 M	—	—	—	1 F.	1 F.	—	"	" "	Tuberculous cervical lymphadenitis with chronic malaria	Same as above. Superior mesenteric vein not shown
3	12 M	Haematemesis	+	+	3 F.	2 F.	—	"	Slight fatty changes in peripheral part of lobules	Splenomegaly with portal hypertension	Tortuous splenic vein, prominent and tortuous inf. mesenteric vein extending up to pelvis with its tributaries, left gastric vein, and portal vein before its entry into liver (Fig. 3)
4	26 M	Haematemesis and melaena	+++	++	4 F.	—	—	Abnormal	Not done	" "	Dilated and tortuous splenic and portal veins. Inf. mesenteric vein shown faintly
5	50 M	—	+	—	2 F.	—	+++	"	Marked cirrhotic changes	Portal cirrhosis	Very dilated splenic and portal veins. Intrahepatic branches of portal vein not shown (Fig. 4)
6	24 M	Haematemesis	+	—	2 F.	—	+++	"	Not done	" "	" "
7	35 M	—	+	—	3 F.	1 F.	++	Within normal limits	Slight fatty changes	" "	Marked dilatation and tortuosity of splenic and portal veins. Intrahepatic branches faintly shown (Fig. 5)
8	42 M	—	—	—	Symphysis pubis	3 F.	—	"	"	" "	" "
9	25 M	—	—	—	Left iliac fossa	3 F.	—	"	Focal areas of early fibrosis	" "	" "
10	35 F	—	—	—	2 F. below umbilicus	2 F.	—	"	Slight fatty changes	" "	" "
11	26 M	—	—	—	4 F.	2 F.	—	"	Not done	" "	" "
12	22 M	—	—	—	Umbilicus	2 F.	—	"	"	" "	" "
13	23 M	—	—	—	Left iliac fossa	3 F.	—	"	"	" "	" "
14	22 M	—	—	—	Umbilicus	3 F.	—	"	No abnormality	" "	Very faintly outlined splenic and portal veins

— Absent. + Slight. ++ Moderate. +++ Marked. N.P. Not palpable. F. Finger below costal arch.

veins (Fig. 5). As there are no cirrhotic changes, the intrahepatic branches of the portal vein can be made out, though faintly owing to dilution of the dye. Inferior mesenteric and gastric veins are not seen, as there is no associated portal hypertension. In Case 14, who underwent splenectomy, the portal venous pressure was 120 mm. of saline. Often some of the dye gets underneath the capsule of the spleen, probably owing to adhesions between the spleen and the parietal wall; but in the case of splenomegaly in which splenectomy was done no such adhesions were found. In this case also no injury was noted in the spleen due to venography.

In experienced hands splenic venography is usually safe. Rarely the dye may produce vomiting and rigor, as is sometimes seen when carrying out intravenous pyelography.



FIG. 4.—Markedly dilated splenic vein. Extrahepatic portion of portal vein faintly seen, but the intrahepatic branches are not visible.



FIG. 5.—Tortuous and dilated splenic and portal veins. The intrahepatic branches are dilated and the dye is poorly concentrated in them.

Overnight fasting and the use of pethidine hydrochloride usually prevent these complications. Though pethidine quiets the patient and removes his apprehensiveness, he remains co-operative and holds his breath during injection of the dye. There is some bleeding due to puncture of the spleen, which, however, stops spontaneously. The needle should be pushed for some distance inside the spleen and the dye injected into the splenic pulp. There is far less chance of rupture of the spleen than when the dye is forcibly pushed immediately underneath the capsule. The possibility of excessive bleeding and of rupture of the spleen, though very remote, should be kept in mind, and the procedure carried out only in a hospital where emergency splenectomy could be done.

Most of the patients complained of pain over the spleen immediately after injection of the dye. It lasted from five to ten minutes. It is probably due to spasmodic contraction of the spleen, set up by the large amount of foreign substance inside the splenic pulp. If there is associated spasm of the splenic vein the dye is retained longer inside the spleen.

Summary

Splenic venography was done on 14 cases without untoward incidents.

Though there is slight haemorrhage from the spleen the procedure is safe.

The venogram shows the size and patency of the splenic and portal veins.

The intrahepatic branches of the portal vein are visible in a normal venogram, but, depending on the degree of obstruction, they are either absent or are faintly made out in venograms of cases of cirrhosis of the liver.

In portal hypertension the inferior mesenteric and left gastric veins may become visible and their prominence and tortuosity may be a measure of the degree of hypertension.

In splenomegaly without portal hypertension or cirrhotic changes in the liver the splenic and portal veins are dilated and tortuous and are fainter in outline than in normal cases. In these patients and in cases of cirrhosis of the liver the splenic and portal veins are sometimes so dilated as to resemble a loop of intestine (see Fig. 4).

ADDENDUM.—Since the submission of the paper for publication we have carried out splenic venography on four cases of cirrhosis of the liver, two of nutritional oedema, and three of splenomegaly of unknown aetiology without any untoward incident. The conclusions drawn in the paper have been corroborated.

We are much indebted to Dr. A. K. Dutta Gupta, Principal-Superintendent, Nilratan Sarkar Medical College, for giving us the facilities for carrying out this investigation. Our thanks are also due to Dr. S. Mitra, the Registrar, and Drs. M. Gupta, G. Chanda, and G. Melhotra, the house officers to the associate professor of medicine, and to Drs. M. Mukherjee and R. Roychoudhary, the radiologist and assistant radiologist respectively of the Nilratan Sarkar Medical College Hospital, for their help and co-operation.

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On Thursday last a plaque was unveiled on the wall of an old people's home in the King's Road, Chelsea, to commemorate the association of Sir Hans Sloane with the district. Sloane was born in Ireland in 1660. He studied medicine in Paris and Montpellier and graduated at Orange in 1683. He became a fashionable London doctor and a Fellow of the College of Physicians and of the Royal Society. In 1687 he sailed to Jamaica as physician to the Duke of Albemarle. From there he brought back a large number of plants and animals which formed the basis of his famous collection of specimens and books. As a physician he was as well known for his charity as for his professional skill, and devoted part of his salary to establishing a dispensary for the poor. He was elected secretary and later President of the Royal Society, and in 1716 he was made a baronet. He did not live permanently in Chelsea until 1742, but it was there that he died in 1753. In his will he left his famous collections to the nation, and they were housed in a building on the site now occupied by the British Museum.

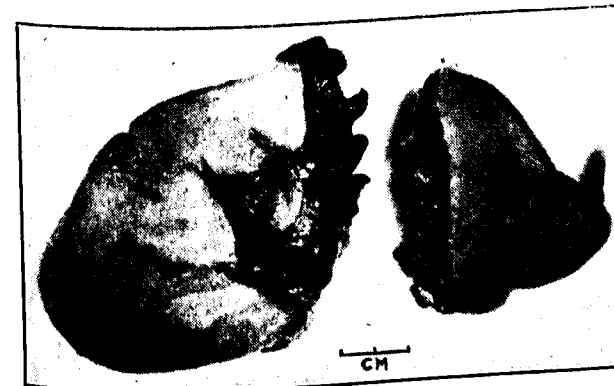
Medical Memoranda

Unusual Case of Rupture of Spleen

The following case of traumatic rupture of the spleen was treated recently at Cardiff Royal Infirmary.

CASE REPORT

The patient, a lusty young miner aged 28, was admitted on a Saturday evening complaining of upper abdominal pain and of dyspnoea. Twenty-four hours before admission he had been knocked down by a cyclist. When the accident happened he had just left a public-house where he had drunk "about ten pints" (5.7 litres) of beer. He had not been concussed but was unable to remember on which part of his body he had been hit. He had immediately got up, and had exchanged suitable imprecations with the cyclist, and had then walked four miles (6.4 km.) to his home. He had gone to bed and had been woken from sleep by upper abdominal pain which interfered with his breathing. This had persisted up to the time of his admission to hospital. On examination the most striking finding was a respiration rate of 40 a minute with the alae nasi moving vigor-



ously. There was no cyanosis, pallor, or sweating. The pulse rate was 92 and the blood pressure 130/80. The skin was warm even on the extremities and the skin circulation was brisk. The abdominal wall did not move freely on respiration and there was muscle guarding and tenderness to deep palpation all over the abdomen. Marked tenderness, muscle rigidity, and persistent dullness to percussion were present in the left upper abdominal quadrant. Left shoulder pain was absent, nor was it produced by raising the foot of the bed for 10 minutes with the patient lying flat, after the manner suggested by O'Connell (1951). A diagnosis was made of incomplete rupture of the spleen. An hour or so after admission the abdomen was opened by an upper left paramedian incision. The peritoneal cavity contained a quantity, estimated at 1 to 2 pints (570 to 1,140 ml.), of fluid blood and some clots. On retracting the left edge of the wound the lower pole of the completely ruptured spleen (see photograph) was seen lying quite free and unattached on the front of the greater omentum. It was simply picked out of the abdomen. The main mass of the spleen was lying in its normal position with the hilar vessels intact. The surface of rupture was covered by clot, and at the time of operation haemorrhage from this surface was certainly not brisk. Splenectomy was completed without difficulty and the patient made an uneventful recovery. Two pints (1,140 ml.) of blood was transfused during and immediately after operation. Histological examination of the spleen revealed no abnormality.

COMMENT

That rupture of the spleen not uncommonly presents in a clinically covert manner is, of course, well known. The pathological explanation is that haemorrhage is arrested or

retarded by blood clot. Conditions favourable to the formation of a localized clot, such as tearing of a small hilar vessel or partial or subcapsular rupture of the spleen, are generally present. The interest of the case reported lies in the fact that the same mechanism was effective in retarding haemorrhage in a patient whose spleen had suffered injury severe enough to amputate and to dislocate its lower pole.

I am indebted to Mr. J. B. Haycraft for permission to publish this case history.

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Rupture of Spleen in Infectious Mononucleosis

Spontaneous rupture of the spleen is rare except in districts infested with malaria. Among recorded diseases associated with spontaneous rupture are arteriosclerosis, arterial degeneration, sarcoidosis, lymphatic leukaemia, and glandular fever or infectious mononucleosis.

In the records of the United States Army Institute of Pathology infectious mononucleosis accounts for 7 out of 44 cases of spontaneous rupture of the spleen, and is second in frequency to malaria, which was responsible for 22.

CASE REPORT

A man aged 23 was seen on February 6, 1952, as an acute abdominal emergency of 24 hours' duration. He complained of upper abdominal pain of a continuous nature since 5 a.m. on the previous day. The pain was felt in the left hypochondrium and the epigastrium, and there had been some distension in this region. Vomiting had not occurred, but he had had several attacks of nausea on the previous day. There was no history of trauma. He had not eaten a meal for over a week. His bowels were normal up till the previous day, when an attack of diarrhoea occurred. His urine was "strong," but otherwise normal. He had no cough and no backache. For the past two months he had been off-colour and claimed to have lost 28 lb. (12.7 kg.) in weight during this time. Seven days ago he had had a quinsy which had cleared up on sulphathiazole, 1 g. four-hourly for five days. Two days ago he had an attack of severe abdominal pain which doubled him up and lasted 15 minutes. Pain also occurred in the left supraclavicular region for a short period. There was no other significant past history.

On examination the patient was seen to be pale and a little wasted. His temperature was 100.6° F. (38.1° C.), pulse 100, respirations 28, blood pressure 145/90. The throat showed slight inflammation, but no peritonsillar abscess or membrane. The abdomen was distended, especially in the upper part; no visible peristalsis. On palpation there was slight tenderness and guarding all over. No masses were palpable. The spleen was not palpable. On percussion the abdomen was tympanitic, except that on percussing along a line from the left axilla to the umbilicus there was a band of dullness 2 in. (5 cm.) wide just above the costal margin. It was continuous with cardiac dullness medially, and faded away laterally. On auscultation there was complete silence in the abdomen. Per rectum definite tenderness was found in the rectovesical pouch. Routine palpation in the axilla, groin, and neck revealed a few lymph nodes that were hardly worthy of attention and were indistinguishable from old septic glands. The chest and heart were normal. On the physical signs a diagnosis of "blood in the peritoneal cavity? cause?" was made.

Laparotomy was performed under gas, oxygen, and ether (Dr. Roberts). A right paramedian incision was made. As soon as the peritoneum was incised blood welled out. On exploring the abdomen the spleen was found to have two tears on its convex surface, surrounded by a large volume of blood clot. The incision was extended with a left transverse cut dividing the right rectus muscle, and splenectomy performed. All blood was removed from the abdomen. No other abnormality was detected. The abdomen was closed without drainage.

After operation a routine blood count showed: red cells, 3,050,000; Hb, 64% (8.2 g.%); colour index, 1.08; white cells, 22,000 (N. polymorphonuclears 47%, lymphocytes 39.5%, monocytes 13%, N. metamyelocytes 0.8%); one normoblast seen in counting 200 white cells; anisocytosis; platelets normal in number; many atypical lymphocytes present; ? glandular fever. A review of the case was then made and glandular fever seemed to be the correct diagnosis.

The Paul-Bunnell test showed:—first post-operative day: patient 1 in 24, control nil; seventh post-operative day: patient 1 in 96, control nil; fourteenth post-operative day: patient 1 in 24, control nil.

The patient was given aureomycin, 2 g. at once, and 0.5 g. six-hourly for four days. He made a satisfactory convalescence, and was discharged home on the sixteenth day in good health, when the white-cell count had fallen to 11,300 (N. polymorphonuclears 41%, eosinophils 6%, lymphocytes 43%, monocytes 10%).

The following pathological report on the ruptured spleen was received. "Microscopical Report:—Spleen (18 by 10 by 4.5–6.5 cm.; 580 g.). There was a large double cruciate tear on the medial surface (upper pole). Capsule entirely stripped from convexity of spleen ? following subcapsular haemorrhage. Pulp semi-fluid due to autolysis resulting from the usual failure of fixative to penetrate splenic tissue in bulk. (The peripheral 0.5 cm. of pulp was well fixed.)" "Provisional Histological Report:—The splenic pulp is unusually cellular. Most of the cells are mononuclears, including lymphocytes, lymphoblasts, and atypical larger cells. Plasma cells are present. There is an unusual proportion of polymorphs in the pulp. Some sinuses are distended with atypical mononuclears. Similar cells have infiltrated the capsule to a slight extent. There is a fresh subcapsular haemorrhage. The follicles are small and widely spaced, germinal centres are practically absent. Spleen: rupture (infectious mononucleosis)."

When seen 12 weeks after discharge the patient was quite well and the white blood cells numbered 8,400 per c.mm. (monocytes 10%). Many of the lymphocytes were atypical.

COMMENT

In 1922, before infectious mononucleosis as a separate clinical entity was recognized, Friesleben described spontaneous rupture of a spleen in a patient who was probably suffering from this disease. Since then a number of cases have appeared in the literature (King, 1941; Ziegler, 1944; Davis *et al.*, 1945; and Smith and Custer, 1946).

Usually some history of minor trauma prior to the rupture is obtained. It may be straining at defaecation, twisting in bed, or a definite slight blow. Signs of rupture may follow at once or appear in a few days, either suddenly or after symptoms suggesting intermittent bleeding. Rupture mostly occurs after the fourteenth day of the disease, suggesting that the changes in the spleen require this time to produce enough fragility in the organ for spontaneous rupture to occur. Ziegler described one fatal case, and four of Smith and Custer's seven patients died.

Histology.—The capsule is infiltrated with lymphocytes and large mononuclear cells, and there is oedema of the capsule and the subjacent pulp. The trabeculae are infiltrated with mononuclear cells to a greater degree than the capsule. A varying degree of dissolution of the trabeculae is present. Splenic pulp is increased in bulk and the pattern is blurred. The blood sinuses contain mononuclears which are often densely packed. Follicles are few per unit area, are small, and lack germinal centres. The histological pattern is thus typical enough to enable a diagnosis to be made.

I am indebted to Mr. B. T. Rose for permission to publish this case.

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Pregnancy following Haematosalpinx

Pregnancy following haematocolpos and haematosalpinx is rare enough to justify recording the following case.

CASE REPORT

The patient was referred to Mr. V. B. Green-Armytage at the age of 17, after she had had a year of monthly pain, which was thought to be due to the delayed onset of menstruation. Mr. Green-Armytage, who has kindly supplied details which he has allowed me to record, states: "When seen, she had a typical haematocolpos and haematometra together with right and left iliac fossa pain suggesting overflow into the tubes. So the abdomen was opened. She had a bilateral haematosalpinx, and the distended uterus was sitting on the top of a mountain of haematocolpos. An assistant incised the anatomical vaginal defect and then I slowly milked the blood in the tubes into the uterus and away it went. There was just over one and a half pints of fluid (750 ml.), and I was interested to find on either side that a certain amount of the retained blood in the tubes was able to leak out of their fimbrial ends into the peritoneal cavity. Later I confirmed the patency of the tubes with carbon dioxide insufflation and salpingogram, and was able to give a good prognosis when she married."

Another gynaecologist who was present at the operation writes: "I well remember the haematocolpos, haematometra, and haematosalpinx which had further become haematoperitoneum. Vividly I recall the mahogany staining of the great omentum at laparotomy."

The patient was married in December, 1948, and became pregnant in February, 1951, at the age of 29. The only obstetric abnormality was some hydramnios. Labour started spontaneously at 42 weeks. The first stage lasted 18 hours and the second one hour. After an episiotomy, a 9½-lb. (4.3-kg.) baby girl was born spontaneously and thrived.

COMMENT

Because of its comparative rarity congenital vaginal atresia with its complications is only briefly described in most textbooks. However, in the Tropics the condition is by no means uncommon, and Mr. Green-Armytage's great experience there, together with the outcome in the above case, adds much weight to his opinion that laparotomy should be carried out in cases complicated by haematosalpinx.

Bernstein and Walter (1939) reported 19 cases of haematometra and thought that drainage from below is effective, thus avoiding a laparotomy. Curtis and Huffman (1950) stated that where there is haematosalpinx the tubes are usually closed. They believed that abdominal exploration should be reserved for those cases in which a pelvic mass remains after evacuation of the haematocolpos. In their review of 50 cases of congenital vaginal atresia, Christie Brown and Brews (1930) reserved laparotomy for those cases which had distended Fallopian tubes. They pointed out how undue abdominal pressure during examination could lead to tubal rupture, making salpingectomy and sometimes hysterectomy necessary.

When the tubes are found to be distended at laparotomy they should be emptied with care by milking blood into the uterus. If this is not possible, incision of the haematosalpinx (salpingostomy) would seem preferable to resection.

I have not been able to find in the literature a success similar to that in the above case, although in the opinion of Christie Brown and Brews the prognosis with regard to subsequent fertility in treated cases of haematocolpos is excellent. It is probable, however, that there have been similar cases, and it would be interesting to hear of them.

J. G. DUMOULIN, M.D., M.R.C.O.G.

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Reviews

GASTRIC ACID SECRETION

The Biochemistry of Gastric Acid Secretion. By Professor Edward J. Conway, M.D., D.Sc., F.R.S. American Lecture Series. (Pp. 185; 37 illustrations. 47s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

Professor E. J. Conway has written a stimulating and provoking book on one of the topics of great current biochemical and medical interest. It is a striking illustration of the unifying value of biochemical concepts that Conway discusses the mechanisms whereby the yeast cell can, under certain conditions, reduce the external pH to as low as 1.5 in considering the mechanism of HCl secretion in gastric mucosa, and is able to ascribe the production of acid in both instances to a K⁺ and H⁺ exchange. But, as he points out, "It is likely that the true analogy between the parietal secretion and the secretion of acid by yeast lies between HCl in the one and succinic acid in the other, the corresponding anions existing already in the cells." Conway puts forward cogent evidence to suggest that, with respect to gastric secretion, there are serious difficulties in assuming that the H⁺ ion donor is a metabolized acid and concludes that the donor is a reduced heavy metal catalyst operating in a redox cycle across a membrane. He considers the energetics for such a scheme, and elaborates the principle into the "redox pump" theory of the manner in which a cell performs osmotic work.

Conway considers that, in gastric secretion, the restoration to the active parietal cell of H⁺ ions removed in the oxidative phase of the redox cycle occurs through the ionization of carbonic acid, and the existence of carbonic anhydrase in the parietal cells is here of especial significance.

In discussing the ways in which the concentration of acid in the parietal secretion or in the gastric juice may be decreased Conway accepts the theory, put forward by Fitzgerald and Murphy in 1950, that urease, present in the mucosa, may be of significance in producing ammonia from urea and may be of functional significance in protecting the mucosa against acid. This view is, however, criticized by others on the grounds that the urease is not in fact of endogenous origin, but such criticisms do not affect the validity of Conway's opinions as a whole. The value of urea therapy in the treatment of ulcer cases with dyspepsia resistant to the usual treatment is advocated and discussed in the light of these views.

Conway's hypotheses have by no means been accepted by everyone concerned in researches of this kind, but here we have a lucid and readable discussion of the author's views on work that is one of the growing points of biochemistry. To those who wish to read an account of an individual viewpoint in a field of controversial interest by a modern biochemical polymath this book can be confidently recommended, and for the doctor who wishes to savour something of the excitement of fundamental research in a field of medical importance no better *hors d'œuvres* could be found.

F. G. YOUNG.

SCIENCE OF NUTRITION

The Work of Sir Robert McCarrison. Edited by H. M. Sinclair, with additional introductory essays by W. K. Aykroyd and E. V. McCollum. (Pp. 327. 30s.) London: Faber and Faber. 1953.

This book contains a selection from the writings of Sir Robert McCarrison and a prologue made up of three essays, one by Dr. W. R. Aykroyd, who was for many years McCarrison's successor as director of the Nutrition Research Laboratories at Coonoor, another by Emeritus Professor E. V. McCollum, and a third written by the editor, Dr. H. M. Sinclair, and Mr. Selwyn Taylor. Much of the work reprinted is from books now mainly out of print or from journals not always easy to obtain.

The value of McCarrison's contribution to the science of nutrition, seen after an interval of fifteen to twenty years, is, in Aykroyd's words, "abundantly evident, and little importance need be attached to the occasional errors of an enthusiastic pioneer exploring new territory." A feature of this record is the contemporary interest of many of the conclusions drawn from McCarrison's own experimental work and observations. In an appreciation of McCarrison's studies Mr. Taylor concludes, "I know of no one else alive to-day who has contributed so much that is new to so many varied aspects of the goitre problem." McCarrison also recognized the special value of work on applied nutrition and summed up the situation in India in the following observation, which is as relevant to-day as when it was written many years ago: "Indeed the greatest of all problems in India at the present time is the adjustment of the population to its food supply. It is one that is capable of solution only by the people themselves: by the exercise of self-help; by the jettisoning of old habits and customs unsuited to modern economic conditions; by improvement in methods of agriculture, animal husbandry, and industry; and, above all, by restraint in reproduction."

We may join in the pleasure expressed by Professor McCollum in following McCarrison "through two decades toward the distant watch-fires of truth to express high regard for him as a man as well as an investigator," and at the same time share in this happy tribute to McCarrison on his recent seventy-fifth birthday.

B. S. PLATT.

RADIOACTIVE ISOTOPES

Radioactive Isotopes: An Introduction to their Preparation, Measurement, and Use. By W. J. Whitehouse and J. L. Putman. (Pp. 424; 154 figures. 50s.) Oxford: At the Clarendon Press. 1953.

The doctor of medicine in the world to-day, and more particularly to-morrow, cannot afford to forget the physics of his premedical training. Radioactive isotopes have come to stay and will be further developed for therapy and for various forms of investigation both at the bedside and in the laboratory. As a corollary, their production poses a problem in industrial and public health.

This new British publication is written by two physicists associated with the Isotope Division at the Atomic Energy Research Establishment at Harwell. "It is intended," they state, "primarily for the use of scientific workers who, while they may be experts in their own field of study, have no specialized knowledge of radioactive theory and technique." What need will it fulfil for the doctor of medicine?

The first three chapters are basically an exposition of the physical theory necessary. Chapter IV gives a useful account of the production of radioactive isotopes chiefly in the pile but also by cyclotrons. Chapters V and VI concern the detection and measurement of the radiations directly by particle counters and indirectly by virtue of the ionization produced; Chapter VI is perhaps rather ambiguously headed the "Gross Effects of the Radiations." With all this the modern medical practitioner in hospital, and especially his alter ego in medical research, needs to be acquainted. This volume will be a useful addition to his personal or departmental library. To his colleague, the hospital physicist, the work may well have a place on the bench. It is well supplied with tables and graphs, most, it is true, to illustrate the text, but many useful for day-to-day reference.

The last two chapters on "Some Applications of Radioactive Isotopes" and "Manipulation of Radioactive Material" can be helpful to both in the design of experiments and of routine work; neither is meant to be comprehensive but only illustrative.

The Oxford University Press have issued this book with their usual high standard of production, and they and the authors are to be congratulated on the absence of errors. (The reviewer is not competent to check much of the algebra.) Of necessity this has entailed delay, and the book reflects the state of knowledge at the end of 1950. It is too advanced for the beginner (for example, basic

definitions like those of the curie and roentgen do not appear till chapters V and VI respectively) and not sufficiently comprehensive to be a sole work of reference for the moderately initiated. Nevertheless, it should compete successfully with, and complement, several similarly not complete and earlier manuals published in the United States.

J. F. LOUTIT.

SOCIAL MEDICINE

Social Aspects of Disease. By A. Leslie Banks, M.A., M.D., F.R.C.P., D.P.H. (Pp. 373. 20s.) London: Edward Arnold. 1953.

At first sight this book by the professor of human ecology at Cambridge appears to be a small textbook on general medicine in that a chapter is devoted to each system. But deeper digging reveals that the author has considered the main afflictions of mankind and achieved order and clarity by his systematic and systemic approach. The work is intended for ancillary workers in the medical and medico-social services, by which is meant, no doubt, health visitors, almoners, and workers in voluntary organizations. But Professor Banks hopes that the book will also interest doctors and medical students—a modest hope which will certainly be fulfilled.

The detailed discussion of each disease is concise and well done. It is always a difficult task to write satisfactorily for both lay and medical readers. The bias here is a little towards the medical side, which from the doctor's point of view is a good thing, although in consequence some of the matter may be found a little too technical for others. There seems to be an occasional lack of proportion in the space given to difficult diseases. For example, plague is considered at about the same length as bronchitis. Plague is the more dramatic; bronchitis is now far more lethal and presents a grave social problem which surely needs much more space than two pages. Those who live and work in public health in the north, where mortality is more than 20% higher than that of the country as a whole, would have welcomed more consideration of the effects of climate and atmospheric pollution. But these are mild criticisms, heavily outweighed by the general and particular excellence of the book.

Random sampling of the index demonstrates that the indexing is of the same high and careful standard as the writing. The binding, paper, and printing are good, and better than one may reasonably expect at the price. This book is recommended to doctors who appreciate the importance of relating therapeutic medicine to social conditions—and I would hope that this applies to all doctors.

C. METCALFE BROWN.

A GREAT DENTIST

Dr. Howe and the Forsyth Infirmary. By Rollo Walter Brown. (Pp. 188. £1 2s. 6d.) Harvard: University Press. London: Geoffrey Cumberlege. 1953.

Between 1842 and 1854 four sons were born to the wife of William Forsyth, a prosperous Scot whose business was near Boston, Massachusetts. All four sons became rich, but only two married, and neither had any progeny. Yet they were fond of children and wanted their money to benefit the little ones, so, on the advice of a certain Dr. E. A. Johnson, they gave or left their money to found a large and palatial dental clinic—the Forsyth Infirmary. This clinic became the model for others in many parts of the world, and owed much of its success to the energy, ability, and initiative of Dr. Percy Howe, whose life-story is recounted in this book.

Percy Howe was a successful dental practitioner up to the age of 50, though he had an independent mind and, as best he could, carried out a certain amount of research in his spare time. When the Forsyth Infirmary was opened Howe was attached first as research worker and later as director, a post which he retained till he died at the ripe age of 85 in 1950. Under Howe's guidance the Infirmary became a centre of research and dental education whose

influence spread far and wide. Among those who were attracted by Howe's work were Sir Arbuthnot Lane, Sir James Mackenzie, Sir Arthur Keith, and, at a later date, Lady Mellanby.

Howe was years ahead of his time in many respects, but particularly in two. First, he realized, as Sir John Tomes had realized in this country 60 years earlier, that dentistry was a part of medicine and should have a course of training comparable to that required by the medical student. Secondly, he clearly appreciated that general diseases had an effect on the development and structure of the teeth, and therefore he advised that doctors and dentists should work more in collaboration and know more of each other's work.

Howe became attached to Harvard Medical School, and at the invitation of President Conant helped to found the Harvard School of Dental Medicine. There is no doubt that he helped to raise the status of dental education in America. His advice to dental students deserves to be quoted: "The best medicine for all who are buried in a profession is to find refreshment in other fields. They should make the acquaintance of eminent men. They should know good poetry and good prose, and they should learn how to write."

It is difficult for a writer who is neither a dentist nor a doctor to get the proper perspective in writing the life of such a man as Howe, but Mr. Rollo Walter Brown has succeeded in giving a good picture of Howe's personality. Incidentally, he has also given vivid vignettes of the brothers Forsyth. Listen to John Forsyth giving advice to a young girl: "Now don't put off too long doing the things you think you'll enjoy. Look at all these fine books I kept buying and meaning to read some day. But I waited for the day when I'd have lots of time. And now I fall asleep reading the newspaper."

ZACHARY COPE.

GROWING UP

Attaining Womanhood: A Doctor Talks to Girls About Sex. By George W. Corner, M.D. Introduction by Dr. Eustace Chessier. (Pp. 102; 14 figures. 6s.) London: George Allen and Unwin. 1953.

Attaining Manhood: A Doctor Talks to Boys About Sex. By George W. Corner, M.D. Introduction by Dr. Eustace Chessier. (Pp. 87; 16 figures. 6s.) London: George Allen and Unwin. 1953.

In these books Dr. G. W. Corner, pre-eminent as a scientist, leaves his backroom laboratories and assumes the roles of father and mother to the adolescent. He brings with him his natural charm and lucidity as well as unsurpassed knowledge of the physiology of reproduction, and wisely keeps as far as possible to the scientific side, leaving the reader to infer the morals from the story. The intended readers are girls aged 12 years and over, and boys presumably of similar age. The great difficulty is terminology, a matter on which Dr. Corner himself comments. He has avoided childish language and instead uses technical terms throughout—defining each when first used. Nevertheless, one gets the impression that the young will find it hard to read with understanding, or without frequent recourse to a dictionary.

The girl's book contains a section on the male and the boy's book a section on the female, and several of the chapters and illustrations are common to both. Parents with mixed families may therefore wonder why they should have to obtain two books when with slight modification one might have sufficed. There is in any case something to be said for making no distinction between the sexes where instruction of this kind is concerned.

The subject matter is as might be expected—comparative anatomy and physiology, ovulation, spermatogenesis, menstruation, conception, and childbirth, with reference to such matters as sex attraction and behaviour, masturbation, and venereal disease. It is all admirably done, and those parents who prefer their children to learn the facts of life from books rather than from themselves will find these among the best of their kind. None could be more authoritative.

T. N. A. JEFFCOATE.

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TREATMENT OF BREAST CANCER

For half a century the operation of radical mastectomy has been the orthodox treatment for early cases of carcinoma of the breast. From time to time minor modifications have been introduced and the indications for carrying it out have varied within narrow limits, but by and large the solution of this therapeutic problem has been substantially that suggested by Moore¹ in 1867 and pressed with such vigour by Halsted² from 1889. But for some years the value of this procedure has been seriously questioned. An early sceptic was the late Professor Gask, of St. Bartholomew's Hospital, at whose instigation Mr. Geoffrey Keynes undertook to treat cases of carcinoma of the breast by the implantation of radium needles. This treatment was applied alone or in conjunction with a much modified surgical extirpation. Later Professor McWhirter treated a large series of cases of early cancer by simple mastectomy followed by x-ray therapy to the axilla.

So firmly established had the practice of radical mastectomy become that even to question its value smacked of *lèse majesté*, and those who had the courage to look for other methods had to face, not only the barriers of reasoned resistance, but an array of prejudice which lifted the discussion out of the cool atmosphere of scientific argument and plunged it into a cauldron seething with emotion. In our opening pages this week we publish a report by Mr. I. G. Williams, Mr. R. S. Murley, and Mr. M. P. Curwen, of St. Bartholomew's Hospital, on a series of 1,044 cases treated by different methods, including a series treated by Keynes and a comparable series submitted to radical mastectomy. This series of cases is discussed and analysed with all statistical safeguards, and the most striking of the conclusions is that, in terms of survival, there is not much to choose between radical mastectomy and procedures entailing a more modest surgical removal. These writers point out how morbid conditions, particularly oedema of

the arm, are much more common after radical mastectomy, and we may naturally question whether this distressing price is worth while paying if the achievement in terms of survival is negligible. Recently McWhirter³ has announced his ten-year survival rates, and these compare favourably with most of those published after more radical methods of treatment.

However, before relegating the operation of radical mastectomy to the category of a useless but spectacular piece of surgical virtuosity, there are certain considerations to be weighed. A comparison of the value of two different treatments can, it is true, commonly be made only by a statistical analysis. No amount of armchair pathology can support a method which is found to fail in practice. The difficulty, so far as the ordinary observer is concerned, is that the science of statistics has become vastly elaborate, and the exclusion of disturbing variables is an advanced mathematical exercise. Consequently a statistical analysis presents a structure so intricate, so specialized, and so formidable that this complicated erection has to be taken to pieces by an expert before a flaw can be detected in some small piece of the mechanism, upon which the whole working depends. The unprejudiced observer may therefore be pardoned if he views with some reserve statistical arguments alleging that one method of treatment is better, as good as, or worse than another in its effect upon survival rates. While the statistical instrument may be the one which must be used to measure these comparative differences, possibly this instrument is as yet insufficiently tempered to fulfil the difficult task which it is called upon to perform.

At a meeting this year of the Association of Surgeons the treatment of carcinoma of the breast was discussed. In the opening address Mr. Hedley Atkins warned his audience that the claims of rival schools of therapy which they were about to hear were unlikely to differ very much. He pointed out that a large proportion of patients with this disease would be dead within three years whatever was done. Another large group would survive five years or more in the absence of all treatment. It was only in a small fraction that, in terms of survival, it mattered what kind of treatment was given. If this third group was very small, the differences between any two methods of treatment would be very small also and might require the most careful statistical survey to reveal them. But he rightly added that very small differences in percentage survivals are of supreme importance to the individual patients who survive. Moreover, in the statistical field there is no series before or since which over-

¹ *St. Bart's Hosp. Rep.*, 1867, 3, 133.

² *Surgical Papers (Halsted)*, Baltimore, 1924, 2, 3-50.

³ Meeting of Association of Surgeons in April, 1953.

⁴ *British Medical Journal*, 1938, 2, 1071.

shadows that magnificent achievement reported by Gordon-Taylor⁴ using radical mastectomy alone, in which his ten-year survival rates were 84% of stage-I cases and 29% of stage-II.

Although morbid sequelae are the bugbear of radical mastectomy, this operation has no monopoly in this respect. Oedema of the arm will occur, though less often, after deep x-ray therapy alone and not uncommonly appears before any treatment has been given at all. Furthermore, if a patient who has had a radical mastectomy performed and has subsequently received x-ray therapy is asked which of these two methods of treatment upset her the more, she will nearly always say x-ray therapy, and that quite emphatically. What modern statistical research has done is to shake surgeons out of a certain complacency about the results which they are entitled to expect from the operation of radical mastectomy. It has revealed alternative methods of treatment in a favourable light and has created a more eclectic attitude towards the problem. The days are gone when radical mastectomy is prescribed wholesale for all early cases of carcinoma of the breast.

Two questions need to be answered. First, is there a stage in many cases of cancer of the breast when, apart perhaps from a few stray cells which may lie for ever dormant within the embrace of the body defences, the growth is confined to the breast and to the glands in the axilla? Secondly, is the proportion of these cases sufficiently large to justify the risks of unpleasant sequelae in selected instances in order to cure them? If the answer to these two questions is yes—and it is so in the minds of many reasonable and experienced workers—then radical mastectomy still has a place, even if a limited place, in the treatment of cancer of the breast.

Perhaps long before this difference of opinion is settled its relevance will be as obscure as that of the humoral and Brunonian disputes of long ago. Neither surgery nor x-ray therapy will be the final answer in the treatment of this disease. Increasingly our hopes are set on the work of the endocrinologist, the virologist, and the experimental pathologist. In a paper at page 796 of this issue of the *Journal* Drs. B. A. Stoll and Frank Ellis review the effect of oestrogen therapy on pulmonary metastases. These workers demonstrate statistically what has been the universal impression, that in women well past the menopause the administration of oestrogens may produce a striking improvement in pulmonary deposits. Although the beneficial effects are only temporary, this palliation may be prolonged for some years. The increasingly favourable reports which are

coming in demonstrate the effectiveness of these materials in some cases of advanced cancer, and are a further pointer to the direction in which future investigation will lie. In the meantime a willingness to understand and to use all the weapons that are to hand, clumsy though they may be, and a freedom from prejudice in favour of any exclusive or uncompromising practice, will serve our patients best.

SMOKELESS ZONES

In 1935, Charles Gandy, a Manchester barrister, proposed the principle of smokeless areas as a method of reducing smoke pollution in our industrial towns. The National Smoke Abatement Society, of which he was chairman for many years, approached the Manchester Public Health Committee, which in consequence caused the central area of the city to be surveyed in 1938 as a preliminary step to the creation of a smokeless zone. The outbreak of war held up this scheme, and it so happened that the area was heavily damaged by air attack. After the war the area, 105 acres in extent, was again surveyed, and it was found that the premises within it, consisting mainly of offices and shops and only a few dwelling houses, had more than 2,000 open fireplaces, most of which were fuelled by bituminous coal. The heating system of many of the buildings had already been modernized, and coal had been replaced by electricity, gas, or coke. This central area was therefore deemed to be suitable for an experimental smokeless zone.

There are no statutory powers of general application for the creation of smokeless zones, and the Manchester City Council had to obtain the necessary power, which it did by the Manchester Corporation Act, 1946. This pioneer legislation empowered the city council, among other things, to create a central smokeless zone, and made provision for the creation of other unspecified smokeless zones within the city boundary, subject to conditions including the approval of the appropriate Ministry. The central zone came into being on May 1, 1952.

Subsequently, some 14 towns obtained similar powers by means of local Acts, and other Acts are pending—for example, for the City of London. The City of Coventry created the first central smokeless zone of 30 acres on March 1, 1951, by virtue of its Corporation Act, 1948. In order to establish a

¹ Brown, C. M., *Med. Offr.*, 1953, 90, 8.

² Wade, A., *Smokeless Air*, 1953, 87, 17.

³ Goodman, N., Lane, R. E., and Rampling, S. B., *British Medical Journal*, 1953, 2, 237.

⁴ Waller, R. E., *Brit. J. Cancer*, 1952, 6, 8.

⁵ Doll, R., *British Medical Journal*, 1953, 2, 521 and 585.

⁶ Clemo, G. R., *ibid.*, 1953, 2, 670.

smokeless zone in a developed area a local authority must proceed by private Bill—an expensive and lengthy procedure. A model clause for inclusion in private Bills for this purpose has been prepared by a committee of Parliament, and it would appear that the time is now ripe for supplementary legislation to permit any local authority to propose smokeless zones and so avoid the heavy expense of promoting private Bills. It is an expense contemplated by large authorities with proper hesitation, and an impossible burden on small authorities with meagre resources.

In a smokeless zone the emission of smoke from any building therein is prohibited and there are prescribed penalties for breach of the order. Smoke includes the visible and tangible products of incomplete combustion; it does not include deleterious gases such as sulphur dioxide. Protection is given in most local Acts against unreasonable action by local authorities, and local authorities are always required to contribute to the expenses incurred in making premises smokeless. There is no control over railway locomotives or of some mining processes—a freedom which is much abused.

The creation of a smokeless zone is not without its difficulties. First, it is essential to obtain the support of public opinion. Secondly, persuasion and diplomacy are required to convince owners and tenants of premises within the proposed zone that it will be a good thing for the community and themselves. Thirdly, expert advice must be freely available in order that the conversion of fuel-burning appliances will be the most suitable for particular conditions. Fourthly, patient explanation must be given to demonstrate that efficiency and economy go hand in hand and that smoke, besides being a nuisance, is in itself a waste of expensive fuel. There are other serious difficulties in relation to industrial operations, but none of them is insurmountable.

The results in Coventry and Manchester have been most satisfactory. Dr. Metcalfe Brown,¹ medical officer of health for Manchester, has been so impressed with the success of the first year's operation of the central zone that he has already recommended an extension marginally of the zone. The city council has approved, and, subject to the consent of the Ministry, the existing zone will be increased to 235 acres in extent on October 1, 1954. There is still plenty of Manchester left to be made smokeless in due course.

Manchester is the nucleus of a congested industrial conurbation of nearly 3,000,000 people. At first sight, to create a smokeless zone of a mere 105 acres in the centre of such a mass of smoke-producing

premises would appear to be a somewhat naive and quixotic gesture, with little hope of practical effect. But that effect has been achieved. The centre of Manchester is already clearer; there is a host of smokeless chimneys; the haze of smoke outside the zone contrasts markedly with the absence of visible smoke within the zone. The Press has commented favourably on "the hole in the fog." Business houses within the zone have written to the newspapers expressing appreciation of the results; commercial firms outside the zone have asked for extensions to include their premises; public opinion is strongly in favour.

At the annual conference of the National Smoke Abatement Society, which was held at Glasgow on September 30 to October 2, Dr. T. Morrison Clayton, medical officer of health for Coventry, referred to four categories of actual or potential smokeless zones. These were (1) industrial areas with heavy atmospheric pollution; (2) industrial areas with moderate pollution where redevelopment is planned; (3) residential areas in process of development; and (4) the environs of airports. Category (1) areas can be dealt with only by statutory legislation; areas in categories (2) and (3) and possibly (4) can be dealt with in the absence of special powers, for a planning or housing authority can usually apply conditions in relation to new buildings which would be difficult or undesirable to apply to existing buildings. Wade² has discussed the smokeless housing estate now in process of development by the Nottingham City Council—an excellent example of a residential area being developed (category 3). This scheme when completed will provide some 5,500 houses, 1,650 of which are already occupied. Each tenancy has a condition that no smoke will be emitted from the house and that all appliances using any solid fuel shall be fired by smokeless fuel. This is the largest smokeless area in this country. Coventry, Manchester, and Nottingham together have shown that smokelessness can be attained both at the centre and at the periphery of industrial centres.

Reduction of atmospheric pollution needs the support of the medical profession. There is a mass of evidence on the relationship between smoke and ill-health; for example, Goodman, Lane, and Rampling³ state, "There is no doubt at all that smoke associated with fog has a serious effect on the elderly and the chronic bronchitic in precipitating a mortal bronchopneumonia." Their data on chronic bronchitis demonstrate that the death rates from bronchitis in men aged 45–54 are highest in the regions of Newcastle, West Riding of Yorkshire, Liverpool, South-east Lancashire, and Birmingham. It is not a mere

coincidence that the atmosphere of these regions is heavily polluted. The presence of benzpyrene in city air has been reported by Waller⁴ and Doll,⁵ and by Clemo⁶ at a recent meeting of the British Association. The need for reducing the smoke menace is emphatic and clear.

THE RETURNED PRISONER OF WAR

The family doctor, consulted by a repatriated prisoner of war, may find that experiences during internment have had deep psychological as well as physical effects, and that the former are likely to be of special importance during the period of resettlement. The Serviceman never expects capture, and the violent change, affecting every detail of his life, strains all his bodily and mental resources. He is extremely depressed on capture. Weary, hungry, and longing for rest and security, he may be treated harshly and cruelly. The daily routine in which he had an established status has vanished. The customary habits are interrupted, and his individuality is lost. He is just one more prisoner, and his survival is of no interest to his captors. But this stage soon passes. He acquires new habits of life, accepts the grim situation, hopeful that somehow he will find means of escape. The group life of the camp, the irritations, the short tempers, the hard conditions, the monotonous and often insufficient food, the indefinite nature of his internment, are offset by efforts to score off his captors, to outwit them, and by a growing comradeship. The circumstances of his past life become idealized, and he pictures the future in rosy colours. Captivity, anyhow, will not last for ever; when he gets home he will live as he has never lived before. These dreams of the future are a necessary and valuable compensation.

Many soldiers, particularly professionals, experience a sense of guilt on capture. The notion that he may be regarded as an unheroic figure, since he is no longer fighting, can lead the prisoner to expect a loss of caste in the eyes of those at home. Men captured after a tough fight and when every round of ammunition has been fired are free of this thought. The feeling of guilt is always intensified by thoughtless letters from home criticizing the prisoner for his capture and mentioning his newly found safety.

Some of these returned prisoners at the difficult period of repatriation are now seeking their doctors' help. In the excitement of returning to his family, and with the prospect of realizing his dreams, the repatriated man has probably forgotten the inevitable changes that time has worked in his home and his friends. His family have been forced to deal successfully with life without him. His children or his

brothers and sisters have developed new interests. Should his wife have left him, he faces a catastrophic situation. The gulf between fantasy and fact is often extremely painful. The limited imagination of his family fails to picture the utterly different life he has led and is unequal to the strain of surrounding the returning soldier with sufficient sympathy. When the early days of home-coming have passed, the Serviceman may get the impression that in some way he has failed. The thought of personal guilt is repressed, becomes unconscious, and is projected. Then there come scathing remarks about politicians, employers, and those who in the security of home have become prosperous. The returned prisoner often has difficulty in resuming the daily financial responsibilities from which he was for a time free. In addition, his working skills may be impaired. In this atmosphere he may become aggressive, apathetic, or depressed, and perhaps alcoholic. Some even drift into crime as offering more excitement and a short cut to affluence. The problem of housing often intensifies the depression and resentment. Psychoneurotic symptoms—a fear of confined spaces, of crowds, of social occasions—may appear, and a tendency to exaggerate physical symptoms.

The doctor does not see those who grapple successfully with their difficulties. But the wise course with the man who consults him is to attend to his physical ailments and assure him at the same time that he is a normal person whose difficulties are in large measure due to the problem of resettlement. If the patient is unresponsive to simple measures, if he remains tense and maladjusted and suffers from insomnia, it is wise to call in a psychiatrist. Every man who has been a prisoner, even for six months, will be affected by it to some degree, and those who have been interned for two years or more will suffer more severely and their resettlement will be correspondingly difficult. Prisoners in Japanese camps during the second world war, and some in Korea, were always hungry. Food became the chief topic of conversation in prison camps and prison hospitals. Hunger overshadowed other instinctive tendencies, and sexual thoughts and activities faded. Abdominal symptoms are often mentioned by such prisoners on repatriation; they are concerned about bowel movements, and complain of vague abdominal pains. Digestive troubles are to be expected with the change of diet—for example, from rice to Service rations. Extreme cold was common in Korea, but usually the staple diet of Indian corn, although lacking in variety, was adequate. Considerations of this kind should be taken into account and a straightforward explanation of the symptoms given with firm reassurance that with

treatment the trouble will quickly settle down. A quite unnecessary dread of impotence often follows the diminution of sexual interest. Again and again repatriated prisoners assert that they have suffered physiological harm and that they will never be the same men again. This fear of impotence often leads to sexual incompetence on repatriation. The origin of the fear and the fact that it is common should be explained, and the assurance that it is groundless should be given and can be given with confidence. Neurosis is rare among returned prisoners of war, and was almost unknown in the survivors of Japanese prisoner-of-war camps. Most of those released from Japanese internment were in sound physical and mental health, for the weaker had not survived. Even so, many were anxious about their health.

The difficulties of resettlement rather than the hardships of internment are likely to be the precipitating factor in neurosis. The physical complaints of young repatriated men can usually be treated on familiar medical lines, but psychological symptoms may be persistent. The doctor should avoid comments on imaginary illness and avoid also the words prisoner of war, or prisoner, for they are unpopular with ex-prisoners. No reference should be made to the circumstances of capture, and even when the patient mentions the subject discussion should be brief. The doctor asked to support a claim for a disability pension should be sympathetic but cautious. A pension has inevitable charms, but its effect on character may be detrimental. The patient must be encouraged to take up his civil life without delay. At every employment exchange there is an official whose special task is to advise on any employment problem, and to give information on the training schemes available for men who want to learn a trade or to enter a profession. The period of resettlement need not be unduly difficult. It is a transitional period when timely advice and informed common sense can modify unprofitable attitudes of mind towards illness and towards society.

ANAL FISSURE

The general practitioner is commonly presented with cases of fissure in ano most of which respond quickly and satisfactorily to simple treatment. It is perhaps not well enough known that simple measures, properly supervised, will relieve the distressing symptoms of this common condition. Only a small minority of patients with anal fissure ever require operative treatment, such as that described by Mr. E. S. R. Hughes at page 803 of the *Journal* this week. Many of them would not need such radical treatment if they were properly managed in the first instance.

The most painful fissures are commonly the smallest and earliest ones. Contrary to widespread belief, a

sentinel pile is not often seen in association with a fissure, and the linear acute fissure can be diagnosed without subjecting the patient to a painful examination. As Mr. Hughes rightly emphasizes, it is essential to secure the co-operation of the patient and to examine him gently and reassuringly. Once the fissure is seen, it is possible to anaesthetize the raw surface quickly and efficiently with 10% amethocaine or cinchocaine ointment. It can be best applied by firmly twisting a small pledget of wool on to an orange-stick, dipping the wool in the ointment, and then gently inserting it into the anus and in contact with the fissure. Within a few minutes the doctor can pass a finger gently and painlessly, and the very fact that he can do so greatly helps to secure the patient's confidence.

After the initial examination the patient is provided with 3% amethocaine ointment and a metal or plastic dilator. The ointment should be gently applied to the site of the fissure once or twice daily (and invariably ten minutes or so before a bowel movement) and the dilator then passed. Patients vary in their ability to grasp the importance of this treatment, and it is essential for the doctor, or a suitably trained nurse, to explain the procedure carefully and to supervise the patient daily at first. The properly instructed patient can then be seen at intervals, and his condition will generally be relieved in two or three weeks. Occasionally treatment is needed for a longer period, but, with attention to detail, rarely will this simple regime fail.

Skin sensitivity, as Mr. Hughes points out, sometimes occurs with local analgesic ointments, but it is less frequent if 3% instead of 10% ointment is applied. Some doctors administer only a 1% ointment, and certainly, once the patient's initial anxiety and sphincter-spasm are relieved, there is a good case for using a weaker preparation. If the patient is taught to apply only a small amount of ointment precisely to the fissured area, and if a simple lubricant is used on the dilator, the chance of skin sensitization is still further reduced.

Most proctologists will agree with Mr. Hughes's opinions on injection treatment and digital dilatation of the anus under general anaesthesia. When we come to that small but hard core of cases with chronic and complicated fissures which really need operation, there are arguments for and against the orthodox operation of excision and the one advocated by Mr. Hughes. There is no doubt that the site of excision needs careful supervision, both while epithelizing and shortly afterwards. During the latter period the epithelium is unstable and the underlying scar tissue is still rather rigid. Nevertheless it is remarkable how soft and normal the anal margin becomes. The theoretical advantages in applying an immediate skin graft are considerable, and those who practise the technique carefully will be satisfied with the results. Surgeons with experience of skin grafting will need no reminding that the after-care of cases treated in this way must be no less careful than that accorded to the granulating area after simple excision. There is, perhaps, no need to adjudicate on the relative merits of simple excision and excision with primary grafting, for each method has a place in treatment. Some will feel that there is no place for skin-

grafting a small area, but where larger areas of skin have to be excised there would seem to be much merit in applying a graft.

SPLENIC VENOGRAPHY

Portal hypertension which has caused haemorrhage from the oesophagus or upper part of the stomach has been successfully treated by anastomosing the portal vein or one of its tributaries to a systemic vein.^{1,2} The obstruction to the portal blood may be either intrahepatic, as in cirrhosis of the liver, or extrahepatic, commonly due to obliteration of the portal vein or its replacement by tortuous varicosities (portal cavernoma), and it is not easy pre-operatively or sometimes even at operation to distinguish between the two conditions. The distinction is important practically, because in extrahepatic obstruction only a spleno-renal shunt is likely to be possible, whereas in intrahepatic obstruction a spleno-renal or porto-caval anastomosis might be carried out. Boulvin *et al.*³ first showed that it was possible to outline the splenic veins by splenic puncture and injection of a radio-opaque substance into the spleen, and later Dreyer and Budtz-Olsen⁴ used the same method in eleven cases.

In this issue of the *Journal* Drs. N. R. Konar and A. N. Sen Gupta report at page 810 the results of splenic venography in fourteen cases and indicate the dangers and possible uses of this method of investigation. Under local analgesia a lumbar puncture needle is inserted in the ninth left intercostal space and pushed into the splenic pulp; 20 ml. of a radio-opaque dye is injected as quickly as possible. Films are taken just before and 5 seconds after the completion of the injection. The radio-opaque substance leaves the spleen rapidly and passes via the splenic vein into the portal vein, outlining both these vessels and sometimes their tributaries. Obstruction of the splenic vein or extrahepatic obstruction of the portal vein can be shown clearly by this method.⁴ In portal hypertension due to cirrhosis, the splenic and portal veins appear dilated and tortuous, but a similar appearance may sometimes be seen in patients with considerable splenic enlargement and increased splenic blood flow without portal hypertension. No serious ill effects after splenic venography have been encountered in the small number of cases reported so far, and the procedure seems to be reasonably safe. The chief dangers are haemorrhage into the substance of the spleen or laceration of its capsule with bleeding into the peritoneal cavity, and splenic venography, by this method should not be used unless all facilities for carrying out an emergency splenectomy are available.

Diagnostic splenic puncture is rarely performed in Britain because of the risk of tearing the spleen, and the same caution should be observed in carrying out splenic venography. The reported number of cases in which it has been used is very small, and it must still be regarded as being in the experimental stage. However, in cases with gastric and oesophageal bleeding due

to portal hypertension it may supply the surgeon with valuable pre-operative information about the site of the obstruction and may indicate which type of anastomosis is most likely to help.

UNIT FOR SPASTIC CHILDREN

Just a year ago, on October 15, Lord Horder formally opened the Swindon unit for spastic children. In an interesting account of it that has recently appeared¹ Drs. J. B. Stewart and J. Urquhart, the medical officers of the unit, describe how it came to be founded. In 1951 it was known that there were eighteen spastic children in the district, but only one of these was accepted for admission to a special school for spastic children. The reasons for refusal were because the children were too young, too severely handicapped, or not sufficiently intelligent. There seemed no hope for the remaining seventeen children. These children, with fourteen others who were subsequently referred by paediatric and orthopaedic consultants, were all examined in the department of physical medicine of Swindon Hospital. Both parents of each child were asked to attend the examination, and the situation was carefully explained to them and their active co-operation was invited. A parents' association was formed, and when they found at last that interest was being shown in the plight of their children their enthusiasm and appreciation became embarrassing. Regular visits on one morning a week were arranged, and it soon became apparent that once more a gleam of intelligence could be detected in these unfortunates whose brains had been so severely damaged and who appeared to be afflicted beyond hope of help.

The authors appealed to the hospital management committee and to the local education authority in order to enlarge the scope of the work. They suggested that this could be done through the provision of a schoolroom in the department of physical medicine and by the appointment of a teacher. The authorities agreed, and provided the necessary funds for the unit. Ten of the spastic children were regarded as suitable for treatment and education in the new unit. The others were sufficiently well to be educated in ordinary schools or were too young to need more than treatment without education. Special school furniture was made in the department, and the teacher was given an opportunity of studying her pupils when they were being treated by the physiotherapists. A speech therapist was appointed for one session a week. The active co-operation of the parents was considered an essential in the training of the children. After a trial period of half-time schooling a programme of a full day of work and treatment was established and a mid-day meal was provided.

Those who have seen this unit at work are convinced of its value and of its success. It encourages the parents and treats the spastic children, and above all gives them a chance to acquire some education which otherwise might well have been denied them. The success of the Swindon unit offers an example and a challenge to those in other areas.

¹ Hunt, A. H., *British Medical Journal*, 1952, 2, 4.

² Walker, R. M., *Lancet*, 1952, 1, 729.

³ Boulvin, R., *et al.*, *Acta chir. belg.*, 1951, 50, 534.

⁴ Dreyer, B., and Budtz-Olsen, O. E., *Lancet*, 1952, 1, 530.

¹ *Ann. phys. Med.*, 1953, 1, 245.

CLINICAL PATHOLOGY IN GENERAL PRACTICE THE PUBLIC HEALTH LABORATORY SERVICE

BY

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There is a growing demand from general practitioners for direct access to the laboratory. Since the Public Health Laboratory Service already provides the practitioner with assistance in the diagnosis of infectious diseases it may be appropriate to discuss the scope and usefulness of this service.

Some practitioners make much more use of the laboratory than others. A number of severe infections have now become rare, many respond to various of the new drugs, and difficult cases can usually be transferred to hospital without delay. Therefore many practitioners find it possible to carry on with little or no help from the laboratory. Others make regular use of the facilities provided, and believe that this enhances the quality and interest of their work. They realize that they have a responsibility to prevent disease as well as to cure it, and that outbreaks of infection cannot be controlled unless their existence is promptly recognized. They find that the identification of the organism causing an infection often enables them to make more intelligent use of antibiotics. The regular use of the laboratory assists them to form and control their clinical judgment and to assess the results of their treatment. The interest of the work is increased when they can obtain assistance in the investigation of new and unusual conditions.

There is a tendency to belittle what is called "postal pathology," in which the pathologist does not see the patient either in his bed or in the laboratory, but if laboratory facilities are to be widely available some such practice is inevitable. It leads to undesirable results only when the practitioner uses the laboratory as a slot-machine to deliver mechanical answers to a few questions, and when the pathologist reports with a rubber stamp. Much of the work of the P.H.L.S. is of a "postal" nature, but this does not prevent a good deal of valuable co-operation between the practitioner and the pathologist. The practitioner must have enough knowledge to request the appropriate investigation at the right time, must have been trained to collect specimens efficiently, and must provide the pathologist with sufficient information to allow him to assess the significance of his findings. The pathologist does not content himself with mechanical reporting, but takes every opportunity to discuss his results with the practitioner, usually over the telephone, but occasionally in the laboratory or at the bedside. He welcomes inquiries about appropriate investigations for particular cases and encourages visits to the laboratory to establish personal contact.

It is often desirable to transmit specimens to the laboratory by some means quicker than the post. In suitable cases relatives can be detailed to take them to the laboratory or to put them on a bus or a train. Many public health departments have collecting centres for specimens, and in some populous districts the P.H.L.S. organizes "specimen collection rounds" with calls at a number of such centres. The practitioner should con-

sult the nearest public health laboratory or health department about the arrangements available in his area.

Nature and Scope of the Services Provided

There are 60 area and regional laboratories of the P.H.L.S., and in areas in which a laboratory has not yet been established arrangements have usually been made for the work to be done at the local hospital laboratory. The laboratories provide help in the diagnosis, prevention, and control of infectious diseases in the following ways: (1) with the general practitioner, by assisting in the diagnosis of suspected cases; (2) with the medical officer of health, by taking part in the investigation of established outbreaks and in the routine control of water, milk, food, and other environmental factors; and (3) on a national scale, with the central reference laboratories of the service, and with the Ministry of Health, by making observations on the spread of disease.

The diseases with which the service concerns itself are those that can be transmitted from man to man and from animals to man. The diagnosis of venereal disease is the one exception to this rule. Although this is generally the responsibility of the hospital laboratory service, arrangements differ from one area to another, and in some places the public health laboratories continue to carry out this work. Certain bacterial diseases, such as coliform infections of the urinary tract, are not strictly infectious. Their investigation is also the concern of the hospital laboratory service. It is best to make inquiries locally if there is any doubt about the correct laboratory for any particular specimen. Public health laboratories provide outfits for the collection of specimens, but do not pay the postage on packages returning to the laboratory.

The local laboratories of the service carry out a wide range of bacteriological investigations. In addition, they avail themselves of facilities at the reference laboratories for the more unusual and difficult tests.

Respiratory Infections

Sore Throat.—In the past, the main purpose of sending a throat swab to the laboratory was to exclude the presence of diphtheria. Now that this disease is less common, more attention can be given to identifying other causes of sore throat. However, the exclusion of diphtheria is still a matter of importance. It is unlikely that this country can be kept permanently free of the disease, even if the present level of immunization is maintained, and there is a danger that recrudescences might not be recognized promptly. Diphtheria in immunized persons is often clinically atypical, and the examination of the throat swab may be of most value in those cases in which the disease is not seriously suspected. Most laboratories issue a provisional report by telephone on the morning after the receipt of a swab, unless it arrives very late in the day. This report will state whether diphtheria bacilli, haemolytic streptococci, or Vincent's organisms are present, and will usually indicate whether they are few or many. On the following day the cultures are re-examined for diphtheria bacilli. A small proportion of previously negative cultures are then found to be positive, but fortunately this occurs rarely in clinical cases of diphtheria. On the second day, also, the haemolytic streptococci will have been grouped and the final report will be issued by post. When submitting a swab, the practitioner should include a brief account of the illness, and state

whether antibiotics or sulphonamides have been given. If diphtheria bacilli are found in the absence of typical symptoms, the laboratory will carry out a virulence test. The giving of penicillin locally or systemically may result in a false negative result for diphtheria. Small numbers of haemolytic streptococci are found in the throats of 10% of normal people in winter, but large numbers are usually present in streptococcal sore throat. Only a few may be present if the swab is badly taken (from the mouth rather than the fauces), or if specific therapy has been employed. A small proportion of swabs from undoubted cases of streptococcal infection, even of scarlet fever, will be negative. Haemolytic streptococci of groups A, C, and G are pathogenic for man, and the other groups can be disregarded as causes of upper respiratory infection. All are penicillin-sensitive. Vincent's organisms are found in large numbers in association with a well-defined clinical type of throat infection, and also occasionally in some blood diseases and in glandular fever. Small numbers may be present in the normal throat. The interpretation of a positive result is therefore a matter of clinical judgment. The laboratory does not usually mention the other types of bacteria present in throat swabs, as none of them is known to be associated with any particular disease of the throat. Swabs from about 50% of cases of sore throat are negative for any recognized pathogens.

Nose and Ear Infections.—All organisms grown from swabs of nasal and aural discharges will be mentioned in the report, with the exception of *Staphylococcus aureus* and non-pathogenic types of *Neisseria* in the nose, as any or all of them may be of clinical significance. As treatment will probably be directed to their elimination, it is usual to perform antibiotic sensitivity tests.

"Pneumonia."—Requests for bacteriological examinations in connexion with uncomplicated cases of lobar pneumonia are rarely made nowadays, as prompt response to chemotherapy is the rule. However, culture of the sputum may be very valuable if the case is unusually severe, clinically atypical, or does not respond to treatment. In addition to pneumococci, the examination may reveal *Staph. aureus*, Friedländer bacilli, or *Haemophilus influenzae* in large numbers, and in such cases the sensitivity to antibiotics should be determined. Sputum examination in more chronic conditions may result in the detection of an unexpected case of tuberculosis or fungus infection. Since the remarkable change in the prognosis of lobar pneumonia more attention is being given to the so-called atypical pneumonias. In addition to a routine sputum culture, the practitioner may request an examination of the patient's serum for various antibodies. Two of the diseases detectable by this means are of animal origin (and therefore preventable) and one is susceptible to antibiotic treatment. Serological tests for the following diseases are now in routine use: (1) "primary" atypical pneumonia, which is associated with cold agglutinins and the agglutination of streptococcus MG; (2) Q fever, a rickettsial disease which in this country is probably transmitted from cattle to man in milk or in dust; (3) infection with viruses of the lymphogranuloma-psittacosis group, which follows contact with many species of birds and is susceptible to aureomycin treatment; and (4) pneumonia following a recent influenza A or B infection.

Tuberculosis.—The laboratory will examine sputum, pus, urine, cerebrospinal fluid, and other materials for tubercle bacilli when requested, or when the history or pathological findings suggest the advisability of doing so. First, a microscopic search will be made, either on untreated or on concentrated material. There is usually little doubt that the acid-fast bacilli present are tubercle bacilli, though many strains of saprophytic mycobacteria are morphologically indistinguishable from tubercle bacilli. The laboratory ensures that its collecting receptacles are free from such saprophytes, and doctors obtaining specimens should take similar precautions. In some materials, such as urine, saprophytic mycobacteria occur commonly, and here a

positive microscopic finding should be confirmed by culture or animal inoculation. Few pathologists like to report "Tubercle bacilli present" on a microscopic examination of any material, and most prefer the phrase, "Acid-fast bacilli present." However, they will generally make it clear when they consider that confirmation of the microscopic findings is necessary. Practitioners should not hesitate to ask for confirmation when the clinical condition and the result of microscopy appear to conflict. Culture and guinea-pig inoculation are also used to detect small numbers of tubercle bacilli when the microscopic examination is negative, but the result is not available for three to six weeks. The laboratory should be left to decide which of the two tests to employ.

Whooping-cough.—A correct diagnosis of whooping-cough is usually made by the practitioner or the patient's mother. Laboratory help is valuable in the atypical case, particularly where symptoms are modified by vaccination. Since chloramphenicol appears to be effective only when given within a week of onset, it is important to establish the diagnosis of an atypical case if there is an infant among the family contacts. The pernasal swab—a fine flexible wire swab which is passed backwards along the floor of the nose—is the most convenient and effective means of collecting material. Unfortunately it takes three to four days to complete the bacteriological examination. With present methods 80 to 90% of cases give a positive result in the first two weeks of the disease. The number of positives will be increased by taking two swabs, one through each nostril. Specimens should reach the laboratory on the same day unless a special transport medium is used.

Gastro-intestinal Infections

Diarrhoea with or without vomiting and fever is due to a variety of agents, including the dysentery bacilli, the salmonellae (including *S. paratyphi B*), staphylococcal enterotoxin, certain strains of *Clostridium welchii*, and, in infants, some serological types of *Bacterium coli*. Though it is often possible from the clinical picture to suspect the nature of the infection, bacteriological examination alone can reveal this with certainty. Failure to establish a bacteriological diagnosis seldom does much harm to the patients, as most recover during or some time after a course of treatment. However, there are great variations in severity from case to case of the same disease, and a mild attack of dysentery or salmonella infection may be followed by a severe or even fatal infection among the patient's associates. Bacteriological examination may reveal an unexpected connexion between a number of cases and lead to the identification and elimination of a source of infection. Although fairly rapid transmission of faeces specimens to the laboratory is desirable, most pathogens survive well enough to make postal specimens highly effective in acute cases. In the occasional case in which amoebic dysentery is suspected, a specimen should be examined within a very short time of being passed: it may be possible to arrange for the patient to defaecate at the laboratory. Rectal swabs are useful in some circumstances, as they can be conveniently and quickly collected. Some laboratories provide a special apparatus, but a moistened throat swab is quite effective if it really reaches the rectum. In acute cases of diarrhoea the results are good, but in convalescent cases and in typhoid fever they are inferior to those of faeces culture. Rectal swabs must reach the laboratory within a few hours. In most acute salmonella and dysentery cases a provisional report may be given on the day after the specimen is received. A final negative report is usually given at 48 hours and the exact identification of a pathogen may take longer.

Unexplained Pyrexia

There are a number of febrile conditions in which the laboratory can be very useful. The blood can be examined for evidence of typhoid fever, Weil's disease, undulant fever, glandular fever, infectious endocarditis, and a number of

other diseases. The laboratory will supply outfits for the collection of blood for culture and for serological tests, together with a sterile syringe. Many practitioners find it convenient to keep such an outfit in readiness. The pathologist will always be pleased to give advice on the appropriate investigations in cases of unexplained pyrexia.

Infections of the Central Nervous System

The practitioner may not often be called on to investigate infections of the central nervous system, as such cases are usually admitted to hospital at an early stage. Investigation usually begins with a general examination of the cerebrospinal fluid to exclude pyogenic and tuberculous meningitis. In cases of lymphocytic meningitis there are various valuable serological tests, including those for lymphocytic choriomeningitis, canicola fever, and mumps infection.

Skin Infections

Bacteriological examination may be of value in some skin diseases. In unusual or intractable pyogenic conditions, a culture and sensitivity test, together with a search for the focus of infection, may be useful. The examination of scales or hair from suspected cases of ringworm may help in prognosis and may indicate a possible animal source of infection. Swabs from suspected cases of anthrax, especially among those not known to handle dangerous materials, may be of vital importance in securing early treatment.

Other Activities of the P.H.L.S.

Supply of Sera, Vaccines, etc.—The service takes no part in the supply of therapeutic sera, but holds stocks of certain prophylactic and diagnostic agents. It supplies vaccine lymph direct to the practitioner, and diphtheria prophylactics indirectly through the local health departments. It keeps stocks of scarce prophylactic agents such as typhus vaccine, rabies vaccine, gamma globulin, and anthrax anti-serum, but typhoid, plague, and cholera vaccines are obtained from commercial sources. The laboratory staff will be pleased to advise about immunization procedures, but will not, as a rule, carry out inoculations. Skin-testing reagents, including Frei antigen, brucellin, Trichinella, and hydatid antigens, are available for suitable cases.

Field Investigations.—The service is constantly engaged in investigations into the source and mode of spread of infectious diseases, and in field trials of prophylactic agents. Although many of these activities are carried out in co-operation with the public health authorities, much help is obtained from general practitioners, and some schemes would be impracticable without their participation. Many practitioners are taking part in the scheme for the early diagnosis of influenza and others are collaborating in trials of whooping-cough vaccines. Those who encounter new or unusual types of infectious disease will find that the laboratory staff are anxious to assist in their investigations.

The general practitioner has direct access to the public health laboratory for the submission of specimens and for advice on the prevention and control of infections and on general problems of immunity. He will find many opportunities for useful collaboration with the laboratory, both in the solution of day-to-day problems and in the acquisition of new knowledge.

Next article on Clinical Pathology.—"Dispatch of Specimens," by Dr. Martin Hynes.

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

EUROPEAN HAEMATOLOGY CONGRESS

[FROM A SPECIAL CORRESPONDENT]

The Fourth Congress of the European Society of Haematology was held in Amsterdam from September 8 to 12. Over 500 members and about 250 guests attended from at least 28 countries.

Six main topics were chosen for discussion and over a hundred papers were presented. Immuno-haematology was dealt with first, the chief contributions being by J. V. Dacie (London), J. J. van Loghem, jun. (Amsterdam), C. Gasser (Zurich), J. F. Ackroyd (London), S. Moeschlin (Zurich), W. Dameshek (Boston), and M. M. Hargraves (Rochester, Minn.). Amongst the subjects discussed were the antibody patterns and clinical syndromes of acquired haemolytic anaemia, the mechanism of drug-induced and idiopathic purpura and granulocytopenia, and the significance of the L.E. cell. Further information was available on the characterization of the antibodies of acquired haemolytic anaemia, but there was nothing new concerning its aetiology or treatment. Recent work on anti-platelet and anti-leucocyte agglutinins indicates that many cases of drug-induced or idiopathic thrombocytopenia or granulocytopenia may have a pathogenesis comparable to that of acquired haemolytic anaemia. Dr. Dameshek in his usual challenging style went so far as to suggest that Henoch-Schönlein purpura was an immunovascular disease.

Barbiturates and Porphyrinuria

The metabolism of haemoglobin and erythropoiesis were the next main topics. The chief contributions were by H. Bénard (Paris), C. Rimington (London), and J. Waldenström (Malmö). By the use of tracer techniques in particular it has been shown that haemoglobin synthesis continues in non-nucleated erythrocytes, particularly during active blood regeneration. On the purely chemical side Professor Rimington presented new work on the mechanism of formation of porphyrins from porphobilinogen. Barbiturates can cause porphyrinuria in experimental animals, and there appears to be evidence that this can happen in man also, particularly where latent porphyria exists. The same may be true of lead intoxication.

The metabolism of iron and iron-deficiency anaemia were next discussed, and the remarkable elucidation of the metabolic pathways that can be obtained by using ^{59}Fe was clearly demonstrated. C. V. Moore (St. Louis) made a plea for the abandonment of the title idiopathic as a description for certain iron-deficiency anaemias: in his view iron-deficiency was always due to blood loss, to deficiency of iron in the diet, or to failure to absorb it. Haemochromatosis and the siderosis due to transfusions were next considered, and finally vitamin B_{12} and the megaloblastic anaemias. The main papers were given by L. Heilmeyer (Freiburg) and C. C. Ungley (Newcastle).

Treatment of Acute Leukaemia

On the third day of the Congress three main topics were dealt with: acute leukaemia, lymph-node puncture, and the platelets. W. Dameshek (Boston) reviewed the treatment of acute leukaemia; in his experience the most promising therapy was a combination of A.C.T.H. and aminopterin. With this regime he had had 25 successive remissions lasting from four weeks to two years in cases of acute lymphocytic leukaemia in children and young adults. Some patients had had up to four remissions. The principal papers on lymph-node puncture and blood platelets were given by A. Pavlovsky (Buenos Aires) and S. van Creveld (Amsterdam), respectively.

The last topic discussed was that of blood coagulation. R. G. Macfarlane (Oxford) described his conception of the formation of blood thromboplastin, the main point being that the so-called accelerators are thought to be participants in the reaction which produces thromboplastin and not accelerators of the reaction of thromboplastin with

prothrombin. P. Owren (Oslo) reiterated his well-known views and nomenclature. F. Koller (Zurich), however, appeared to accept the Oxford view in large part; using a modified thromboplastin generation test, he had been able to demonstrate the presence of yet another coagulation factor, Factor 10. N. Rosenthal (New York) put forward evidence for a new (third) variety of haemophilia. The final paper was given by P. Nolf (Brussels), whose work on blood clotting, carried out many years ago, antedated to some extent some of the new advances. There seemed to be no new important advances in the treatment of haemophilia.

Where Congresses Sometimes Fail

Dr. S. I. de Vries, President of the Dutch Haematological Society, and his Secretary, Dr. M. C. Verloop, and the other members of the organizing committee are deservedly to be congratulated on the organization of the Congress. Without doubt it was a success, both socially and scientifically; it was probably at least as successful as any that have been held. However, a few reflections and minor criticisms are perhaps permissible. As in most congresses, there were too many papers, and not all the work presented was new. There was too little public discussion: as this was held after an hour or an hour and a half of papers there is little wonder that saturation point had been reached. Finally, the technique of presenting papers could and should be improved: some papers were excellently given, others by no means so well. Particularly before an audience of many nationalities there can be no excuse for a rapid oration illustrated by most complicated small-scale diagrams and tables. It is essential to present simple diagrams and abbreviated tables made with type of the largest possible size and to emphasize the main points of a diagram or table with a pointer. When this was done even those with an indifferent knowledge of German or French (or English) were able to understand what the speaker was talking about. All in all, though, it was a very enjoyable congress. The Dutch are surely a most generous and genial people.

VASCULAR SURGERY

[FROM A SPECIAL CORRESPONDENT]

The second congress of the International Society of Angiology was held at the Novo Hospital Escolar in Lisbon from September 18 to 20. The opening session dealt with aneurysms. Professor E. HOLMAN (San Francisco) discussed the care of traumatic aneurysms and arterial injuries. In the second world war popliteal arterial ligation had been followed by gangrene in 70% of cases. Arteriovenous fistulae had been treated by quadruple ligation and only exceptionally by restoration of continuity. Most of the patients were afterwards found to suffer from arterial or venous insufficiency.

The Lessons of Korea

During the Korean war the picture had completely changed, and restoration of continuity was now the rule. One surgeon reported 82 cases of arteriovenous fistulae with successful reconstruction as against only three failures, and similar results were reported from other Korean war hospitals. The reasons for the spectacular improvements were: better control of infection by antibiotics; improved technique in handling vessels; availability of blood and blood substitutes in unlimited quantities; training of surgeons in vascular techniques; evacuation of wounded soldiers by helicopters; and availability of homografts stored in Gross's solution at 4°C.

Professor Holman stressed three important rules in the modern treatment of vascular injuries. The first is that the main artery should always be controlled as a preliminary measure, if necessary through a separate incision, when dealing with any wound in which a major arterial injury is suspected. The second is the importance of maintaining

the blood pressure at normal levels by repeated blood transfusions following operations of arterial repair. Finally and most important, "Do not wait. Prompt intervention and reconstruction is the rule." Professor Holman's lessons from the Korean war, and the figures which he quoted, many of which have not yet been published, were of absorbing interest. The emphasis on large transfusions is a fruit of the work of the Medical Research Council investigators, R. T. Grant and E. R. G. Reeve, and of Simeone and his colleagues in the U.S. Army, which showed that "shock" in the old sense is rare or non-existent, and that its symptoms are really due to unrecognized or underestimated blood loss. The American Army system in Korea of training large numbers of young surgeons in the methods of vascular repair has paid handsomely in the good figures achieved, but perhaps the most startling lesson lies in the last principle that Professor Holman enunciated. Prompt intervention in arterial injuries is quite contrary to the conservatism which was the best practice under the circumstances of the two world wars.

Mr. D. J. ROBERTSON (London) described a series of 32 patients with congenital arteriovenous fistulae of the limbs. In 18 the disease was of a localized type and often suitable for surgical treatment, but in the remaining 14 it was diffuse and less easily treated, amputation being necessary in some cases. He warned against the bad and often disastrous effects of proximal arterial ligation. Dr. A. BLAKEMORE (New York) described the results of treating aneurysms by excision and restoration of continuity with a tube of Vinyon-N plastic cloth, a method which showed promise. Sections obtained later showed that the tube became lined with tissues resembling intima. Prostheses such as these, should they prove successful on more protracted trial, would offer obvious advantages over stored homografts.

Dr. F. GERBODE (San Francisco) discussed the uses of blood-vessel grafts in repair of major vessels. Stored arterial homografts were best reserved for use in older patients, as little was yet known about the long-term changes which might occur in the grafts. In young patients it was best to use vein autografts whenever possible.

Surgery of the Mitral Valve

Professor E. HOLMAN, in opening the discussion, said that too little credit had been given to Sir HENRY SOUTAR, of London, for his pioneer operation on the mitral valve many years ago.¹ Dr. E. S. HURWITT (New York) showed a film illustrating the action of the mitral valve in the dog. The sphincter-like action of the annulus was clearly responsible for a great proportion of the closure. The slackening of the chordae tendineae during closure and their pulling effect on the edges of the cusps during opening were beautifully demonstrated.

Dr. F. GERBODE (San Francisco) discussed the indications for surgery for mitral stenosis. The majority of cases never required operation, but during the third or fourth decade of life deterioration due to myocardial changes, shortening of the chordae, or narrowing of the orifice might make operation necessary. It should never be done prophylactically. In those patients in whom disability had necessitated operation the mortality rate had been ten in the first hundred. With greater experience this figure became lower. The main indication for operation was progressive disability in the absence of major physiological defects of other valves. Age itself was no longer a contraindication. Originally the limits were set between 20 and 40, but recently older patients had been treated with success. Previous embolism or auricular fibrillation were not contraindications. Nor was a mild degree of mitral regurgitation, but this was often difficult to diagnose, and in many cases no pre-operative signs existed. Patients with predominant regurgitation were unsuitable for valvotomy. Clinical examinations and plain radiology were the most important elements in diagnosis. Cardiac catheterization and angiography were necessary only in a minority of cases.

A number of surgeons from European centres reported results and described indications in general agreement with

Dr. Gerbode. Professor A. M. DOGLIOTTI, of Turin, reported a mortality of less than 7% in 150 cases. In the last 50 cases only one death had occurred. His indications for operation included some patients with less severe disability than those in Dr. Gerbode's series, and in general it was evident that each surgeon's mortality figures depended upon the degree of illness of the patients included. Dr. C. P. BAILEY (Philadelphia) had a very large experience of this type of surgery and advocated operation in many milder types of disease, including those in Classes I and II in the American Heart Association's classification. Dr. D. E. HARKEN (Boston) had an experience of 500 operations. In favourable cases his mortality rate was less than 3%, and he discussed methods of reducing post-operative morbidity and complications.

Late Results

Mr. R. C. BROCK (London) spoke of the late results of mitral valvotomy. He described the morbid anatomy of the diseased valve. It was possible for digital dilatation to enlarge the central opening to give a 1 to 2 cm. gap. This would produce a temporary relief of symptoms, but recurrence would take place unless the vital "critical areas" of adhesion which he described were broken down. The limit to improvement of function was set by the degree of deformity and fibrosis of the valve. If this was severe the valve would never work again even if the adhesions were cut. To make certain that a proper valvotomy had been done it was necessary to feel the papillary muscles and the chordae tendineae with the finger. In order to make it possible for long-term results to be studied scientifically and for different series to be compared an exact record of the state of the valve before and after valvotomy should be made. Four grades were suggested for this. Although it was really too early to consider late results on a detailed statistical basis, Mr. Brock gave some interesting general figures. Of 135 cases operated on personally and available for review one to five years after the operation, three had died and three had deteriorated during the time of observation.

Mitral Regurgitation

The treatment of patients in whom mitral regurgitation predominated over stenosis was a far more difficult problem. Dr. C. P. BAILEY described his experiences. The first operation tried was a modification of the Murray sling, in which a sling of pericardium was passed across the mitral orifice to act as a sort of flap valve. The mortality rate (38% in 57 cases) was prohibitive and the operation had to be given up. Attempts to improve the efficiency of the valve by placing a purse-string around the chordae proved fatal in two patients. His present operation consisted in opening up the adherent part of the valve orifice as in the stenotic cases and suturing the gaping inefficient part with a strip of pericardium passed by a special method. He had done 86 of these operations with a mortality of 27%. The improvement in the survivors was as good as in the cases operated on for stenosis. Dr. P. CHALNOT (Nancy) showed a film of experimental operations in dogs, in which a plastic ball was placed on the ventricular wall so that it helped to occlude the mitral orifice during systole. The animals survived provided the prosthesis was accurately placed. Dr. D. E. HARKEN had used this type of operation in man, but it had been disastrous. A sphere was the wrong shape; if a cylinder was used success could be achieved, and 25 patients had been treated with only three deaths. He showed a film of the operation.

The congress ended with papers on general subjects. Dr. H. B. SHUMACKER (Indianapolis) described a method of closing inter-atrial septal defects by invagination of a pocket of pericardium which had been used with benefit in an 11-year-old boy. Attempts to close interventricular defects had failed, largely because the patients were in extremis before operation. Mr. D. J. Robertson (for Mr. J. B. KINMONTH, London) described the lymphatic circulation in patients with lymphoedema. Outlining lymphatics at operation with dyes had shown that the lymph trunks were dilated, tortuous, and incompetent, resembling varicose veins. There

was no evidence that obstruction existed. Benefit could be obtained from lymphangiectomy. Dr. E. J. WYLIE (San Francisco) described his experiences with thromboendarterectomy in 50 patients with isolated areas of arterial thrombosis between the level of the lower abdominal aorta and the popliteal artery. Sixteen had re-clotted. There were nine deaths. These figures did not dispel the feeling of disfavour with which the operation is regarded in England, and it was interesting to learn that Professor dos Santos, who originated it, was now pessimistic about its results.

REFERENCE

¹ *British Medical Journal*, 1925, 2, 603.

THE NEW ACADEMIC YEAR

MINISTER OF HEALTH AT KING'S COLLEGE HOSPITAL

The opening of the 124th session at King's College Hospital Medical School, Denmark Hill, took place on October 2, Sir WILLIAM GILLIATT presiding. The Minister of Health, Mr. Iain Macleod, attended and presented scholarships and prizes to 24 recipients. THE DEAN (Dr. Vernon Hall) said that the Minister had agreed that the medical school needed about 150 beds for teaching purposes additional to those available in the King's College Hospital group, and that these beds should be under the clinical control of the school's teaching staff. Agreement in principle had also been reached between the regional hospital board, the Camberwell Hospitals Management Committee, and the medical school for the use of beds in Dulwich Hospital for this purpose. But the Ministry had still to decide who was to meet the not inconsiderable cost of these beds. Moreover, this scheme of association, while welcome, was not, in the opinion of their teachers, the final solution. Every teaching hospital needed a large medical staff in the interests of undergraduate education, and only by having more beds under its control could the board of governors make the fullest use of its medical staff and thereby reduce the cost of patients' treatment. Further, until the parent hospital could provide more beds the school could not proceed with its plans for the provision of professorial units in some of the clinical teaching departments.

The State and the Teaching Hospitals

MR. IAIN MACLEOD began his address by quoting passages from the speeches made by Sir Lionel Whitby and Sir Richard Livingstone at the recent First World Conference on Medical Education, and he took as his theme "the philosophy of the first-rate" as expounded by the latter speaker.¹ The Minister said that, although he was not conversant with the content of the medical curriculum nor with the techniques of medical education, he was very much concerned with what industry would call the "end product," and, for good or ill, he was by far the largest employer of those who emerged from the schools. Five years after the inception of the National Health Service might be a good time to consider the relationship between the university, the teaching hospital, and the Ministry. Medical schools were now entirely free within the university sphere to determine the method and content of medical education in the same way as the other schools of universities. In accordance with the well-established principle that the State should not interfere with university education, Exchequer assistance was given through the Universities Grants Committee, with which the universities dealt direct. Mr. Macleod added that many people felt that the hospital system could be improved by the general application of the block system of grants. That was a point to be considered by the Guillebaud Committee.

The Minister went on to ask whether the number of students entering the medical profession was adequate to the needs of the community. The figures for entrants in

¹ *British Medical Journal*, August 29, p. 454.

1951-2 represented no very great increase on those for 1938-9. This was not due to any lack of demand for such facilities. The reason was partly that there had been no recommendation for an increase, and partly that the medical schools felt that they were not therefore called upon to incur risks to their standards which would be involved by a large increase in numbers. It was a very difficult balance to strike, because, while too few doctors were a threat to the health standards of the community, too many doctors might well constitute a threat to the standard of medical education itself. It did not appear from the figures that the introduction of the National Health Service had in any way prejudiced entry into the medical profession, although it had been necessary from time to time to take some steps in order to secure what seemed to the Ministry their correct distribution. This had been done so far as general practitioners were concerned through the Medical Practices Committee. An attempt had also been made, not wholly successfully, to meet the difficult position that had arisen in the senior registrar group, upon the solution of which depended the future of a stable and established consultant and specialist service.

They must not lose sight, Mr. Macleod continued, of the dual function of the teaching hospitals—namely, to provide hospital service and also to provide clinical facilities for education. There might be a real risk in the demand by the school for clinical facilities for specialisms and research, to the detriment not only of the hospital service but of the normal clinical facilities for undergraduate medical education. It was of great importance that the Medical Research Council, in collaboration with the Ministry and other interested bodies, had taken steps to put clinical research on a proper footing, with special financial arrangements by the Treasury under the aegis of the new clinical research boards. Thus it was hoped that the partnership between the schools and the National Health Service would present no difficulties in the future.

Although owing to the introduction of the National Health Service the hospitals were freer from financial worries, there were those who regretted that with the substitution of the Ministry for the board of governors as the final arbiter in so many matters of policy some intimate relationship had been lost. Mr. Macleod thought that it was possible to overestimate this, and he liked to think that in this respect matters were getting happier all the time. In the same way, in another field, that of general practice, the picture presented in the valuable report on the survey recently carried out by the British Medical Association, although not unfavourable, was, Mr. Macleod believed, less happy than the picture as it would be now (the survey was made in 1951). The situation was getting steadily better.

A vote of thanks to the Minister was proposed by Sir CECIL WAKELEY, P.R.C.S., and seconded by Dr. F. S. COOKSEY.

ROYAL FREE HOSPITAL SCHOOL OF MEDICINE

The prize-giving at the Royal Free Hospital School of Medicine took place in the Beveridge Hall of the Senate House of the University of London on October 2. The DEAN (Dr. Katharine Lloyd-Williams), who presided, referred in her report to the recent First World Conference on Medical Education. She had found it most stimulating and interesting, but even six years' training could do no more than lay the foundations on which true medical education was based. She then referred to distinctions obtained by Royal Free students, and paid a tribute to the staff. There then followed the prize-giving.

The Student's Debt to Society

Miss G. E. M. JEBB, former Principal of Bedford College, gave a brief inaugural address. She stated that she knew nothing about medicine nor about science, and what she had to say referred to students in general. Anyone venturing upon a university career found himself a member of a large group or society with a certain status and privilege, but also

with special duties and problems. All students in every grade and branch of learning had one thing in common, that they were in a position of economic dependence. This was a thorny subject. Economists divided society into producers and consumers, and the university student was in the rather embarrassing position of remaining a consumer at a time when most others of his age were already pulling their economic weight as producers. For some time he must depend on the activities of others to sustain him.

Another way of looking at the situation, Miss Jebb went on, was that the student represented an economic investment; he was working for a future, undergoing in many cases a long and severe training, with the expectation of becoming a very effective producer for the community. At present some 30% of students were wholly supported either by their parents or from private funds; the remaining 70% were to a greater or less extent supported from public funds, State or local. While young persons of the present day were most reluctant to be a burden on their parents, there was not the same sensitiveness with regard to the national exchequer, and in this as in other directions people looked upon public funds as an unlimited source from which to draw. Students were in a sense highly privileged persons, and the higher their privilege the more need was there to recognize their obligations. The larger the expansion of the Welfare State, the greater the need for a rising standard of what she called economic morality. The student would be a worthy "investment" if he set out upon his career conscious of his obligations and determined to make an ample return to the community in the service for which he had been trained.

A vote of thanks to Miss Jebb was accorded on the motion of Dr. H. E. DIMSDALE, seconded by Dr. L. M. DICKSON.

Correspondence

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

Orthopaedic Care in Poliomyelitis

SIR,—We have read with some dismay a document just circulated by the Welsh Regional Hospital Board to every consultant asking "to make sure that the arrangements for the admission and treatment of cases of poliomyelitis in their regions are up-to-date and efficient," and reporting a meeting several weeks ago of 35 physicians, otolaryngologists, and anaesthetists, together with representatives of the Welsh Board of Health, the regional hospital board, and a number of co-opted members, which recommended that teams should be set up throughout Wales for the treatment of acute poliomyelitis, comprising a physician, E.N.T. surgeon, anaesthetist, neurologist, and physiotherapist.

Throughout the whole of this lengthy document and its attached memoranda and reports, and throughout the whole of its recommendations, there is never one single mention of the orthopaedic surgeon, who, of course, has the responsibility of looking after these patients for the rest of their lives and cannot do it well unless he starts from the beginning. No orthopaedic surgeon was invited to attend the conference. There was no proposal to include an orthopaedic surgeon in any of the teams—only a physiotherapist, who, bless her heart, would not get far among the otolaryngologists and anaesthetists who are to treat poliomyelitis. No view was sought from any orthopaedic surgeon; there was only a report from Dr. Ritchie Russell's medical registrar.

Orthopaedic surgeons, who are necessarily tolerant, have applauded the recent enthusiasm of some physicians and neurologists in the management of poliomyelitis, especially since the recent epidemic in Denmark, which showed so high an incidence of bulbar palsy (though, let it be noted,

a high incidence also of limb paralysis), even when recent observations and writings have sometimes tended to suggest that only physicians or neurologists are really capable of treating acute poliomyelitis. But when enthusiasm becomes so fanatical that every consultant in one region of the Ministry of Health, and indeed in the whole of one country—Wales—is advised that no orthopaedic surgeon need be consulted on the advisory committee, or appointed to any of the special teams, and that a physiotherapist will suffice to aid the neurologists, otolaryngologists, and anaesthetists in the treatment of poliomyelitis, it is time to remind ourselves that when this was last done, ten or twenty years ago, we had great disasters and many horrible deformities, which could have been prevented but were relieved only after years of surgical treatment.

The British Orthopaedic Association recognizes at once the vital and imperative part that physicians, neurologists, and other specialists must play in the treatment of poliomyelitis in its acute stage. It knows too that the lifelong treatment of patients with residual paralysis succeeds best when orthopaedic management starts early, because only then is the serious and insidious deforming potentiality of poliomyelitis controlled. It asks only—and not for reasons of courtesy but only in the interests of good preventive treatment—that consultation and collaboration should begin from the beginning.—I am, etc.,

London, W.C.2.

REGINALD WATSON-JONES,
President, British Orthopaedic Association.

Poliomyelitis and Inoculation

SIR,—In your annotation (*Journal*, September 19, p. 669) no direct reference was made to suspended whooping-cough vaccine. Dr. James Grant (*Journal*, August 15, p. 394) describes the introduction of the subcutaneous injection of this substance after an epidemic of poliomyelitis had ceased. Following consultation with the manufacturers and local health authorities, I have used the suspended pertussis vaccine throughout the past summer. In view of the guarded advice given by the Ministry, I would be glad of the opinions of others on the use of this latest method during epidemics.

It would also be of interest to know if there has been any correlation between painful lesions, elsewhere than in the pertussis-injected muscles, and paralysis. From the practical point of view such lesions could not be avoided in persons exposed to and infected with poliomyelitis. Yet much could be achieved if the precepts of Brehme and Leuterer were adopted. They advocate heavy sedation in the pre-paralytic stage to prevent activity of the anterior horn cells. The following recently observed case seems to support their argument. A child of 7 years of age was confined to bed for five days with a fever associated with slight meningism. On the sixth day there was fibrositis of the left shoulder muscles, and two days later an abductor paralysis developed. This child had lain on her right side in bed, holding a comic in the left hand, for quite long periods every day. Only heavy sedation would have prevented the child from this type of activity.

In the interests of clinical research in general practice and the need for improved prophylaxis, certain problems require urgent consideration. First, the general practitioner must have an agreed set of criteria upon which to base a decision to treat a suspect case with full sedation while under observation at home. Secondly, some guidance is needed as to the type of drugs to use and the duration and mode of administration. It would be of help to the general practitioner if some guidance were given on the type of case which should have hospital treatment. For instance, should a patient exhibiting localized muscle pains, together with the other criteria, be sent to hospital?

As a basis for discussion I would suggest that the following criteria would justify a presumptive diagnosis of pre-paralytic poliomyelitis. These symptoms are based on recent experience of a number of cases which were not sent to hospital. It is not considered necessary to submit this

type of case to lumbar puncture. (1) Fever with meningism as evinced by inability to touch the knee with the forehead. (2) Absence of diagnostic signs or symptoms of any other disease after a period of, say, six days has elapsed. That is to say, if at the onset there is no otitis media, classical tonsillitis, or respiratory infection, the case should be considered as pre-paralytic poliomyelitis in conjunction with the other criteria. (3) Headache. (4) Occurrence during the summer and autumn, especially when paralytic cases have been notified. (5) Failure to respond to antibiotics given as a therapeutic test. (6) The occurrence of localized persistent muscle pain, following the muscle ache which is present in the neck and limbs at the onset.

It would, in my opinion, be a helpful research if such cases were notified at the end of six days' observation. In this way some cases due to other diagnosable conditions would be eliminated.—I am, etc.,

Hornchurch, Essex.

I. H. J. BOURNE.

REFERENCE
1 *Lancet*, 1953, 1, 700.

Cancer and the Public

SIR,—The Ministry of Health has sent a circular letter to all local health authorities on the subject of health education in relation to cancer (see *Journal*, October 3, p. 783). This action by the Ministry is an extremely serious matter for every family doctor in the kingdom.

In the first place, cancer is not a matter of health: the province of the M.O.H. is preventive medicine, and cancer cannot be prevented by public health measures. Cancer is the province of the family doctor, and I (for one) am not prepared to share my responsibility with a committee presided over by the M.O.H. The circular letter from the Ministry is the thin end of a very dangerous wedge. In the second place, it is extremely disturbing that the Ministry should have acted without any regard at all to the fact that half the family doctors who replied to a recent questionnaire made it clear that they are not in favour of public cancer education (*Journal*, July 18, p. 148). In the third place, it is only about two years ago that the Marie Curie Memorial Foundation was allowed to question the district nurses about our cancer patients without our knowledge, and very damaging statements were made and published without our being given any opportunity to refute them. Once bitten, twice shy.

Fourthly, I see no reason at all why the Ministry could not wait until the results of the present experiments in cancer education can be studied. I believe there are three different experiments in operation at the moment—in Manchester, in Leeds, and in York. I am sure that the only safe course is for every family doctor to make it quite clear now that he will have nothing to do with the Ministry's schemes until all this research has been completed and the results examined.—I am, etc.,

Wetherby, Yorks.

R. L. KITCHING.

Reduction of Post-operative Pain

SIR,—The letter from Mr. J. B. Oldham (*Journal*, September 5, p. 570) is a timely warning that the new long-acting local analgesic agents must be used with more circumspection than their aqueous counterparts; as in the case of alcohol, phenol, and "proctocaine" their injection into the paravertebral region may very occasionally be followed by paraplegia or other undesirable sequelae, apparently as a result of tracking along the nerve sheaths. In the case of "efocaine," I believe that the neurological lesions are more likely to be due to the 78% propylene glycol solvent, which is strongly hypertonic, than to the anaesthetic base. I would suggest that its use in this area should be confined to emergencies such as arterial occlusion or intolerable pain, and that its injection should be preceded by a preliminary dose of aqueous local analgesic which would serve to indicate or exclude any misplacement of the needle, and incidentally supply some fluid to counteract the osmotic

well encouraged by the Army authorities. One commanding officer put the local bazaar out of bounds to troops who had not been inoculated, on the ground that there was typhoid in the bazaar and only men protected by the vaccine could go there safely.

Later, improvements in standardization, and perhaps the use of strains that made more even suspensions than the earlier ones, which were carried out in the Royal Army Medical College, eliminated most of these troubles, and perhaps if more work had been done in the early days on prevention of reaction the general adoption of the vaccine would have been quicker. But after-wit is a very cheap commodity.—I am, etc.,

L. W. HARRISON.

London, S.W.1.

Industrial Health and the Universities

SIR.—In case your leading article, entitled "Industrial Health and the Universities" (*Journal*, August 29, p. 480), should inadvertently give the impression that the future, financial or otherwise, of the Newcastle Department of industrial Health is in question, we feel that we should place the following facts before you.

When the Newcastle-upon-Tyne Division of the University of Durham accepted a grant from the Nuffield Foundation with which to found a department of industrial health, it had in mind a department which would interest itself primarily in work upon practical local problems within the field of industrial health, rather than a department which would promote either additional teaching or industrial health services. All the money spent in the first year of its work came from the Nuffield grant. The grant from the Nuffield Foundation is a diminishing one, and the expense of running the department has risen, so that in the year 1952-3 it cost eight times as much as it did in its first year. Of this sum, university money met 63%, industrial sources 23%, and the Nuffield grant covered the remaining 14%.

More than half the academic staff of the department hold permanent appointments. Of the remainder, one holds a three-year contract from an outside source, and three hold annually renewable posts, two of which are also financed by outside money. For the rest of this quinquennium the department will, like all the other departments in the Medical School, have to cut its academic coat according to its cloth. In future quinquennia it may expect to receive its due share of whatever funds are available for the purposes of the Medical School.—We are, etc.,

R. B. GREEN,

Dean of Medicine.

R. C. BROWNE,

Nuffield Professor of Industrial Health.

University of Durham
Medical School,
Newcastle-upon-Tyne.

Sweating in Shock

SIR.—In his answer to the question: "Why do shocked patients sweat?" your expert ("Any Questions?" August 29, p. 520) explains that the sympathetic overactivity which accompanies shock gives rise to sweating because the sweat glands are innervated by the sympathetic nervous system. He goes on to describe this involvement of the sweat glands as "teleologically unfortunate." This, Sir, raises a most interesting question. To dub this association as teleologically unfortunate is equivalent to saying to Nature: "You have arranged this wrongly. It would have been better if you had done it in another way." This attitude, surely is a negation of the idea of natural selection. Natural selection should ensure that no teleologically unfortunate arrangement survives (though of course vestigial organs may give trouble before they are finally extinguished); and I feel that any apparent inappropriateness of a natural system should be ascribed to an imperfection in our understanding of it rather than to an imperfection in Nature.

I am often reminded of my ignorance about the cause of sweating during anaesthesia—when it is often apparently unassociated with vasoconstriction—and I feel that we must try to find some more satisfying explanation.—I am, etc.,

RONALD WOOLMER.

Bristol.

POINTS FROM LETTERS

Treatment of Acute Malaria

Dr. I. GORDON CAMERON (Nairobi) writes: The *Journal* of August 1 has just come to hand, with the illuminating letters from Sir Philip Manson-Bahr (p. 284) and Dr. R. Y. Taylor (p. 285) on the prophylaxis and treatment of acute malaria with special mention of pyrimethamine ("daraprim"). May I say how heartily I agree with both writers. . . . Recently I described in the *East African Medical Journal* (1953, 30, 255) a case in which the patient was treated with four times the manufacturers' recommended dose of pyrimethamine and relapsed within 14 days, almost dying of malaria. My stand-by for the past 27 years has been quinine, and it mattered not whether the attacking plasmodium was benign, malignant, or quartan—the patient recovered. One had relapses—no matter; but one had no deaths.

Poliomyelitis and Wrapped Food

Dr. H. DALE BECKETT (Bridgend) writes: It is striking that in those countries where food hygiene is considered important the incidence of poliomyelitis is greatest. Scandinavia and the United States have for many years been subject to the scourge, and for the past few years we, who have recently taken to buying more wrapped bread than ever before, suffer badly too. The old argument that used to be heard against the policy of pasteurizing milk, that a number of subinfective doses may produce immunity, must again be considered.

The Anxiety State

Dr. R. MACDONALD LADELL (Scarborough) writes: It was a pleasure to see the anxiety state so ably dealt with by Dr. E. A. Bennet (*Journal*, September 5, p. 554). It seems to me, however, that Dr. Bennet could have gone further in his task of acting as liaison between the expert and the G.P. The conscientious practitioner may be left somewhat frustrated by the careful and circuitous approach advocated. I believe that the approach can be much more direct so that, with experience, the cases in need of specific reassurance and a word of advice can be detected and dealt with in a matter of minutes. The adolescent youth may complain of heart or lungs, but if the doctor goes straight to the point he will find that the actual worry concerns the possible physical and mental effect of "losses." When masturbation has become obsessive it is always because it has become linked with anxiety. It is then used for comfort as a child sucks a dummy. The youth who has been fighting a losing battle because he believes he is over-sexed and that he has lost his will-power is able to break the vicious circle once the subject has been rescued from the emotional bias which commonly obscures it. The adolescent girl who suffers and resents the domination of her parents is apt to be regressive in the same way, and will be correspondingly grateful if her "secret sin" is dealt with on a matter-of-fact plane. . . . Dr. Bennet would seem to suggest that the phobias can be classed with other anxiety states as regards first-aid treatment. I do not think this is so, although some of the causes of anxiety I have mentioned may be intensifying the phobia. A phobia is symbolic, and, as Dr. Bennet says, the reason is hidden in the unconscious. Such patients should therefore be referred to the expert.

Experimental Hypnosis

Dr. G. AMBROSE (London, W.1) writes: Professor A. Kennedy in his latest review of hypnosis (*Journal*, September 5, p. 546) uncovers some pertinent points confronting hypnotherapy in this country. Students can find no facilities for acquiring the art of hypnosis. Doctors mastering the technique find little scope for their knowledge, for sooner or later they may come up against ignorance and prejudice from their fellow practitioners. However, the solution seems simple. Teach the subject in medical schools, open clinics staffed by competent medical hypnotherapists, give adequate facilities for research, and produce a learned society attracting the best brains in the country. All this has already been accomplished in America.

Alcohol-induced Pain

Dr. H. PULLAR-STRECKER (Isleworth, Middx.) writes: Alcohol-induced pain in Hodgkin's disease as discussed by Dr. Jan G. de Winter (*Journal*, September 12, p. 604) and other chance observations of the kind may eventually help those engaged in study and prevention of alcoholism to find a physiological means of protecting their patients. There are quite a number of substances causing distaste (or disinclination) for alcohol or a dislike of it. Of these, hydrogen sulphide is particularly interesting (*Brit. J. Addict.*, 1949, 46, 47), since it appears to produce a "natural" distaste for alcohol, in contrast to the enforced dislike produced by tetraethylthiuram disulphide ("antabuse").

Obituary

R. H. CROWLEY, M.D., F.R.C.P.

Early days in the medical branch of the old Board of Education are recalled by the death of Dr. R. H. Crowley, formerly senior medical officer of the Board, at Tewin, Hertfordshire, on September 25 at the age of 84.

Ralph Henry Crowley was born on February 11, 1869, the son of the late Mr. Alfred Crowley, of Croydon, and was educated at Brighton Grammar School and at



(Elliott and Fry, Ltd., London)

Oliver's Mount School, Scarborough. Receiving his medical training at St. Bartholomew's Hospital, he qualified M.R.C.S., L.R.C.P. in 1893, taking the London M.B. in the same year. He proceeded to the M.D. in 1895, was elected a Member of the Royal College of Physicians of London three years later, and became a Fellow in 1930. After qualification he held the appointment of house-surgeon to out-patients at the Hospital for Sick Children, Great Ormond

Street, and later became school medical officer under the Bradford education authority, which post he held until 1909, when he began his long association with the Board of Education. He married Miss Muriel Priestman, of Bradford, in 1902, and had two daughters.

We are indebted to Dr. ROBERT WEAVER for the following appreciation: When Sir George Newman died in 1948 many well-deserved tributes were paid to his work as the first Chief Medical Officer of the Board of Education. The school medical service owed him a very great deal. Behind the scenes in those days the unspectacular work was being done by Dr. (now Dame) Janet Campbell, Dr. Alfred Eichholz, and Dr. Ralph Crowley, and they brought to the task that practical experience of school medical problems and handicapped pupils which Newman lacked. Bradford had appointed a school medical officer as far back as 1893, and this post was held by Crowley when, in June, 1909, he was invited to join the recently established medical branch of the Board of Education. In 1924 he was appointed to the newly created post of senior medical officer of the Board, a position he held until he reached retiring age in 1933.

When the Ministry of Health was established in 1919 Newman became Chief Medical Officer of that Ministry as well as of the Board of Education, but the duties of the former post were so onerous that he had of necessity to leave the school medical service very largely in Crowley's hands. If there was one part of that service which Crowley wished to see developed above all others it was research. He realized what opportunities there were for clinical investigations in the schools and school clinics, and anyone who showed signs of wanting to do such work was sure of his whole-hearted encouragement and support. He had a great deal to do with the original investigations carried out directly on behalf of the Board—inquiries into problems of vision and hearing, mental defect, anthropometric data, and so on. His concern was not entirely with medical problems; he was as interested in the educational as in the physical development of the child, so that there was never any possi-

bility of the school medical service being for him a mere organization for the ascertainment and cataloguing of defects.

Crowley seemed to be the perfect example of a healthy mind in a healthy body. It was impossible to imagine him ever being bored or depressed; his enthusiasms were boyish in their intensity, and to the very last day of his service with the Board he retained that keenness which was so characteristic of him. He always appeared to be much younger than his real age.

There can seldom have been anyone less self-seeking than Crowley. Official honours made no appeal to him, and when he had to make a decision his own interests were never considered. He gained the abiding affection of all who worked under him, for they knew they could trust him implicitly.

LEWIS G. GLOVER, M.D.

Dr. Lewis G. Glover, a former treasurer of the Royal Medical Benevolent Fund, died at his home at Hampstead on September 25 at the age of 85.

Lewis Gladstone Glover was born at Highbury on April 9, 1868, the youngest son of Sir John Glover, a well-known shipowner. He was educated at Highgate School and at St. John's College, Cambridge, gaining an exhibition and graduating B.A. in 1889, with a first-class in the Natural Sciences Tripos. From

Cambridge he went to St. Bartholomew's Hospital and took the degrees of M.B., B.Chir. in 1892, proceeding to the M.D. three years later. After resident appointments at the Royal Hospital for Diseases of the Chest and the Victoria Hospital for Children, he became ophthalmic house-surgeon at St. Bartholomew's and thereafter retained a keen interest in ophthalmology.

He then studied for a further six months at various clinics in Vienna. On his return to this country Glover settled in general practice at Hampstead, in the days when Hampstead General Hospital was staffed by general practitioners, of whom he became one of the most active. In 1898 he joined the late Dr. Ford Anderson in partnership. Glover retired in 1929, after more than thirty happy years of strenuous practice.

Meanwhile he had been a councillor in the Hampstead Borough Council and chairman of its public health committee. He became mayor of the borough in 1936 and was re-elected for a second term of office in the following year. A member of the British Medical Association for some fifty years, he served the Association both at Headquarters and locally with enthusiasm. He acted as one of the secretaries of the Section of Medical Sociology at the Centenary Meeting of the B.M.A. in 1932, and from 1934 to 1938 he was a member of the Central Council. He represented his Division at six Annual Representative Meetings and was chairman of the Division in 1922. He was also treasurer and later vice-president of the Metropolitan Counties Branch. Between the years 1932 and 1951 Glover was a member of a number of central committees, with the charities committee and the medical war relief fund committee heading the list for length of service. He was a foundation member and past president of the Hampstead Medical Society, and for many



years he was honorary treasurer of the Royal Medical Benevolent Fund. In the first world war he was in medical charge of the Artists Rifles Officers Convalescent Hospital at Hampstead. He was devoted to St. Bartholomew's Hospital, of which he was a governor. A devout Christian, for more than half a century he was a pillar of the Lyndhurst Road Congregational Church, and for many years was medical adviser to the London Missionary Society.

Glover was the beau-ideal of the general practitioner. Able, highly qualified, keeping himself up to date and in touch with all the worth-while changes in medical practice, he was kindness itself to his patients, always genial and, while scrupulous in details of treatment and diet, never hurried: his memory is treasured by many old patients. He was an accomplished flautist, delighted in the piano, and in his youth was an enthusiastic rider of the old "penny-farthing" bicycle. He was one of the first doctors in London to use a motor-car, a Darracq of 1903.

In 1897 he married Mildred, the daughter of his uncle, Dr. James Grey Glover, of Highbury, to whom he was devoted. This union of fifty-six years was a most happy one, and there were two children, a daughter (Mrs. Abercromby), who practises as an otolaryngologist in Liverpool, and a son. To them we offer our deep sympathy.—J. A. G.

C. B. GOULDEN, O.B.E., M.D., M.Chir., F.R.C.S. We record with regret the death of Mr. C. B. Goulden at his home at Shepreth, Cambridgeshire, on September 20 at the age of 74. For some years he was surgeon-oculist to the Household of the late Queen Mary.

Charles Bernard Goulden was born on August 20, 1879, the eldest son of the late Mr. H. J. Goulden, a publisher and bookseller of Canterbury. He was educated at St. Edmund's College, Ware, and at Downing College, Cambridge, where he graduated B.A. in 1900. He completed his medical training at the Middlesex Hospital, winning the Freeman Scholarship and the Leopold Hudson Exhibition, and took the degrees of M.B., B.Chir. in 1904, in which year he also obtained the diploma of F.R.C.S. He proceeded to the M.Chir. a year later and to the M.D. in 1914.

Goulden was house-surgeon at the Middlesex Hospital in 1903-4 and at Moorfields from 1904 to 1907. His first consultant post, which he held from 1909 to 1919, was as ophthalmic surgeon to Oldham Royal Infirmary. He joined the R.A.M.C. in the first world war, and was on the staff of the ophthalmic centre at Boulogne, where he worked with Sir William Lister, J. F. Cunningham, and M. H. Whiting until he was posted as ophthalmic surgeon in charge of the centre at Rouen. For his services there he was mentioned in dispatches, and in 1919 he was appointed O.B.E.

His exceptional ability was so much appreciated by his colleagues during the war that in 1919 he was elected to the staffs of the London Hospital and Moorfields, and at the latter he became dean of the medical school. From 1937 to 1948 he was surgeon-oculist to Queen Mary's Household, and in the last war he served as ophthalmic consultant to the Ministry of Health. He was also consultant in ophthalmology to the Ministry of Pensions and consultant ophthalmic surgeon to the London Hospital, the Queen Alexandra Military Hospital, Millbank, St. Vincent's Orthopaedic Hospital at Eastcote in Middlesex, and to the Hostel of St. Luke, as well as to Moorfields.

He was president of the Ophthalmological Society of the United Kingdom from 1944 to 1946, president of the section of ophthalmology of the Royal Society of Medicine in 1948-9, and an honorary member of the French and Mexican ophthalmological societies. When the British Medical Association held its Annual Meeting at Dublin in 1933 he served as a vice-president of the Section of Ophthalmology. He was Montgomery Lecturer of the Royal College of Surgeons in Ireland in 1926 and again in 1932, and was an examiner in ophthalmology for the University of London, the Royal College of Surgeons of England, and the London Conjoint Board. His publications included a textbook on refraction, and a translation, with Clare Harris, of Koby's *Slit Lamp Microscopy of the Living Eye*.

Mr. ARTHUR LISTER writes: The above outline of Charles Goulden's career gives an indication of his scholarship, his professional eminence, and the respect in which he was held by those with whom he worked. He was an acute observer, and a first-class clinician and operator. He was always receptive of new ideas, and he was among the first to bring Gonin's detachment operation to England. But his greatest gift was for teaching, in which a combination of enthusiasm, common sense, simplicity of expression and a power to temper criticism with kindness made him perhaps unique in his generation. Two remarks of his are characteristic: a junior colleague had completed an operation successfully, but more by good luck than good management. His bubble of satisfaction was quickly pricked by Goulden saying, "Yes, but you did not do what you mean to do." When the same colleague committed a technical blunder and asked Goulden if he had ever done the same, Goulden replied, "I have done everything I should not have done." His praise of good work was unstinted, and he delighted in technical excellence.

Though not physically robust, Goulden was blessed with untiring energy. Thus, during the last war, when he was past the age of retirement, he carried on at the London and Moorfields, operated weekly at Brentwood, Chase Farm and Goodmayes, and organized the E.M.S. ophthalmic services with undiminished zest and vigour. His enthusiasm and kindness, his sense of humour without malice, and his interest in a wide variety of subjects made him a most charming and lovable companion. He delighted in music, pictures, and cricket, but especially the first, and he said once that music was his chief interest in life but he did ophthalmology for a living. At Boulogne in the first world war the male voice choir which he organized and trained proved a blessed relaxation to his friends and colleagues during those anxious and sombre days.

His retirement, which he deserved and which he could have enjoyed to the full at his home at Shepreth, was marred by serious illness, but his spirit remained undaunted; the night before a serious operation, after giving vent to a slightly unkind remark, he said with a smile, "Fancy saying that on the brink of eternity." Ophthalmologists all over the world who have listened to him owe him much, and the lives of his many friends are the richer because of him. He is survived by his widow, formerly Miss Norah O'Brien, whom he married in 1911.

Dr. H. H. CAVENDISH FULLER, chief medical officer to the former Railway Executive, died in St. Mary's Hospital, Paddington, on September 30 at the age of 66. Hercules Cavendish Fuller was born in 1887 and was educated at Bishop's Stortford and at Edinburgh University, where he graduated M.B., Ch.B. in 1912. He proceeded to the M.D. in 1931. On the outbreak of war in 1914 he entered the R.A.M.C. and served at home and overseas as medical officer attached to the Royal West Kent Regiment until 1917, when he settled in general practice at Malvern. He was then appointed medical officer to Malvern College, a position he held until 1930, and he also became honorary consulting surgeon to Great Malvern Hospital and medical

referee to the Ministry of Pensions for the Malvern area. Dr. Cavendish Fuller was appointed assistant medical officer to the old Great Western Railway in 1930 and in the following year he became chief medical officer. In addition, he was, until war broke out again in 1939, chief clinical assistant to the National Hospital for Diseases of the Heart, clinical assistant to the British Red Cross Clinic for Rheumatism, Peto Place, and medical officer for Channel Islands Airways. During the last war he was responsible for the medical arrangements for the evacuation of children and for air raid casualties at Paddington. He also held the rank of lieutenant-colonel in the Home Guard. In 1948 he was appointed medical adviser to the Railway Executive, while continuing his duties as Western Region medical officer at Paddington, and a year later he became chief medical officer to the Railway Executive. By a sad coincidence his death occurred on the last day of the official existence of the executive.

Medico-Legal

DIABETES AND DRIVING LICENCES

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

S. 5 of the Road Traffic Act, 1930, provides that on application for the grant of a driving licence the applicant must make a declaration in the prescribed form "as to whether or not he is suffering from any such disease or physical disability as may be specified in the form, or any other disease or physical disability which would be likely to cause the driving by him of a motor vehicle, being a vehicle of such a class or description as he would be authorized by the licence to drive, to be a source of danger to the public."

The specified diseases and disabilities are contained in Regulation 5 of the Motor Vehicles (Driving Licences) Regulations, 1950, and are: epilepsy; any form of mental disorder or mental defect as a result of which either the applicant is certified or duly ascertained as subject to be placed under statutory supervision or the applicant's estate is in the hands of a receiver, curator bonis, or judicial factor; liability to sudden attacks of disabling giddiness or fainting; and inability to read at a distance of 25 yards in good daylight six white letters and figures on a black ground of the size and arrangement prescribed for number-plates.

In the case of other disease or disability than the specified diseases and disabilities, s. 5 of the Road Traffic Act provides that the applicant can claim a driving test, and if he passes it his licence is not to be refused solely on the grounds of the disease or disability. If he has previously passed such a test, a further test shall not be required unless it is apparent from his declaration or from information received by the licensing authority that his previous disease or disability has become more acute or that he has developed a new one. In the case of the specified diseases or disabilities, and in the case of other diseases or disabilities likely to cause dangerous driving unless the applicant has claimed and successfully passed a test, the licensing authority is obliged to refuse to grant a driving licence.

Failure by an applicant to disclose that he suffers from diabetes has been made the subject of prosecution for making a false statement in order to obtain a driving licence. Diabetes is not a disease specified under the 1950 regulations. Whether it is a disease which in the words of s. 5 of the Road Traffic Act, 1930, "would be likely to cause the driving by him of a motor vehicle to be a source of danger to the public" is a question on which different views might well be held. The common-sense answer appears to be that, if the sufferer appreciates the risk of hypoglycaemia and has been told by his doctor how to recognize the imminence of attacks and to avoid them by carrying biscuits or sugar or glucose, his diabetes is not likely to be a source of danger. Law and common sense look as if they are in accord.

Vital Statistics

Poliomyelitis

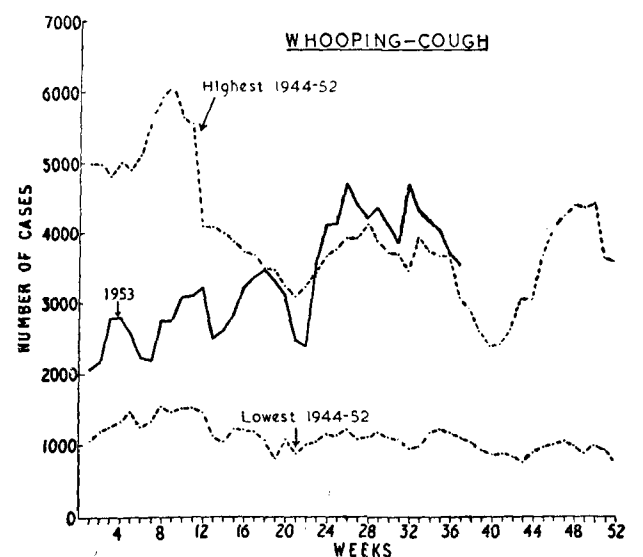
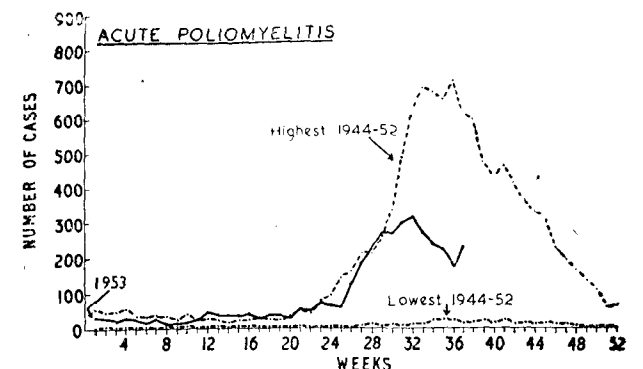
Poliomyelitis notifications (uncorrected) in the week ending September 26 (38th week of the year) were as follows: paralytic, 119 (123); non-paralytic, 99 (104); total, 218 (227). This is a decrease of 9 compared with the previous week, the figures for which are in parentheses. This is small, and the autumn fall in poliomyelitis notifications towards the winter levels is slower than might be hoped for.

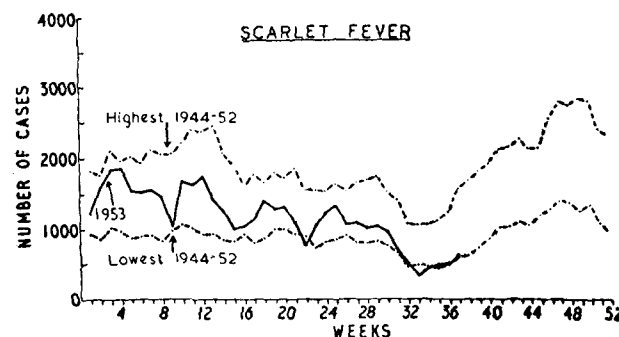
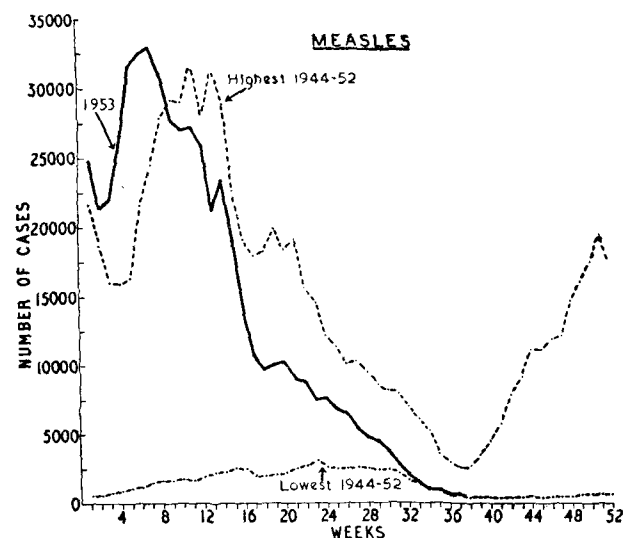
Week Ending September 26

The notifications of infectious diseases in England and Wales during the week included scarlet fever 786, whooping-cough 2,771, diphtheria 29, measles 492, dysentery 263, paratyphoid fever 13, typhoid fever 6.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

The largest variations in the trends of infectious diseases in England and Wales during the week ending September 19 were an increase of 128 in the number of notifications of scarlet fever, from 505 to 633, and a decrease of 153 for whooping-cough, from 3,708 to 3,555.

Only small fluctuations occurred in the local trends of scarlet fever, with the exception of a rise of 34 in Yorkshire West Riding, from 54 to 88. The largest variations in the returns of whooping-cough were a rise of 57 in the number of notifications in Yorkshire West Riding, from 260 to 317, and a fall of 54 in Southampton County, from 162 to 108. 608 cases of measles were notified, 5 more than in the preceding week, and no changes of any size were reported in the local trends. 25 cases of diphtheria, an increase of 6 on the preceding week, were notified. The chief features of the returns for diphtheria were rises in Lancashire from 4 to 7 and in Durham from 0 to 4.

227 cases of acute poliomyelitis were notified during the week. These cases were 31 more for paralytic and 23 more for non-paralytic cases than in the preceding week. The largest returns were Warwickshire 29 (Coventry C.B. 15, Birmingham C.B. 7), London 22 (Lewisham 4, Wandsworth 3, Woolwich 3), Lancashire 20 (Manchester C.B. 6, Liverpool C.B. 4, Preston C.B. 4), Yorkshire West Riding 16 (scattered through 12 administrative areas), Northamptonshire 15 (Kettering M.B. 14), Surrey 13 (Reigate M.B. 4).

The notifications of dysentery have been almost constant during the past month. 202 cases, 2 fewer than in the preceding week, were notified. The largest returns were Lancashire 35 (Farnworth M.B. 12), London 30 (Chelsea 7), Yorkshire West Riding 30 (Bradford C.B. 10), Middlesex 20, and Warwickshire 14 (Birmingham C.B. 12).

73 cases of diarrhoea and enteritis in children aged under 2 were notified in Eire; 57 of these occurred in Dublin C.B.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending September 19 (No. 37) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	25	1	5	1		26	3	9	0	1
Dysentery ..	202	30	94	4	4	100	23	90	4	1
Encephalitis, acute ..	4	0	1	0		2	0	0	0	
Enteric fever:										
Typhoid ..	6	0	0	0		9	0	0	3	2
Paratyphoid ..	8	12	0	0	1 (B)	64	0	2 (B)	0	
Food-poisoning ..	280	88		1		105	13		0	
Infective enteritis or diarrhoea under 2 years ..				14	73				19	47
Measles*	608	16	59	16	24	2,421	240	56	24	62
Meningococcal infection ..	12	1	14		1	26	0	4	0	3
Ophthalmia neonatorum ..	27	5	11	0		29	2	10	1	
Pneumonia†	206	13	109	7		210	13	149	0	
Poliomyelitis, acute:										
Paralytic ..	123	13		14	18	115	6		6	11
Non-paralytic ..	104	9			10	68	5			2
Puerperal fever‡	251	42	11	2		203	33	12	1	
Scarlet fever ..	633	29	153	20	38	701	71	175	10	43
Tuberculosis:										
Respiratory ..			135	22				119	37	
Non-respiratory ..			21	6				24	14	
Whooping-cough ..	3,555	281	313	21	42	1,487	90	95	27	46

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	1	0		0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..		0					0			0
Enteric fever ..	0	0	0	0		1	0		0	
Infective enteritis or diarrhoea under 2 years ..	9	1	0	2	1	7	1	2	2	2
Influenza ..	1	0	0	0	0	2	1		0	0
Measles ..		0	0	0	0		0		0	0
Meningococcal infection ..		1	0				0	1		
Pneumonia ..	116	20	13	8	5	97	13		4	4
Poliomyelitis, acute ..	2	0				6	0			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis:										
Respiratory ..	83	6	9	2	3	86	12	13	5	3
Non-respiratory ..		2	2	0	2		0	0	1	1
Whooping-cough ..	1	0	2	0		1	0		0	0
Deaths 0-1 year ..	174	22	20	6	18	170	19	26	7	15
Deaths (excluding stillbirths) ..	4,236	606	496	85	128	4,091	600	475	93	126
LIVE BIRTHS ..	7,010	1,019	820	233	390	6,907	1,057	829	205	488
STILLBIRTHS ..	171	28	19			176	19	18		

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

Medical News

Sir Godfrey Huggins, C.H., surgeon and administrator, became the first Prime Minister of the Federation of Rhodesia and Nyasaland when, on September 7, he accepted the Governor-General's invitation to form a temporary Ministry. The Ministry has the task of setting up a new government machine and of preparing the initial electoral law under which the Federation's first Assembly will be elected. In addition to the premiership, Sir Godfrey Huggins assumed the portfolios of Finance, External Affairs, and Defence. Sir Godfrey received his medical education at St. Thomas's Hospital.

Middlesex Hospital Medical School Dinner.—The annual dinner of past and present students was held at the Savoy Hotel, London, on October 2, with Mr. C. P. Wilson in the chair. In proposing a toast to the hospital and the school the chairman said that the past year had been an eventful one for the Middlesex, and a year which found them as youthful and progressive as they had ever been. H.M. the Queen had agreed to become their Patron, thereby continuing an unbroken tradition of more than 130 years. He paid a tribute to Canada's generosity in making a gift to Britain of a unit of cobalt-60, the most powerful radioactive substance yet known, for the treatment of malignant disease. The unit had been installed at Mount Vernon Hospital, Northwood. (A description of the unit was given in the *Journal* of March 21, p. 669; it was stated to have cost over £25,000.) Sir Harold Boldero, Dean of the Medical School, spoke of his great faith in the new Institute of Clinical Research, and said that he wished them to realize how it had developed from an ideal to a reality. The board of governors had decided willingly to spend a considerable proportion of the endowment fund on research, and it had been agreed that there should be an institute in which practising physicians and surgeons could undertake research requiring laboratory facilities. The difficulty remained, however, as to where this could be situated. A house to the north of the school had come into the market, but the B.B.C., whose need for accommodation was very real, was interested in it also. He hoped it would not be forgotten that the fact that the hospital had succeeded in becoming the freeholders of the property was due to the B.B.C.'s Director-General of the day, Sir William Haley, who had taken the line that the needs of research at Middlesex Hospital were paramount. Dr. C. G. H. Newman, Senior Broderip Scholar, also replied to the toast, and the health of the chairman was given on the proposition of Professor B. W. Windeyer.

Medical Defence Union.—Presenting the report and accounts (*Journal*, August 29, p. 504) at the annual meeting of the Medical Defence Union last month, the president, Dr. S. Cochrane Shanks, commented on the rising tide of litigation that besets the medical profession. "In the past, a patient might hesitate to sue a voluntary hospital or a doctor who gave his services free." It was not the case now, he said. The three defence unions were at present negotiating with the Ministry on the subject, with the object of defending unwarranted actions together and of settling just claims in amicable agreement. Two committees had been set up by the council of the Union during the last year—one to report on injection routine in operating theatres and the other, in conjunction with the Association of Anaesthetists, on anaesthetic explosions. The first had completed its work.

Hospital Catering.—"It is evident to all, certainly to the hospital population, that there is, here and there, room for improvement in hospital feeding," said Dr. Charles Hill, Parliamentary Under-Secretary to the Ministry of Food, speaking at the School of Hospital Catering in the grounds of St. Pancras Hospital, London, on September 30. Not only was there room for improvement in the more scientific field of calories and proteins and vitamins, but even more in the presentation and serving of food. King Edward's

Hospital Fund for London, in providing the school, Dr. Hill continued, had discovered a valuable and very human way of using some of its resources. He hoped that management committees would take the fullest advantage of the opportunity to send their staffs to the courses of instruction offered. The activities of the school were on display for the many visitors who attended the demonstration. Sample meals for different diets were graded by cost, but had the same nutritional content. In the advisory service department statistics had been worked out for the labour and cost involved in various aspects of hospital catering. This department also offers expert advice on the equipment of kitchens. Refresher courses for the different grades of catering personnel are provided at the school, as well as one-year courses for new entrants into this occupation. Some bursaries are available.

Malaria in Asia.—The permanent elimination of malaria from regions where nearly a quarter of the world's population live was the theme of W.H.O.'s first Asian Conference on Malaria, which ended in Bangkok on September 29. The Conference was attended by delegates from 20 nations. The main conclusion of the Conference, supported by much evidence from local malaria prevention schemes and likely to appeal strongly to governments, is that efficient malaria prevention pays handsome dividends. In one area of Thailand with a population of 280,000 it is estimated that 175,000 man-days of labour were saved after a single year of control work.

Employment of the Severely Disabled.—The Ministry of Labour and National Service has offered local authorities financial help in providing sheltered employment for severely disabled persons. Until now such assistance has been limited to those who are blind. The Ministry offers grants of up to 75% of the capital cost of providing new workshop accommodation and grants towards losses incurred in running them. This should allow the industrial resettlement of any capable of factory work who are not already being assisted either by voluntary agencies or in Remploy factories.

Nuffield Gerontological Research Fellowships.—Because of the high quality of the candidates applying for a Nuffield Research Fellowship for work on the scientific aspects of ageing, the Foundation has decided to award two Fellowships instead of one as originally intended. This has necessitated increasing the sum set aside for this purpose from £25,000 to £51,000. Dr. P. L. Krohn, Reader in Endocrinology at Birmingham University, has been elected to a five-year professorial research fellowship, and Dr. D. A. Hall, Lecturer in Medical Biochemistry at Leeds University, to a three-year research fellowship of less senior status. Dr. Krohn will analyse the causes of ageing. Dr. Hall will study the changes in connective tissue.

Liverpool Medical Institution.—Over 400 members and guests attended the inaugural meeting on October 1, when Mr. J. B. Oldham delivered his presidential address on "The Founders of our Library." Mr. Oldham described the lives of these men who, 180 years ago, started the library from which the Liverpool Medical Institution had arisen, and gave an account of the times and the town in which they lived. Professor N. B. Capon proposed the vote of thanks to the president.

Family Doctor.—The October issue contains articles on "Television for Children" (by C. A. Lejeune), rupture, and infant feeding (by Dr. Ursula Shelley). Other medical subjects discussed are the mechanism of heredity, spectacles, and catarrh. There is the usual batch of medical "Any Questions?" from the lay, ranging from "Can gallstones be dissolved?" to a note on a condition called "Jack Hulbert Jaw." Dr. J. G. Coburn writes on barrier creams and the kitchen sink.

Chair of Surgery at Durham.—Mr. A. G. R. Lowdon, senior lecturer in surgery at Edinburgh, has been appointed to the chair of surgery at Durham University. During the last world war Mr. Lowdon served as a surgeon with the Eighth Army in North Africa and Sicily, and with the British

Liberation Army in Europe. Since the war he has been working with Sir James Learmonth in Edinburgh.

Sir George H. Henderson is retiring this month from his position as Secretary of the Department of Health for Scotland. He will be succeeded by Mr. Harold Ross Smith.

Sir Rudolph Peters, F.R.S., Whitley Professor of Biochemistry at Oxford, received the degree of doctor of science of the University of Cincinnati at a special convocation ceremony there last month.

Distribution of Medical Films.—The British Film Institute and the medical committee of the Scientific Film Association are prepared to make arrangements for the distribution of approved medical films if the owners of the films are unable to do it themselves. Anyone wishing to avail himself of this offer is invited to lend a copy of his film to the distribution officer, British Film Institute, 4, Great Russell Street, London, W.C.2. The film will be viewed by members of the medical committee, and, on their recommendation, a copy will be made and the original returned. The film will then be available for hire from the film library of the British Film Institute, the copyright, however, remaining with the owner.

COMING EVENTS

West End Hospital for Nervous Diseases.—Clinical demonstrations in neurology will take place every Tuesday at 5.30 p.m. from October 13 until December 15 at the Out-patient Department, 40, Marylebone Lane, London, W.1. The demonstrations are open to postgraduates, medical practitioners, and senior medical students.

Guild of St. Luke, SS. Cosmas and Damian.—The annual mass and communion will take place on St. Luke's Day, Sunday, October 18, at 8.30 a.m. in the crypt of Westminster Cathedral.

Medical Society for the Care of the Elderly.—A general meeting will be held at the City Hospital, Nottingham, on October 22 and 23.

Wessex Rabere Club.—The autumn dinner of the club will take place at the Lansdown Grove Hotel, Bath, on October 24. Membership is open to all Bart's men practising in the West Country. Further details may be obtained from the hon. secretary, Mr. A. Daunt Bateman, 11, The Circus, Bath.

British Association of Physical Medicine.—A postgraduate course in physical medicine will be held on Saturday mornings from October 31, 1953, to January 23, 1954, at various London hospitals. The fee for the course is two guineas. Further particulars can be obtained from the honorary secretary of the association, 45, Lincoln's Inn Fields, London, W.C.2.

NEW ISSUES

Abstracts of World Medicine.—The October issue (Vol. 14, No. 4), which is now available, contains abstracts of important papers on both medical and surgical subjects drawn from journals published in some 20 different countries and in all five continents. In addition to the various branches of clinical medicine and surgery, the subjects covered include pathology, bacteriology, pharmacology, and chemotherapy, and there are also sections dealing with medical genetics, industrial medicine, anaesthetics, radiology, and the history of medicine.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request.

SOCIETIES AND LECTURES

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

Sunday, October 11
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Adolph Tuck Hall, Woburn House, W.C.3, 3 p.m., Presidential address by Mr. Albert Davis: Some Obstetric and Gynaecological Curiosities.

Monday, October 12
● **INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.**—At Chelsea Hospital for Women, 4.30 p.m., Mr. R. H. Boyd: Contraception.
LONDON UNIVERSITY.—At University College Hospital Medical School, 5.30 p.m., Special University Lecture in Pathology by Professor E. G. D. Murray (Montreal): Surmise on Some Trends in Bacteriology.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., general meeting. Presidential Address by Mr. E. W. Riches: Significance of Haematuria.
● **POSTGRADUATE MEDICAL SCHOOL OF LONDON.**—4 p.m., Dr. W. S. C. Cope: Treatment of the Rheumatic Diseases with Cortisone and A.C.T.H.
● **ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.15 p.m., Mr. J. Cosbie Ross: Management of the Bladder in Spinal Injury; 6.30 p.m., Mr. D. H. Patey: Surgery of the Parotid Gland.
● **WESTMINSTER MEDICAL SCHOOL.**—At Church House, Great Smith Street, 3 p.m., Inaugural Address by Lord Radcliffe.

Tuesday, October 13

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor R. W. Russell: Experimental Psychopathology.
CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, 41, Queensgate Terrace, S.W.7, 7.30 p.m., dinner, followed by a discussion: The McNaghten Rules, to be opened by Sir Ernest Gowers, Dr. Desmond Curran and Dr. Elliot Slater.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. C. O. Carter: Genetics in Dermatology.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—5 p.m., Second Dorothy Platt Memorial Lecture by Professor E. C. Dodds, F.R.S.: Recent Knowledge of the Endocrine Background of Malignant Disease.

MANCHESTER MEDICAL SOCIETY: SECTION OF SURGERY.—At Medical School, Manchester University, 8 p.m., Presidential Address by Mr. O. M. Duthie: Retinal Detachment.

● **ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.15 p.m., Mr. William Gissane: Major Injuries of the Hand—Open and Closed; 6.30 p.m., Sir Harry Platt: Tumours of Bone.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Mr. G. F. Gibberd: Management of Disproportion.

Wednesday, October 14

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. I. Whimster: Developmental Anomalies.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., symposium to be opened by Professor Andrew Wilson: Use and Abuse of Antibiotics.

MANCHESTER MEDICAL SOCIETY: SECTION OF PATHOLOGY.—At Medical School, Manchester University, 4.30 p.m., symposium on Transfusion Problems by Dr. R. F. Jennison and Dr. F. Stratton, followed by a discussion.

MIDLAND MEDICAL SOCIETY.—At Queen's Hotel, Birmingham, 8.15 p.m., annual dinner and inaugural meeting.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor A. C. Frazer: Normal and Defective Fat Absorption.

● **ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.15 p.m., Professor C. G. Robt: Arterial Aneurysms; 6.30 p.m., Mr. E. T. C. Milligan: Surgery of the Anal Canal.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—4 p.m., Bengul Memorial Award Lecture by General A. M. E. Sicé (Baile): Evolution of Therapeutics in the Course of the Last Few Years (Illustrated).

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., lecture-demonstration by Dr. J. D. W. Pearce: Psychological Medicine.

● **SCHOOL OF PHARMACY.**—At Beveridge Hall, Senate House, 3 p.m., inaugural address by Sir Henry Cohen.

Thursday, October 15

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Presidential Address by Mr. Cuthbert Andrews: The Industry and the Institute.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. C. J. Poplak: Biological Synthesis.

CHADWICK TRUST.—At Royal Society of Arts, 5.30 p.m., public lecture by Mr. C. J. Regan: Air Pollution.

EDINBURGH CLINICAL CLUB.—At 7, Drumsheugh Gardens, 8 p.m., Dr. Douglas Miller: Common Obstetrical Injuries and their Sequelae.

EPSOM AND SUTTON INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Cane Hill Hospital, Coulsdon, Surrey, 8 p.m., annual meeting. Dr. Alexander Walk: Royal Commission on Marriage and Divorce; Dr. F. B. E. Charatan: Psychiatric Aspects of Pulmonary Neoplasm.

● **INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY.**—At National Hospital, Queen Square, W.C.3, 5.30 p.m., Dr. A. P. Norman: Aetiological Factors of "Congenital" Group (Kernicterus, Birth Trauma, Anoxia, Developmental Abnormality).

NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Manchester Royal Infirmary, 5 p.m., presidential address by Mr. F. Ronald Edwards: Recent Trends in Pulmonary Surgery.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. W. R. Bett: Truants from Medicine (with lantern slides).

● **ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.15 p.m., Mr. T. Holmes Sellers: Surgery of the Pericardium; 6.30 p.m., Mr. Geoffrey L. Keynes: Parathyroid Surgery.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., presidential address by Dr. Norman White.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor O. Wyss (Zurich): Organization of the Respiratory Centre.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Desmond Curran: psychiatric demonstration.

SOCIETY OF CHEMICAL INDUSTRY: MICROBIOLOGY GROUP.—At Medical Society of London, 6.15 p.m., Dr. E. F. Gale: Actions of Antibiotics in the Bacterial Cell.

Friday, October 16

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 2.15 p.m., Diagnosis Section Meeting. Dr. J. W. Pierce: Pulmonary Manifestations of Fungus Diseases.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. J. E. M. Wigley: Eczema.

INSTITUTE OF NEUROLOGY.—5 p.m., Dr. Paul Bucy (U.S.A.): Cervical Hypertrophic Pachymeningitis—Diagnosis and Treatment.

LONDON UNIVERSITY.—At Guy's Hospital Medical School, 5 p.m., Professor William Montagna (Brown University): The Architecture, Growth, and Differentiation of Skin.

● **POSTGRADUATE MEDICAL SCHOOL OF LONDON.**—12 noon, Dr. A. Rae Gilchrist: Coronary Sclerosis; 4 p.m., Sir Neil Hamilton Fairley, F.R.S.: Schistosomiasis.

● **ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS.**—2.45 p.m., William Meredith Fletcher Shaw Memorial Lecture by Mr. J. W. Bide: Some Manchester Pioneers in Obstetrics and Gynaecology.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—3 p.m., Harveian Oration by Dr. George Graham: Value of Physiology in Medicine.

Saturday, October 17
BIOCHEMICAL SOCIETY.—At Westminster Medical School, 11 a.m., 322nd meeting, scientific papers.

APPOINTMENTS

DUMMER, F. H. M., M.B., Ch.B., C.P.H., D.P.H., Medical Officer of Health, Borough of Andover, Rural Districts of Andover, Whitechurch and Kingsclere, Hants.

FISHER, MARGARET L., M.B., B.Ch., House-physician to Neurological and Neurosurgical Department, Hospital for Sick Children, Great Ormond Street, London, W.C.

GRANT, DONALD KERR, M.B., B.S., M.R.A.C.P., House-physician, Hospital for Sick Children, Great Ormond Street, London, W.C.

SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—Lotte Rosenberg, M.D., D.P.M., Whole-time Assistant Child Psychiatrist (S.H.M.O.).

Hampshire Child Guidance Service; B. W. Richards, M.R.C.S., L.R.C.P., D.P.M., Whole-time Deputy Physician Superintendent and Consultant Psychiatrist, St. Lawrence's Hospital, Caterham; G. W. Garland, M.D., M.R.C.O.G., Part-time Consultant Obstetrician and Gynaecologist, Lambeth Hospital; Mrs. Michael Kohnstamm, M.D., Whole-time Assistant Chest Physician (S.H.M.O.), King George V Hospital, Godalming; A. M. MacArthur, M.B., F.R.C.S., Part-time Consultant Thoracic Surgeon, St. Helier, Croydon and Redhill Groups; B. A. Pomryn, M.B., B.S., D.P.M., Whole-time Assistant Psychiatrist (S.H.M.O.), Belmont Hospital; E. P. H. Charlton, M.D., D.P.M., Whole-time Physician Superintendent and Consultant Psychiatrist, Banstead Hospital; G. V. Sybil Aldridge, M.B., B.S., D.C.H., Part-time Chest Physician (S.H.M.O.), Battersea Chest Clinic; Lois E. Hurter, M.D., M.R.C.O.G., Part-time Consultant Obstetrician and Gynaecologist, Lambeth and Wandsworth Groups; F. Denny, M.D., M.R.C.O.G., Part-time Consultant Obstetrician and Gynaecologist, Chelsea, and Fulham and Kensington Groups; C. P. Mills, M.B., B.S., Surgical Registrar, Royal Hants County Hospital, Winchester; Thomas P. Nash, F.R.C.S., Surgical Registrar, Southampton General Hospital; R. Alhadeff, F.R.C.S., Surgical Registrar, Mayday Hospital; A. O. Watkins, F.R.C.S., Surgical Registrar, Princess Beatrix Hospital; Mary D. North, M.B., B.S., Medical Registrar, St. Stephen's Hospital; Margaret H. North, L.R.C.P.&S.Ed., Anaesthetic Registrar, St. Stephen's Hospital; J. Levin, M.B., Ch.B., Anaesthetic Registrar, Fulham Hospital; J. Towers, B.M., B.Ch., D.P.M., Senior Psychiatric Registrar, Graylingwell Hospital; R. H. Boardman, M.B., B.Chir., D.P.M., Senior Psychiatric Registrar, Springfield Hospital; V. N. Bagadia, M.D., and H. K. Rose, L.R.C.P.&S., D.P.H., Psychiatric Registrars, Netherne Hospital; Rosemary M. W. Ince, M.B., Ch.B., Pathological Registrar, Portsmouth and Isle of Wight Area Pathological Service; Diana G. Partridge, M.D., D.C.H., Senior Thoracic Medical Registrar, Croydon Chest Clinic; H. G. Dixon, M.B., B.S., M.R.C.O.G., D.Obst. R.C.O.G., Obstetric and Gynaecological Registrar, Southlands Hospital; M. C. Michelow, M.B., B.Ch., D.Obst. R.C.O.G., Obstetric and Gynaecological Registrar, Redhill County Hospital; Margaret M. Downes, M.B., Ch.B., M.R.C.O.G., Obstetric and Gynaecological Registrar, St. Luke's Hospital; R. D. Nicholson, M.B., B.S., Orthopaedic Registrar, Winchester Group of Hospitals; W. E. J. Bennett, F.R.C.S., Surgical Registrar, St. James Hospital; Mary D. Campbell, L.R.C.P.&S., Anaesthetic Registrar, St. Mary Abbots Hospital; G. Dutton, M.B., B.S., Psychiatric Registrar, Botley Park Hospital; K. W. Cochrane, M.B., B.S., Ch.B., F.R.C.S.Ed., D.Obst. R.C.O.G., Obstetric and Gynaecological Registrar, Epsom and District Hospital; B. A. Gavourin, M.B., B.S., D.Obst. R.C.O.G., Obstetric and Gynaecological Registrar, Mayday Hospital; W. R. Parkes, M.B., Ch.B., Medical Registrar, Fulham Hospital; J. A. C. Brown, M.B., B.S., D.Obst. R.C.O.G., Surgical Registrar, Redhill County Hospital; M. G. Jones, M.B., B.Ch., Surgical and Orthopaedic Registrar, Queen Mary's Hospital for Children; R. W. L. Calderwood, M.R.C.S., L.R.C.P., Orthopaedic Registrar, St. James Hospital; A. Bramley, M.B., Ch.B., B.D.S., and I. H. Heslop, M.B., B.S., F.D.S., Dental Registrars, Rookdown House, Basingstoke; A. G. Pollen, M.B., B.S., and C. H. J. Rey, F.R.C.S., Surgical Registrars, Lambeth Hospital; A. J. Heber, M.B., B.S., Anaesthetic Registrar, Redhill County Hospital.

BIRTHS, MARRIAGES, AND DEATHS

MARRIAGES

Horne-Mackenzie.—On September 30, 1953, at King's College Chapel, Aberdeen, James Landess Horne, M.D., D.P.H., of Maybank, Strathpeffer, to Margaret Marian Mackenzie, M.B., Ch.B., of Croft Mhairi, Tain, Ross and Cromarty.

DEATHS

Farr.—On August 29, 1953, at 5, Burnham Gardens, Bognor Regis, Sussex, Arthur Farr, M.R.C.S., L.R.C.P., late of Kensington, London, W., aged 79.

Kilgally.—On July 14, 1953, in Kenya, Charles Randolph Kilgally, C.M.G., M.V.O., M.B., B.Ch., D.P.H., Surgeon Lieutenant-Colonel, Grenadier Guards, retired, late of Drimcong, Moycullen, Co. Galway, Ireland, aged 93.

King.—On September 3, 1953, near Bath, Somerset, Lorna Susan King, M.B., B.S., formerly of Bromley, Kent.

McHugh.—On September 8, 1953, at his home, 101, Withington Road, Manchester, Louis Joseph Edward McHugh, M.B., B.Ch., aged 78.

MacLennan.—On September 8, 1953, at All Saints' Hospital, Chatham, Kent, Kenneth Falconer Macrae MacLennan, M.B., Ch.B.

Napier.—On September 10, 1953, George Napier, M.B., Ch.B., D.P.H., of Salisbury, Wilts.

Newton.—On August 31, 1953, at 4, Walden Road, Welwyn Garden City, Hertts, Hallé Newton (formerly Marsten), M.R.C.S., L.R.C.P.

Nicol.—On August 30, 1953, Henry Maurice Dunlop Nicol, M.B., B.Ch., of Great Amwell House, Ware, Herts, and 146, Harley Street, London, W., aged 69.

Robertson-Ross.—On September 7, 1953, at "Laurel Trees," West Coker, Som., James Ewen Robertson-Ross, L.M.S.S.A., aged 63.

Taylor.—On September 2, 1953, Maud Taylor, M.D., late of Godfrey's Farm, Radwinter, Essex.

Tensdale.—On August 26, 1953, at his home, West Retford House, Retford, Notts, John Cambridge Tensdale, M.B., Ch.B., aged 75.

Wallace.—On August 22, 1953, at St. Thomas's Hospital, Godalming, Surrey, John Wallace, O.B.E., T.D., M.D., Colonel, R.A.M.C. (T.), retired.

Will.—On September 7, 1953, whilst on holiday, Ella Kennedy Will, M.R.C.S., L.R.C.P., of 1, Winsford Terrace, Edmonton, London, N.

Zuckermann.—On September 29, 1953, Ernst Zuckermann, M.D., of 14, Oxford Street, Nottingham.

Any Questions?

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

Pain on Ejaculation

Q.—A man of 48 has suddenly developed pain in the glans penis on ejaculation. There is no history or evidence of genito-urinary disease. What is the likely cause, and what treatment is advised?

A.—In this case the pain in the glans penis is almost certainly referred from the prostate or vesicles. These structures must therefore be carefully investigated for signs of infection; the secretion expressed by prostatic and vesicular massage should be examined for pus cells, and the urine voided subsequently for the presence of threads. A small concretion in the prostate might also cause pain on ejaculation. If no physical lesion can be found the possibility of the pain being psychogenic must be considered. A husband who is unable to satisfy his wife sexually sometimes falls back on pain as an excuse for this. Diathermy treatment, using rectal and suprapubic electrodes, is often helpful.

Which Barbiturate?

Q.—How do the various official barbiturate preparations differ in action, effective dose, rate of elimination, and toxicity?

A.—This topic often occupies a whole chapter in a modern textbook of pharmacology, but a good and succinct account will be found in the *National Formulary*, 1952.

The duration of action of a barbiturate depends upon its rate of degradation by the liver, absorption by other tissues, excretion by the kidney, on the rate and route of administration, and also upon the dose given. In general the long-acting barbiturates take effect more slowly than the short-acting ones when given orally. It is usual to classify the substances according to their duration of action as long-, medium-, and short-acting drugs. Barbitone and its sodium salt are almost entirely removed by renal secretion, and a single dose may be effective for 12 hours or more. This substance may be detectable in the urine for several days after a single dose. Phenobarbitone and methylphenobarbitone are partly excreted by the kidneys and partly broken down in the liver. All these substances are slowly eliminated and cumulation may occur, especially if renal function is poor. Medium-acting barbiturates such as pentobarbitone sodium and quinalbarbitone sodium are more rapidly metabolized by the liver, while the short-acting thiopentone sodium is probably dealt with by most tissues including liver. The barbiturates mentioned above are official in the B.P. (1953), but of these only phenobarbitone and quinalbarbitone are widely used. The B.P.C. (1949) includes also the medium-acting allobarbitone, amylobarbitone, and butobarbitone, and the short-acting cyclobarbitone and hexobarbitone. The use of the last-named is, however, dying out in Britain.

The actions of barbiturates vary from sedation, for which some like phenobarbitone are specially suitable, to full anaesthesia. With some compounds such as cyclobarbitone most stages between these two extremes can be usefully obtained by varying the dosage. The short-acting thiopentone sodium is commonly given by intravenous injection. Doses used obviously vary according to the effect desired. Phenobarbitone is used as a sedative in doses of 30–120 mg. (½–2 gr.) and barbitone as a hypnotic in doses of 0.3 to 0.6 g. (5–10 gr.). Medium acting barbiturates are often given in doses of 90–180 mg. (1½–3 gr.) for hypnosis; cyclobarbitone is used in double these amounts, while quinalbarbitone

sodium may be useful in doses as low as 45 mg. ($\frac{3}{4}$ gr.) for insomnia or temporary hypnotic action. Patients vary in sensitivity and it is impossible to define dosage accurately. Large doses of the long-acting compounds are unsuitable as hypnotics as their effect persists for too long.

The toxicities of the barbiturates roughly parallel their therapeutic doses, the therapeutic ratio for all being about the same. Phenobarbitone and methyl phenobarbitone have the additional property of depressing the activity of the motor cortex; hence their use in treating epilepsy.

It is relevant to emphasize that, except in full anaesthetic dosage, barbiturates have no analgesic action. For this a suitable analgesic should be used in addition to a barbiturate if an analgesic effect is also desired.

The practitioner is strongly recommended to choose two or three representative barbiturates and to make himself familiar with their particular merits and defects.

Sudden Unilateral Deafness

Q.—What are the possible causes of unilateral tinnitus and almost complete nerve deafness of sudden onset in an adult? The condition developed, with a subjective "bang" in the affected ear, four months ago and has persisted. A vascular lesion of the cochlea is suspected.

A.—The most likely cause of a sudden and complete deafness in one ear without vertigo is some toxic infection of the ganglion cells, such as may happen in mumps or as the result of streptomycin intoxication. A vascular accident is possible, but signs of a vestibular disaster (vertigo and vomiting) would also be present. In certain cases of endolymphatic hydrops (Ménière's disease) the distension of the endolymphatic system may continue unrelieved until the membranous system is ruptured with complete and irreversible loss of function. If a detailed otological examination does not reveal any cochlear function, then the likelihood of any return of hearing is remote, though the tinnitus may continue unabated. If hydrops of the labyrinth is suspected, then there is some slight prospect of improvement in hearing if a strict low-sodium and limited fluid diet is followed.

Treatment of Amoebiasis

Q.—What is the modern treatment of amoebiasis? Is a change of climate likely to make a relapse more probable?

A.—The drugs of greatest value in the treatment of intestinal amoebic infections are emetine hydrochloride and emetine bismuth iodide.

In acute amoebic dysentery it is probably best to commence with two or three intramuscular injections of 1 gr. (65 mg.) of emetine hydrochloride; this usually brings the diarrhoea under control rapidly. Treatment is continued with emetine bismuth iodide (E.B.I.) given in keratin-coated capsules and in doses of 3 gr. (200 mg.) nightly for ten nights. In order to combat the nausea which is commonly caused by this drug, 1–2 gr. phenobarbitone is administered half an hour before the E.B.I. is given. Most patients will then sleep through the period during which the nausea would have been experienced. Injections of emetine may be omitted in the case of cyst-passers who are not suffering from dysenteric symptoms. This treatment has been shown to eradicate 90% of infections, and there is no satisfactory evidence that superior results are obtained with any of the antibiotics or by following the course of E.B.I. with one of oxyquinoline compounds, arsenic, or enemata containing amoebicidal substances.

At the conclusion of the last war treatment was commonly commenced with penicillin on the assumption that secondary infection might thereby be controlled. The results were disappointing, and it is now no longer commonly employed. More recently aureomycin has been used, particularly in America. Encouraging preliminary reports were made, and there is no doubt that the drug will bring an acute attack of dysentery under control; 50% of cases, however, relapse within eight weeks of completion of treatment. Clinical

trials with terramycin are at present being carried out, and it seems safe to say that it is more effective than aureomycin, though it is doubtful whether it is as effective as emetine and emetine bismuth iodide. There is some evidence that resistant cases may respond better to terramycin or aureomycin given in conjunction with emetine bismuth iodide than they do to the latter given alone. Resistant infections in which organisms persist in the faeces in spite of treatment are, however, very seldom encountered. Cases in which stool examination is negative after treatment are not uncommonly erroneously labelled resistant because of persisting bowel symptoms. In these, however, the disturbance is usually of a functional nature rather than the result of persisting infection.

A change of climate is not likely to make a relapse of amoebic dysentery more probable. The only important consideration in this respect is whether the change in climate entails a change in environment leading to a greater chance of reinfection.

Hormone Treatment of Anorexia Nervosa

Q.—Has cortisone or A.C.T.H. any place in the treatment of anorexia nervosa?

A.—In so far as anorexia nervosa is a primary psychopathic state, as its name implies, there would appear to be no specific indication for cortisone or A.C.T.H. It may be that in the later and more severe phases of the disorder there is a secondary disturbance of pituitary and adrenal function, and if the latter could be demonstrated there might be an indication for the use of these hormones. However, it might be thought that in view of their appetite-stimulating effect in non-endocrine states such as rheumatoid arthritis they might be properly used regardless of the primary condition. However, Dr. C. F. Rolland recently reported at a meeting of the Nutritional Society (*Journal*, March 14, p. 613) that such attempts have not been successful and any gain in weight was due to the retention of salt and water. It would therefore appear better to rely on the more conventional methods of removal from the usual surroundings to hospital or nursing-home, reassurance, encouragement and intelligent persuasion, and suggestion.

Dutch Cheese Rind

Q.—Of what is the waxy rind of a Dutch cheese composed? Is it indigestible? My landlady's small boy has developed a taste for it.

A.—The red Dutch cheeses are first dyed with aniline dye and then coated with indigestible wax, usually paraffin. Eating the rind will probably do little harm to the boy, but neither will it do him much good.

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

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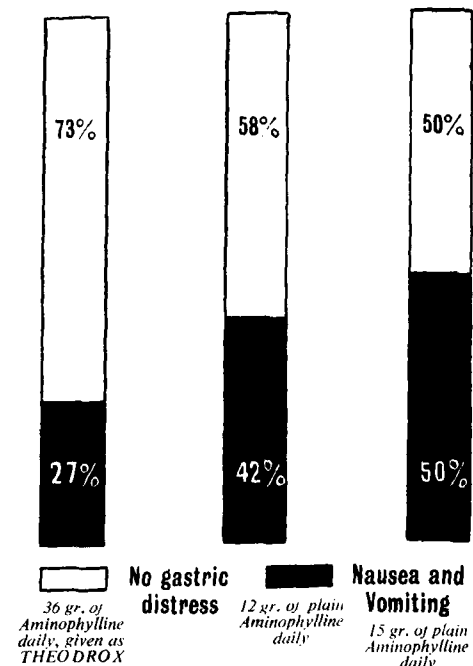
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REFERENCES

- (1) Studies with Two New Theophylline Preparations, *Amer. J. med. Sci.*, 224: 627, 1952.
- (2) A New Approach to Increasing Tolerance to Oral Aminophylline, *Postgrad. Med J.* 13: 432, May, 1953. Abstracted; *Practitioner* 171: 328 (Sept. 1953)

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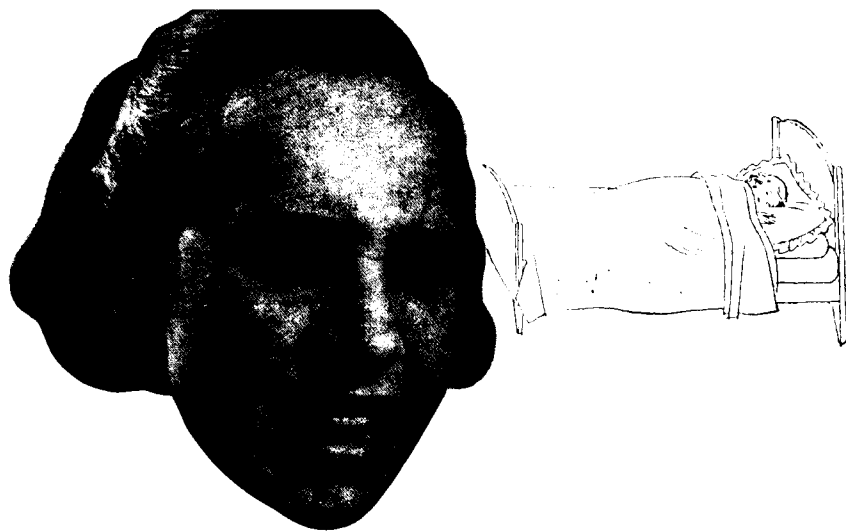
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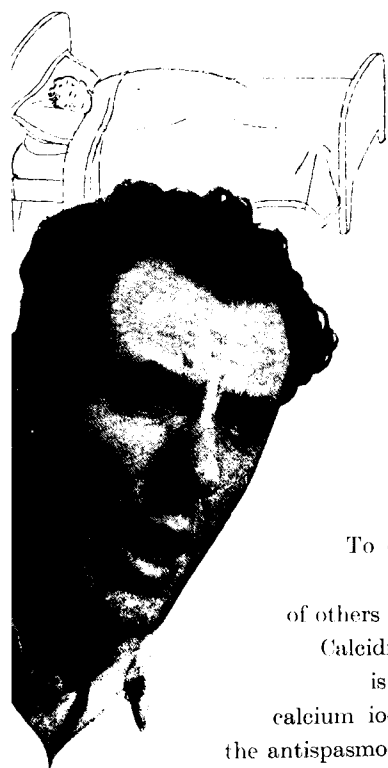


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BRITISH MEDICAL JOURNAL

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CHRONIC GASTRIC ULCER

A COMPARISON BETWEEN A GASTROSCOPICALLY CONTROLLED SERIES TREATED MEDICALLY AND A SERIES TREATED BY SURGERY

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Chronic duodenal and gastric ulcers are usually studied together under the title of "peptic ulcer," but there is evidence to suggest that their aetiology is different. Duodenal ulcer is predominantly a disease of young adults with a thick hypersecreting gastric mucosa, while gastric ulcer is commonest in the middle-aged with a normal or thinning mucosa and is associated with normal or diminished acidity. The treatment of duodenal ulcer is to some extent physiological in that, whether by neutralization, vagotomy, or partial gastrectomy, the effect is to reduce the high acidity. In the case of gastric ulcer, however, the application of the same principles is less rational, although, at present, the only effective form of treatment. These considerations make it advisable to study them separately.

For economic and clinical reasons there has been an increasing tendency towards the use of surgery in the treatment of chronic gastric ulcer. It is no longer possible in larger centres to compare the late results in controlled series, the one treated medically and the other surgically, but some useful information may be forthcoming from an analysis of uncontrolled material.

Present Investigation

The present investigation concerns 498 patients with chronic gastric ulcer. They are divided into two series—one treated medically and the other surgically in the gastro-enterological clinic at St. James's Hospital during the years 1940–6 inclusive. Late information concerning nearly all was obtained in 1952, giving a minimum follow-up period of five and a maximum of twelve years.

There are 262 patients in the medical series, in which the criterion for inclusion was the presence of a gastroscopically confirmed *active* chronic gastric ulcer. In view of the rarity of the combination of even quiescent duodenal ulcer with gastric carcinoma (only two have been encountered in over 2,200 gastrectomies in ten years at St. James's Hospital) and the need for more evidence on the "ulcer-cancer" problem, those patients in whom a previous or concomitant duodenal ulcer was suspected have been omitted. Also excluded are those patients who were submitted to a curative operation within one year of gastroscopic diagnosis. Analysis of this series may be expected to reveal a preponderance of patients with short histories or mild symptoms, of

those who respond rapidly to treatment and relapse rarely, of those who by reason of age or poor general condition are considered to be unsuitable for surgery, and of those who refuse operation.

In the surgical series there are 254 cases. Patients with additional duodenal ulcers or scars are not included. Those in whom the only operation was repair of a perforated ulcer are excluded, since this cannot be regarded as a curative procedure and since the localization of juxtapyloric perforations may be difficult at emergency operation. Because this is a clinic specializing in gastric disorders the surgical series contains a proportion of technically difficult cases which had been referred from elsewhere. For example, the incidence of high lesser-curve ulcers will be greater than is normally found.

Eighteen patients, sixteen men and two women, appear in both series.

Age and Sex

Of the 498 patients 387 were men and 111 were women, a ratio of 3.5:1, which is the usual recent finding, but a reversal of earlier statistical figures. The reason for this change is the great reduction in the incidence of gastric ulcer in young women.

It is not possible to give complete information on the ages at which the diagnosis of gastric ulcer was first made, since in a certain number of cases this was done by x-ray examination of a barium meal previous to the time of gastroscopy. Table I does, however, give some indication, and shows the age distribution of cases at

TABLE I.—Gastric Ulcer: Age and Sex Incidence

Age (years)	Medically Treated		Surgically Treated	
	Men		Men	
	No.	%	No.	%
10–19	—	—	1	1.4
20–29	7	3.7	1	1.4
30–39	17	8.9	6	8.5
40–49	51	26.7	15	21.1
50–59	51	26.7	26	36.6
60–69	53	27.7	17	23.9
70–79	12	6.3	5	7.0
Total	191		71	

Note: Combined figures are not given, since 16 men and 2 women appear in both series.

the start of the investigation, thus serving as a useful baseline. In addition it shows the ages at which patients came to operation.

It is unusual for patients with chronic gastric ulcer to present at hospital before the age of 30, but after this there is a steady increase in numbers until the middle fifties. As might be expected, most of the youngest and oldest patients were treated conservatively. In both sexes the highest operation rate was in the sixth decade and a higher proportion of men than of women were treated by surgery.

Age at Onset of Symptoms and Length of History

The average age at the onset of symptoms was 43.6 years in men and 44.6 years in women. The similarity between the two sexes is clearly shown in Table II, where the series are amalgamated. These figures confirm the fact that, although gastric ulcers may start at any age, they most commonly do so after the age of 30.

In Table III a comparison is given of the length of symptoms in the two series. It must again be borne in mind that in the medically treated series the times given are not necessarily those of the initial diagnosis. Amongst the men one finds that those with short histories tend to be treated medically. Why this does not hold good for women

TABLE II.—Gastric Ulcer: Age at Onset of Symptoms

Age at Onset (years)	Medical and Surgical				Men and Women	
	Men		Women			
	No.	%	No.	%	No.	%
10—	9	2.3	7	6.3	16	3.2
20—	48	12.4	7	6.3	55	11.0
30—	79	20.4	19	17.1	98	19.7
40—	115	29.7	33	29.7	148	29.7
50—	75	19.4	28	25.2	103	20.7
60—	35	9.0	11	9.9	46	9.2
70+	8	2.1	2	1.8	10	2.0
Unstated	18	4.7	4	3.6	22	4.4
Total	387		111		498	

TABLE III.—Gastric Ulcer: Length of History

Length of History (years)	Medically Treated		Surgically Treated	
	Men	Women	Men	Women
	No.	%	No.	%
Under 1	40	20.9	7	9.9
1-3	25	13.1	14	19.7
3-5	26	13.6	8	11.3
5-10	32	16.8	13	18.3
10-20	31	16.2	12	16.9
Over 20	28	14.7	15	21.1
Unstated	9	4.7	2	2.8
Total	191		71	

Note: The majority of the "unstated" cases fell into the longer history groups. They were recorded as "many years."

is not clear. It would seem that women, if they do not have an operation early in their ulcer history, become adapted to its presence better than men, possibly because they can, for domestic reasons, treat their recurrences more thoroughly. There is a falling off of the operation rates in men with a history of over 20 years. These too will have learnt to "live with their ulcer," and for this reason their appearance at hospital should excite suspicion that recent symptoms which they attribute to their ulcer may be due to other causes (Tanner, 1951).

Sites of Chronic Gastric Ulcer

The impression in this clinic that the high posterior aspect of the lesser curve is the site of predilection for chronic gastric ulcers in women is confirmed (Table IV). There is a pronounced drop in the frequency as the lower stomach is approached, and ulcers in the pyloric antrum and canal

are exceptional. This last observation has been made on several previous occasions (see Ivy, Grossman, and Bachrach, 1951). In men, on the other hand, the distribution of ulcers from the cardia to the pylorus is more even, with the highest incidence in the mid and lower body, and over 10% are found distal to the angulus. The reasons for these differences between men and women are unknown.

TABLE IV.—Sites of Chronic Gastric Ulcer

Vertical			Transverse		
Site	Medical and Surgical		Site	Medical and Surgical	
	Men	Women		Men	Women
	No. %	No. %		No. %	No. %
High body ..	78 19.2	52 43.3	Posterior lesser curve Lesser curve Anterior lesser curve Greater curve .. Angulus .. Pylorus and antrum .. Unknown	119 29.3	53 44.2
Mid body ..	109 26.8	39 32.5		122 30.0	47 39.2
Low body ..	58 21.7	20 16.7		33 8.1	10 8.3
Angulus	74 18.2	7 5.8		1 0.2	1 0.8
Pylorus and antrum	55 13.5	1 0.8		74 18.2	7 5.8
Unknown ..	2 0.5	1 0.8	55 13.5	1 0.8	
			2 0.5	1 0.8	
Total	406	120	Total	406	120

Note: 2 men had three ulcers each. 15 men and 9 women had two ulcers each.

TABLE V

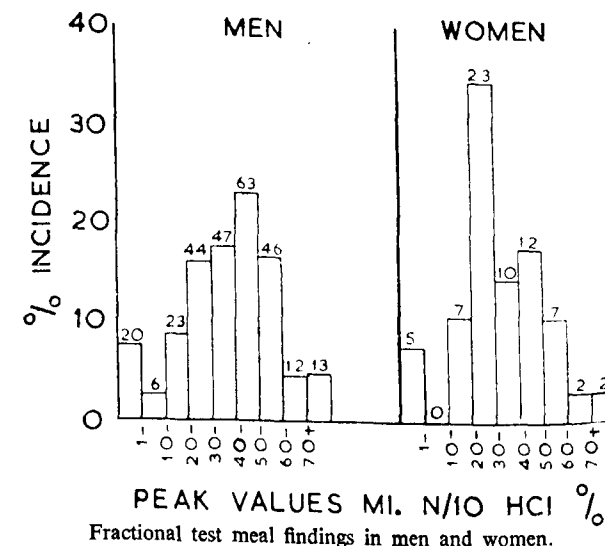
	High Lesser Curve			Mid Lesser Curve			Low Lesser Curve		
	Ant.	Mid.	Post.	Ant.	Mid.	Post.	Ant.	Mid.	Post.
Men	3	31	44	6	53	49	24	38	26
Women	3	20	29	6	16	17	1	11	7

In the body of the stomach the anterior lesser curve and anterior wall of the stomach are comparatively immune to peptic ulceration, while the posterior lesser curve is very susceptible (see Table V). In men the differences in anterior and posterior ulceration decrease as the angulus is approached, whilst in women the high proportion of posterior ulcers is maintained.

Fractional Test Meal

Results of a fractional test meal, using gruel as the stimulant, were available in 342 patients. The peak values of free hydrochloric acid measured as millilitres of N/10 HCl are shown in the Chart.

The highest incidence in men was with free acidity between 40 and 50 ml. (63), and in women 20 to 30 ml. (23). The age of the patient at the time of the test meal makes little difference to the findings, and it is only by gross



grouping that any higher incidence of hypochlorhydria in the older patients can be shown (Table VI).

Amongst the women, in whom the numbers are smaller, the age of the patient seems to be completely unrelated to the test-meal findings. It seems to be the presence of a

TABLE VI.—Chronic Gastric Ulcer: Acidity in Relation to Age (Men Only)

Peak Values ml. N/10 HCl	Men under 50		Men over 50	
	No.	%	No.	%
0-19	15	14.3	34	20.1
20-39	35	33.3	56	33.1
40-59	41	39.0	68	40.2
Over 60	14	13.3	11	6.5
Total	105		169	

degenerate mucosa rather than the age of the patient which leads to the formation of a gastric ulcer, though age indirectly affects the incidence in so far as mucosal atrophy increases with increasing years.

Although there are differences in the fractional test meal findings when they are related to the site of the ulcer in the stomach, they are not great, and it has not proved possible to work out any definite correlation.

Comparison between different series of gastric analyses is well-nigh impossible owing to different techniques used and differing interpretations put upon the results. The results in this investigation are given here, since the gruel test meal is probably the type of gastric analysis most widely used in this country.

Early Results of Treatment

Medical Series

The unceasing flow of papers to the journals shows that there is no unanimity concerning the effectiveness of individual methods of treating gastric ulcers. Suffice it to say that nearly all will heal on rest in bed, regular feeds, and that antacids, which were the general principles adopted in this series. Five men and one woman died during their initial stay in hospital—three of haemorrhage from their ulcers, two of pneumonia, and one of bronchial carcinoma.

The normal procedure is for a patient suspected of having a gastric ulcer to be gastroscopied within a few days of first being seen and then at regular intervals—usually fortnightly. Patients are kept under a strict regime until there is evidence, preferably gastroscopic, that the ulcer is healed. The Schindler gastroscope was used for the earlier cases and the Hermon Taylor gastroscope for the later ones.

Surgical Series

The procedures and immediate results in this series, which includes emergency operations, are shown in Table VII.

TABLE VII.—Surgical Series: Procedure

Procedure	No.	Deaths	Mortality
Local excision	4	3	75.0%
Gastro-jejunostomy	12	3	25.0%
Partial gastrectomy (whole series)	238	15	6.3%
Partial gastrectomy (excluding 1940-1)	175	5	2.9%

Note: Operative deaths are taken as all deaths occurring within one month of operation.

In 1940 and 1941 there were 13 operative deaths (10 following partial gastrectomy, 3 following gastro-jejunostomy), and the figures for these two years account for the high mortalities. All these deaths occurred during the first five months of intensive night bombing on London, and, although the causes of death seemed to bear no direct relationship to the bombing, there can be little doubt that they were due to resistance being lowered as a result of stress (Tanner, 1946, 1951).

Many of these patients were operated on in the penicillin era, and it is of interest to compare the figures

with the more recent results. In the last 350 partial gastrectomies performed by one of us (N.C.T.) before 1953 for chronic gastric ulcer, unaccompanied by duodenal ulcers or scars or by oesophageal ulcers, there have been four operative deaths—an incidence of just over 1%. These include emergency operations for haematemesis, of which there were 38 cases with two deaths.

Surgery in the treatment of gastric ulcer may be expected to carry a higher mortality than for duodenal ulcer, since one is dealing with an older age group. Table VIII shows the correlation between the age of the patient and the operative mortality.

TABLE VIII.—Surgical Series: Age of Patients Dying Post-operatively

Age (years)	No. in Series	Died	
		No.	%
40-	65	2	3.1
50-	107	9	8.4
60-	44	7	15.9
70-79	7	3	42.9

Unless there is some strong indication for surgery, patients over the age of 65 are treated medically in this clinic, and the older age groups contain a high percentage treated by emergency operation for uncontrolled haemorrhage.

Local excision of ulcers was practised only as an emergency operation for those patients in dire straits from uncontrolled haemorrhage. Gastro-jejunostomy was reserved for the feeble and elderly with obstructive symptoms. Partial gastrectomy was the operation of choice both as an emergency and as a planned procedure. The type most frequently performed was the antecolic Polya-Hofmeister (196 cases), with or without a Pauchet extension, depending upon the site of the ulcer. In 1946 the Billroth I type of partial gastrectomy was used more often, and has since become the operation of choice for chronic gastric ulcer, as it is a simpler and perhaps more physiological procedure.

Method of Follow-up

A circular letter containing a questionnaire was sent to the last known address of the patient requesting him to attend at the clinic if possible, or, if unable to do so, to complete the questionnaire. In the event of failure to receive a reply to this and a postcard reminder, or the letter being returned as "unknown," "gone away," or "house demolished," any other addresses of the patient or next of kin were tried. The response was good, but many remained uncontacted. Personal visits were next paid to all possible addresses. It was often found that the house had disappeared as a result of bombing, in which case the nearest intact dwelling was tried. By this means enough information was obtained to trace well over half the missing patients. Householders were almost without exception extremely co-operative, frequently going out of their way to gather information. Where they were unable to give exact details they could often give some help. For instance, the name of the road to which the patient had moved might be known, when reference to the voters' list would give the number. One patient was run to earth working in a public lavatory and another selling newspapers outside a well-known football ground. Some 400 miles of the streets of South London were covered in this part of the follow-up, which also included tracing a series of achlorhydric patients (in press). Where known and still practising, family doctors gave assistance, and for certain cases the medical superintendents and staff of other hospitals were of invaluable help. Local registrars of births and deaths and the Registrar-General provided details of dates and causes of deaths. In addition, particulars of any of the untraced patients who would now be aged over 50 were sent to the latter in case they had died and were identifiable in the records. Insurance House and the Central Pensions Branch of the Ministry of National Insurance were able to help in tracing some of the remainder.

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Results of Follow-up—Both Series

The results of the follow-up investigations are given in Table IX.

TABLE IX.—Results of Follow-up

	Medical Series		Surgical Series	
	No.	%	No.	%
Alive and contacted ..	181	70.7	169	72.5
Dead ..	61	23.8	56	24.0
Alive, but not contacted ..	1		2	
Emigrated and not contacted ..	3	5.5	2	
Nothing known ..	10		4	3.4
Total ..	256		233	

Note: 6 patients in the medical and 21 in the surgical series died during their initial stay in hospital (see above) and are not included in the late analysis.

Deaths

Sixty-one patients in the medical and 56 in the surgical series have died since their initial stay in hospital. The causes of death in these cases are shown in Table X.

TABLE X.—Causes of Death

Cause	Medical Series		Surgical Series	
	Men	Women	Men	Women
A. Gastric:				
Carcinoma ..	2	1	3	1
Ulcer haemorrhage ..	4	1	—	—
Ulcer perforation ..	1	—	—	—
Ulcer—unspecified ..	1	—	—	—
Late post-operative ..	—	—	1	2
B. Other alimentary:				
Carcinoma large bowel ..	3	—	1	—
Appendicitis ..	1	—	1	—
Toxic hepatitis ..	—	—	1	—
C. Respiratory:				
Acute infections ..	7	1	7	—
Chronic bronchitis ..	1	1	4	—
Tuberculosis ..	3	—	6	—
Carcinoma of bronchus ..	3	1	3	—
Carcinoma of maxillary antrum ..	1	—	—	—
D. Cardiovascular:				
Heart disease ..	11	3	9	2
Cerebral vascular accidents ..	7	—	2	1
Syphilitic aortitis ..	—	—	1	—
E. Genito-urinary:				
Chronic nephritis ..	—	—	—	2
Hypernephroma ..	—	—	2	—
Post-prostatectomy ..	1	—	—	—
F. Metabolic:				
Diabetes mellitus ..	1	—	—	—
Addison's disease ..	—	—	—	1
G. Other:				
Basal-cell carcinoma ..	1	—	—	—
Bombing ..	—	2	—	—
Suicide ..	—	—	2	—
Unknown ..	2	1	4	1
Total ..	50	11	46	10

Note: Patients in the medical series who later had resections performed and who are not included in the surgical series have not been followed beyond the time of operation.

Despite the fact that the medical series might be expected to contain the majority of the aged and infirm patients, the death rates in the two series are almost exactly the same. No particular disease in either series predominates. There are too many factors involved for a more detailed statistical breakdown of the causes and rates of death to be of value, but two conditions, gastric carcinoma and pulmonary tuberculosis, require further analysis.

Gastric Carcinoma

Fifteen patients in the medical and 11 in the surgical series have developed carcinoma. In 10 (6 and 4 respectively) the primary growth was probably in the stomach. Brief particulars of these cases are presented in Table XI.

It has often been pointed out that the differentiation between chronic gastric ulcer and gastric carcinoma may be impossible before operation or even before microscopical examination of the specimen. The first two cases are almost certainly such examples, though, in both, operation was advised on account of the possibility of malignancy. In at

least two of the remaining eight cases the carcinoma arose at a different site from the ulcer. It is interesting to note that in at least two, and possibly three, of the cases the removal of the large portion of the stomach, including the chronic gastric ulcer, did not prevent the subsequent development of a carcinoma.

Estimates of the incidence of malignant change in chronic gastric ulcers—"ulcer-cancer"—have come almost entirely from the pathologists, and very strict criteria for the diagnosis have been laid down, culminating in those of Newcomb (1932). If a certain percentage—for example, 3, 6, 10, or more—of gastric ulcers become malignant, it is remarkable that in none of the present cases do we find macroscopic or microscopical evidence of "ulcer-cancer." In the medical series alone the 262 patients have had some 2,000–3,000 years of ulcer history. When may we expect them to become malignant and show the features of "ulcer-cancer"?

Brinton (1864) described ulcerating carcinomata in which ulceration kept pace with growth for many years. According to Palmer and Humphreys (1944) such cases may show all the features of "ulcer-cancer." In a previous study of patients with gastric carcinoma (Swynnerton and Truelove, 1951) the evidence suggested that the histological diagnosis of "ulcer-cancer" was not always supported by the clinical facts. The problem of malignant degeneration of gastric

TABLE XI.—Cases in Which there was Evidence of Gastric Carcinoma

Case No.	Sex	Age	Length of History	Gastroscopy	Remarks
Medical Series					
1	M	55	4 years	Irregular ulcer high lesser curve; 7 carcinoma. Failed to heal	Refused operation. Died 19 months later of "carcinoma of stomach." No necropsy
2	M	57	6 "	Antral ulcer. Only one examination	Refused operation. Developed ascites. Died 1 month later of "carcinomatosis." No necropsy
3	F	74	50 "	High posterior lesser curve ulcer. Soundly healed after 5 weeks' treatment	Died 6 years later of "haematemesis due to gastric carcinoma." Before death had lost weight and became deeply jaundiced with enlarged liver. No necropsy
4	M	56	9 "	Ulcer at angulus. Healing 2 weeks later	2 years symptom-free, then recurrence lasting 1 year before admission with epigastric mass. Resection of prepyloric carcinoma. No evidence noted of preceding ulcer
5	M	53	16 "	Ulcer at angulus. Only one examination	Readmitted 6½ years later with gastric retention. At operation small localized prepyloric carcinoma, separate from old ulcer scar at angulus
6	M	51	1 week	Mid. anterior lesser curve ulcer. Soundly healed in 6 weeks	4 years symptom-free, then 1 year recurrence of dyspepsia before resection of high ulcerating diffuse spheroidal-cell carcinoma
Surgical Series					
7	M	51	4 years	High posterior lesser curve ulcer	Partial gastrectomy. Histologically chronic peptic ulcer. Readmitted 9 years later with 2 years periodic dysphagia and substernal pain. Carcinoma of cardia resected
8	M	47	13 "	Ulcer at angulus	Partial gastrectomy. Histologically chronic peptic ulcer. Well for 6 years, then pain and diarrhoea for 4 months before death. Necropsy—diffuse carcinoma of stomach remnant
9	M	70	2 "	High lesser curve ulcer	A huge gastric ulcer penetrating and fixed to the liver treated by gastro-jejunostomy. Recurrent dyspepsia for 5 years, when he was admitted with an epigastric mass and nodular liver. Died—no necropsy
10	F	54	2 "	Low lesser curve ulcer	Partial gastrectomy. Histologically chronic peptic ulcer. 3½ years later admitted elsewhere with Krukenberg tumour of ovary and generalized abdominal carcinomatosis. Primary? stomach. Died 8 months later. No necropsy

ulcers is a clinical as well as a pathological one, and there is all too little clinical evidence in the literature. If there is an association between gastric ulcer and carcinoma, it seems to us to be due to a preference of both for the same soil rather than any direct association.

Pulmonary Tuberculosis

Pulvertaft (1952) has suggested that there may be an increased incidence of pulmonary tuberculosis following gastric resection of peptic ulcer. Among the 233 cases in the present surgical series six men have died of this disease—one seven months, three three years, one five years, and the other eight years after operation at the ages of 52, 49, 58, 62, 56, and 63 respectively. In none was the diagnosis recorded at the time of operation, but two patients who had active pulmonary lesions when operated on are still alive after seven and nine years, and their lesions are reported to be inactive. One woman died of Addison's disease 10 years after operation, and another was diagnosed as suffering from pulmonary tuberculosis seven years after gastrectomy.

In the medical series three men have died of pulmonary tuberculosis, in one only of whom was the diagnosis recorded at the time of admission for gastric treatment. The evidence concerning an increased risk of pulmonary tuberculosis following gastrectomy is inconclusive.

Manifest Haemorrhage

At least 139 (27.9%) of the 498 patients have had at some time haematemesis or melaena during the course of their ulcer career, and, of these, 22 (15.8%) have bled on more than one occasion.

Medical Series—Remaining Patients

After subtracting those patients who have died, those who have developed gastric carcinoma, and those who have been lost, there remain 178 on which to base the late results of medical treatment (Table XII). Transient gastric symp-

TABLE XII.—Late Results in the Medical Series

	Men		Women		Total	
	No.	%	No.	%	No.	%
Recurrence requiring gastrectomy ..	46	36.5	11	21.2	57	32.0
Frequent recurrences ..	28	22.2	16	30.8	44	24.7
Occasional recurrences ..	23	18.3	12	23.1	35	19.7
No recurrences ..	29	23.0	13	25.0	42	23.6
Total ..	126		52		178	

toms have not been considered sufficient evidence of recurrence. There must have been symptoms suggestive of gastric ulcer lasting for at least several days at a time before a diagnosis of recurrence was made. Occasional recurrences have been defined as those occurring less frequently than once a year. The seven patients who have died as a direct result of the ulcer are not considered further, since there is no adequate information on the subsequent gastric history in those who died from other causes for comparison.

In three-quarters of the patients the symptoms of gastric ulcer have recurred despite the fact that these cases might be expected to be mild or of recent onset. The large number of deaths should by the end of five to twelve years have eliminated the majority of patients who were not operated on initially because of age or infirmity. Re-examination of the criteria for inclusion of patients in this series does not reveal any obvious factor in the method of selection of cases to account for the appalling results, and one is forced to conclude that medical treatment, though it may heal the ulcer, will keep it healed in less than a quarter of the early or milder cases. These findings are in accord with those of Althausen (1949) for peptic ulcer as a whole.

The cases have been analysed to see if any factors influencing the recurrence rate can be found.

Age of Patient

That the age of the patient at the time of gastroscopic diagnosis is related to the incidence of recurrence is shown in Table XIII. There is a steady increase in freedom from recurrence with increasing age. There are several possible explanations of this finding, of which the most likely is that

TABLE XIII.—Recurrence Rate in Relation to Age of Patient

Age Group (years)	Recurrences					
	None		Occasional		Frequent	
	No.	%	No.	%	No.	%
Under 50 ..	12	15.2	16	20.3	51	64.6
50–59 ..	16	28.6	11	19.6	29	51.8
60+ ..	14	32.6	8	18.6	21	48.8

many of the patients whose ulcers recur frequently will have been operated on before they reach the age of 60. In addition, the older patients will be able to rest and relax more and to pay more attention to diet, etc.

Length of History

It might be expected that those patients with short histories prior to diagnosis would respond well to treatment and relapse rarely. Table XIV indicates that although they

TABLE XIV.—Recurrence Rate in Relation to Length of History

Length of History (years)	Recurrences					
	None		Occasional		Frequent	
	No.	%	No.	%	No.	%
Under 1 ..	14	40.0	7	20.0	14	40.0
1– ..	5	9.3	13	24.1	36	66.7
5– ..	6	23.1	5	19.2	15	57.7
10– ..	3	11.1	6	22.2	18	66.7
20+ ..	11	36.7	4	13.3	15	50.0

Note: In 6 patients the length of history was unknown.

appear to do better than those with longer histories, their chances of remaining symptom-free are still under 50%. The numbers when divided into groups are small, but with a history of between one and twenty years the chances of prolonged freedom are only about one in eight. The results have been analysed in relation to both length of history and the age of the patient. Numbers are too few to yield significant results, but the trend is for patients under the age of 50 to have a higher incidence of recurrences than those over 60, no matter what the length of history. This, as mentioned above, may well be because those patients whose ulcers recur frequently are operated on before they reach an advanced age.

Diet and Alkalis

No coherent picture emerges from a study of the relationship of dieting and taking alkalis to recurrences. Some diet the whole time, some when they have pain, and the remainder never. The position may be summarized by saying that exactly 75% of those who have had no further recurrences have given up dieting, while 61.4% of those with frequent recurrences have stuck to a diet the whole time. Nearly all patients, whether they have had recurrences or not, try to avoid certain foodstuffs or other factors. Fatty foods, including fried fish, chipped potatoes, pastry, bacon, and pork are eschewed by the great majority. Other factors considered by the patients to be a cause of relapse are pickles, condiments, highly seasoned foods, tobacco, worry, and irregular meals. Since most of these are advised against in their diet sheets it is not possible to say whether they avoid them from personal experience.

The position of alkalis is even more involved. Few patients appear to take them prophylactically, but nearly all list them as giving the most immediate relief when symptoms are present. "Doctor's medicine" is usually the chief stand-by, but most take proprietary brands as well, frequently changing from one to another. Even patients who

state that they have had no further trouble keep alkalis to hand. Rest, milk, diet and regular meals, olive oil, liquid paraffin, and belladonna in various combinations were popular for ending attacks.

Most of the replies to the question of what gave the most relief were orthodox, but one man treated his recurrences by starvation, chlorodyne, and 3 pints of beer, another recommended stout, and a woman found that a little whisky taken medicinally was an excellent remedy. One patient had been "cured" by writing to a faith-healer, and two had obtained long remissions from an expensive medicine obtained from a pharmacist "specializing" in stomach troubles.

Surgical Series—Late Results

The late results in the 169 traced survivors have been assessed according to the grading of Visick (1948), which is as follows:

Grade I.—No gastric symptoms (fullness after an extra large meal is allowed).

Grade II.—No pain, mild occasional symptoms easily controlled by care. Care implies limitation of size of meal, rest, and avoidance of certain articles of diet.

Grade III.—Mild symptoms not controlled by care, slight abdominal discomfort. This grade is subdivided as follows: Grade IIIs, satisfactory (both the investigator and the patient are satisfied with the result; symptoms do not interfere with the enjoyment of life or with work); and Grade IIIsu, unsatisfactory (either the investigator or the patient is not satisfied with the result; either the symptoms or the care taken to avoid them interferes with the patient's enjoyment of life or his efficiency at work).

Grade IV.—Not improved, severe symptoms.

The results in the present series are presented in Table XV.

TABLE XV.—Chronic Gastric Ulcer: Surgical Series—Late Results

Grading	Men		Women		Total	
	No.	%	No.	%	No.	%
Grade I ..	74	52.9	11	37.9	85	50.3
Grade II ..	38	27.1	12	41.4	50	29.6
Grade IIIs ..	14	10.0	3	10.3	17	10.1
Grade IIIsu ..	9	6.4	3	10.3	12	7.1
Grade IV ..	5	3.6	—	—	5	3.0

Out of every 10 patients still alive the result has been satisfactory in 8, moderately successful in 1, and poor in 1. There is a small late operative morbidity which must be taken into account when judging the late operative results. One man died five years after partial gastrectomy following reduction of a retrograde jejunal intussusception, one woman two months afterwards following division of bands causing obstruction, and another four years later following operative procedures designed to relieve "dumping." A further three patients have been successfully operated on for obstruction due to adhesions. None of the unsatisfactory results were due to cases of recurrent ulceration following partial gastrectomy. Indeed, despite careful investigation of many post-operative cases in these years, we have been unable to find any case of proved stomal or gastric ulcer following gastrectomy for gastric ulcer. There have been several cases of iron-deficiency anaemia which have responded well to iron. In one case megaloblastic anaemia was given as a contributory cause of death. No patient has been encountered with any gross nutritional deficiencies, although many are below their best pre-operative weight.

Analysis of the late results to determine whether there are any specific factors influencing them shows that amongst the five patients in Grade IV three suffer from severe chronic bronchitis, one from angina pectoris, and the other, in whom there is no obvious associated disease, has been relieved, at any rate temporarily, since the start of this investigation by the type of gastric suspension operation described by Capper and Butler (1951). Of the twelve in Grade IIIsu three suffer from chronic bronchitis, two from cardiac disease, another from chronic sciatic pain, and a seventh

from osteoarthritis. On the evidence it would seem that the disgruntled chronic invalid is intolerant of any post-gastrectomy disability or discomfort.

The age of the patient at the time of operation makes little difference to the late results so far as gastric symptoms are concerned (Table XVI). Neither does the length of history of symptoms before operation affect the results to any significant degree.

TABLE XVI.—Late Results in Relation to Age of Patient. Surgical Series

Age at Time of Operation	Grades I, II, and IIIs		Grades IIIsu and IV	
	No.	%	No.	%
Under 40 years ..	30	93.75	2	6.25
40-49 ..	43	86.0	7	14.0
50-59 ..	58	89.2	7	10.8
60+ ..	21	95.5	1	4.5

Comparison of Late Results

Symptoms due to chronic gastric ulcer tend to be intermittent while the non-ulcer complications following surgery tend to be constant, so no exact comparison of the symptoms in the two series is possible. If Visick Grades I and II are taken as being equivalent to no recurrences in the medical series, Grade IIIs as occasional recurrences, and Grades IIIsu and IV as frequent recurrences the results shown in Table XVII are obtained.

TABLE XVII.—Chronic Gastric Ulcer: Comparison of Results in the Medical and Surgical Series

	Medical Series		Surgical Series	
	No.	%	No.	%
"No" recurrences ..	42	23.6	135	79.9
"Occasional" ..	35	19.7	17	10.1
"Frequent" ..	101	56.7	17	10.1
Total ..	178		169	

Only a quarter of the patients in the medical series, compared with over three-quarters in the surgical series, have had no further trouble. This despite the probability that the medical series contained the majority of patients whose ulcers were initially considered to be mild or of short duration.

Discussion

Absolute indications for surgery are perforation, certain cases of manifest haemorrhage, obstruction due to hour-glass deformity or pyloric stenosis, and suspicion of malignancy, which includes all ulcers on the greater curve and the majority in the pre-pyloric region. Elective surgery is advisable when there is failure to respond to medical treatment or recurrence after a previous course or courses of strict treatment.

The analysis shows that partial gastrectomy is by far the most satisfactory method available at present for the treatment of chronic gastric ulcer. Before it is advocated various factors must be considered. These include the length of history and severity of symptoms, the presence of intercurrent disease, and the operative mortalities. Early operative mortalities will depend to a large extent on local factors, but they have significantly diminished in most parts of the world since the earlier part of this series. Late operative deaths and complications will probably be fairly constant wherever the operation is performed. In the present series the late operative complications are more than counter-balanced by the late deaths directly due to the ulcer in the medical series.

On the figures in the present analysis a strong case can be made out for surgery as soon as the diagnosis is arrived at, except in those patients with very short histories and those with signs of senility or intercurrent disease, especially severe chronic bronchitis. There are few who would be prepared to operate on all such cases, and a full course of medical treatment will relieve a small proportion for at

least a number of years. Recurrence after a strict course of medical treatment should be regarded as an indication for surgery, whether or not a strict post-ulcer regime has been followed.

Summary

The case records of 498 patients with chronic gastric ulcer who were treated in the gastro-enterological clinic at St. James's Hospital, London, during the years 1940-6 inclusive are analysed. Adequate follow-up data concerning nearly all were obtained in 1952.

The patients fall into two series, the one treated medically and the other surgically. In the former there are 262 and in the latter 254 patients, 18 appearing in both series.

The criterion for inclusion was the presence of an active chronic gastric ulcer, which in the medical series must have been seen gastroscopically. Patients with additional duodenal ulcers or scars have been excluded.

The ratio of men to women was 3.5:1.

The symptoms may start at any age, most commonly after 30, the average age being 44. The average age at the time of operation in those surgically treated was in the fifties.

The sites of gastric ulcers differ greatly between men and women. In women the site of predilection is the high posterior aspect of the lesser curve, and ulcers in the pyloric antrum are exceptional. In men the distribution along the lesser curve is more even, with a maximum incidence in the mid and lower body, while 10% are situated distal to the angulus.

The results of a fractional test meal, using gruel as the stimulant, are given. The age of the patient influences the level of acidity to only a slight extent, and it is concluded that the presence of a degenerate mucosa rather than the age of the patient accounts for the findings.

A quarter of the patients in each series have subsequently died. There is no predominant cause of death.

The problem of the malignant degeneration of chronic gastric ulcers is considered. In none of those who later developed gastric carcinoma is there enough evidence to label them "ulcer-cancers," and it is concluded that if an association between gastric ulcer and gastric carcinoma exists it is due to a preference of both for the same type of degenerate mucosa.

The evidence concerning the incidence of tuberculosis following gastric resection is presented. No conclusion concerning this is reached.

In 28% of patients an incident of manifest bleeding occurred during the course of their ulcer histories. In 16% of these there was more than one episode.

In the medical series it is concluded that although treatment will nearly always heal the ulcer it will keep it healed in only a quarter of the milder or earlier cases. A quarter have symptomatic recurrences more often than once a year, and a further third have had subsequent resections performed for recurrence. Some of the factors which may influence the recurrence rates are analysed.

Three-quarters of those who have had no further trouble have given up dieting, while nearly two-thirds of those with frequent trouble have kept to a diet the whole time.

In the surgical series a very satisfactory result has been obtained in 80%, a moderately successful one in 10%, and a poor result in the remaining 10%.

A high proportion of those with poor results have some other chronic incapacitating disease, most frequently chronic bronchitis.

The choice of treatment for those presenting at hospital with a chronic gastric ulcer is discussed. It is concluded that surgery at present offers the best results, but before it is advocated certain factors, including local operative mortality figures, the severity and length of history of symptoms, and the presence of intercurrent disease, should be taken into account.

Mr. Colin Craig has very kindly allowed us to make use of his late results for patients operated on in 1946. We wish to thank the many people who co-operated in the follow-up of patients, and are grateful to the staff of St. James's Hospital for their interest and advice. We are particularly indebted to Miss Kirwin, who, in addition to secretarial duties, suggested ways and means which led to the tracing of many "lost" patients. The cost of the investigation was met by a grant from the Weir Research Fund.

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CANCER AND THE COMMUNITY*

BY

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In considering the scope of this discussion I have assumed that the Section of Preventive Medicine is not directly concerned with treatment, except in respect of diseases whose spread in the community can be reduced by early treatment of patients infective to others. This absolves me from dealing with the rather controversial questions of how far the community might be influenced to seek medical advice at an earlier stage of cancer and what effect that could have upon ultimate survival. Those aspects of the problem are important to the community and interesting to statisticians, whether in Toronto or London, but, while they may affect the fatality of cancer, they cannot, so far as we know at present, affect the incidence or prevention of the disease.

Attitudes to the Cancer Problem

Some will say that since we can do so little as yet to prevent cancer it is unrealistic to discuss it at all in this Section. Such an attitude seems generally to stem from a fixed idea that cancer is a complication of growing old, or a mode of departing from this life, which is inevitable for a proportion of people in the same sense that arteriosclerosis is inevitable, and I propose to deal with some of the misconceptions mixed up with that idea. According to my observations it is the medical people rather than the lay community who tend to the cheerless view that the best we can do is to try to

*Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Cardiff, 1953.

improve the effectiveness of treatment, and that it is futile to try to discover causes of cancer which would be capable of elimination. However, if doctors are at all happy about advances in the treatment of this disease the community certainly is not, and I sense a growing feeling of doubt whether the ordeal of treatment is worth while in many cases in order to achieve a short prolongation of life, coupled with some surprise and impatience because so little serious attempt seems to be made, apart from work on animals, to discover causes with a view to abating them. I find, for example, that, whilst only a very small percentage of people decline to furnish details about their environmental histories, many doctors are hesitant, for one reason or another, in furthering this type of research.

It is sometimes said, generally by young doctors, that cancer is of comparatively slight economic importance to the community, since it is predominantly a disease of advanced life. Comparison with tuberculosis a decade or two ago gave some justification for the view, but it is not true to-day, and it is time that error was exposed. In an address to the British Tuberculosis Association in 1948 (*Tubercle*, 1949, 30, 50) I calculated the years of future "working" life between the ages of 15 and 65 lost to the community in England and Wales through premature deaths caused by respiratory tuberculosis, cancer, and accidents in 1945. It was assumed that if the people who died of one of those causes had not done so in that year, they would have been subject from that time onwards to the ordinary risks of mortality at successive age periods as shown by the 1945 life table rates for the whole population of each sex. The future working years lost as a result of the cancer deaths was 355,000, compared with 435,000 lost through deaths by respiratory tuberculosis and 268,000 lost by fatal accidents. In view of the great fall in tuberculosis mortality since 1945 I have now repeated the whole calculation for the year 1950, using the life table for that year, and the result is shown in Table I. No account is taken of the loss through invalidity prior to death.

TABLE I.—Estimated Loss of Future Working Life Due to Cancer, Tuberculosis, and Accidents in 1950

Cause of Death in 1950	International Numbers	No. of Thousands of Person-years of Future Life Lost between 15 and 65		
		Males	Females	Total
Cancer	140-205	212	220	432
Tuberculosis, respiratory	001-008	143	125	268
Accidents	E800-962	211	61	272

The cancer total has increased from 355 to 432 thousands in the interval because the expectation of life based on 1950 death rates from all causes was much better at each age than in 1945, and because the new definition of cancer takes in leukaemia and Hodgkin's disease; this does not indicate a worsening of cancer mortality for both sexes taken together. For accidents the figure has hardly changed, owing to a balance between the reduction in deaths and the increase in normal life expectation. Accidents and cancer are now equally important for males according to this criterion, but for females cancer produces three and a half times the loss due to accidents. For respiratory tuberculosis there has been a great fall from 435 to 268 thousands, bringing the total much below that for cancer. Consequently, cancer has now become the cause of death which is of most serious economic importance when judged from

this standpoint. It is interesting to note that cancer of the lung and bronchus in 1950 contributed 65 to the 212 total for male cancer deaths, and this figure is of course increasing rapidly every year. Cancer of the stomach contributed 33 thousand years for males, so nearly half the total is due to these two forms of cancer in the case of men.

Possibilities of Reducing Cancer Incidence

Another prevalent idea among doctors, though not in the community as a whole, is that it is of little profit to talk about abatement of cancer until pathologists have established its aetiology through experiment, despite the fact that this thesis has been disproved in the history of other diseases. I was once asked by a group of demographers why we could be any more confident in predicting the future trend of the general death rates at particular ages than we are in predicting the trend of the birth rate. My reply was that whilst the latter is influenced by many conflicting desires and considerations which pull in opposing directions and are affected by the social circumstances of the time, conscious efforts to influence mortality in a free democracy are pulling all the time in the same direction, downwards, and, apart from wars, we can count on that continuing.

Furthermore, experience has shown that when the public conscience has become thoroughly aroused about deaths from a particular cause, that death rate has tended to come down whether or not the pathology was properly understood. Two decades ago no one thought that the national infant mortality rate would ever be reduced below 30 per 1,000; but world-wide interest in the problem accompanied by all-round efforts without much aid from new discoveries resulted in rates of 20 being attained by Sweden and 25 by Holland in 1950, and brought down the England and Wales rate to about 28 in 1952. About 1934 the public conscience became thoroughly aroused about maternal mortality, and the rate began to fall at once and continued to do so for years before the sulphonamides and penicillin came along and nearly finished the job. The trouble with cancer is that possibilities of abating its incidence have as yet hardly been regarded seriously except in respect of a few varieties of so-called industrial cancer whose causes are well established.

The search for connexions between human cancer and the countless chemical substances, natural and artificial, which we ingest, inhale, and absorb in the course of our normal lives has begun, however, and we really owe its inception to the observation of Percivall Pott, a surgeon at Bart's in the eighteenth century, that skin cancers of chimneysweeps arose from irritation by soot; there followed, more than a century later, proof that certain mineral oils were responsible for the epitheliomas occurring in cotton-spinners.

Chemical Promoters and Irritants

The number of different agents which have been proved to be carcinogenic to animals since Yamagiwa and Ichikawa first produced true malignant tumours by applying coal tar to the ears of rabbits in 1915 now runs into many hundreds. In 1922 Passey produced malignant growths by painting the skin of mice with an ethereal extract of soot, and in 1924-5 Kennaway was able to produce carcinogenic tars by methods which led to the conclusion that the carcinogenic agent was a complex hydrocarbon of the aromatic series. In 1927 Mayneord discovered that the carcinogenic tars and oils had a characteristic fluorescence spectrum, and Heiger then found that a chemical substance, 1:2-benzanthracene, gave such a spectrum. As a result of further intensive research Kennaway and Heiger were able to demonstrate for the first time that cancer could be produced by a pure compound 1:2:5:6-dibenzanthracene, and in 1933 Cook and Hewett synthesized 3:4-benzpyrene, a carcinogen present in pitch. More recently Berenblum and others have produced experimental evidence that after application of a

carcinogen certain non-specific irritants could determine whether or not tumours appeared and how long they took to appear.

Furthermore, it has been found that the addition of certain fats to the diet of experimental animals increases the incidence of tumours resulting from application of some carcinogens to the skin, whilst, on the other hand, hydrogenated coconut oil reduces the incidence. This work on non-specific co-carcinogens and anti-carcinogens might possibly open the way to cancer prevention on a large scale without waiting until the whole mechanism is understood. Consider the case of bladder cancer, which we know is produced with rather high frequency in men who work with certain chemicals of precisely known composition, while thousands of people who have never handled those chemicals industrially contract the same condition. Surely it is a reasonable inference that those other bladder cancers are initiated by contact in ordinary life with chemicals closely related to the known industrial carcinogens, and whether they do develop may depend on the action of some other chronic irritant. This form of cancer becomes, therefore, a problem for preventive medicine to investigate and is not merely a problem peculiar to one industry.

Statistical Research on Cancer

A third manifestation of the sceptical attitude to prevention in respect of cancer is the excuse that statistics cannot prove causation, and, since they can be made to prove almost anything, why take any notice of them? When statistics show a death rate to be falling the evidence is usually accepted without question and credit is taken for it by all who can lay claim to a part in that happy event. But if statistics show a rate to be rising for a particular disease it is at once objected that medical certification or changing the fashion in nomenclature made the figures fallacious. The persistence of the old joke about statistics proving anything is convenient, because when statisticians arrive at unpalatable conclusions it can be said that so long as the evidence is solely statistical nothing need be done except wait for "real," that is to say experimental, evidence. If many thousands of people are dying annually from a disease and statistical evidence indicates that the probability is very high that the main cause lies in an article X, it is hardly sensible to sit back and wait, maybe 20 years, for the experimental evidence. Indeed, unequivocal evidence may never be obtained in a case of a disease which takes a very long time to develop in man after application of an irritant or of an initiator. In such a case the responsibility of advising the community is a serious one, and it is idle to suppose it can be evaded by pretending that statistical evidence alone is of no account.

We are faced with such a situation to-day in regard to lung cancer and tobacco-smoking, and, whilst it is fortunate that tobacco is not a necessity of life, the position is complicated by considerations of finance. In my opinion the proper course is to intensify research on the question from every aspect, and meanwhile inform the community of the statistical findings (as indeed has already been done by the B.B.C.), and say what the risk amounts to if what is suspected is correct, so that each individual can decide for himself or herself whether to take the risk or not. Although statistical studies alone may establish the existence of a real connexion between a factor X and a disease Y without revealing the precise reason for that connexion, the probability that in the absence of X there could be a great reduction in Y may be indicated as so high that some may consider that the use of X involves an amount of risk which it is unwise to take.

Whatever may be the final outcome of the tobacco question, cancer of the lung has now come into the field of preventive medicine. Non-smokers can get the disease and the statistics of deaths suggest that smoke from domestic chimneys may be a factor, so the problem to be solved is whether it arises through inhaling or ingesting carcinogenic or co-carcinogenic substances derived from coal or mineral

oil or used in the cultivation or manufacture of tobacco. Perhaps an initiator is present in one of these and a non-specific irritant in another, and statistical studies now in progress may help to answer this question.

Cancers of the oesophagus and larynx are more frequent amongst men in occupations associated with excessive drinking of alcohol, but there are other factors involved, and the sexes are differently affected. Cancers of the cervix uteri on the one hand and of the breast and ovary on the other are associated in opposite ways with marital history. For these and other kinds of cancer, statistics have indicated that environmental factors have some influence on incidence.

Incidence of Cancer of the Stomach

In the case of stomach cancer incidence is closely related to social and urban environment, and it shows other peculiar local variations for which no explanation has yet been found. Death rates in 1921-30 attributed to this cause showed considerable excess in London and aggregates of large towns at early ages, but the excess was not so pronounced after 65. Standardized comparative figures for years 1947-9, based upon the mortality expected by applying age-specific rates for all rural districts of England and Wales to the populations, are shown in Table II.

TABLE II.—Comparative Mortality Figures for Cancer of Stomach in Certain Large Towns in 1947-9 (With Rates for All Rural Districts of England and Wales as Base)

	Males			Females		
	15-	45-	65+	15-	45-	65+
Liverpool	185	156	144	175	128	131
Manchester	218	158	132	124	151	123
London county	155	114	101	135	109	106
Outer ring of Greater London	133	97	97	112	91	100
Birmingham	130	125	120	155	125	116
All rural districts	100	100	100	100	100	100

There has been no diminution of the urban excess previously noted. It is very pronounced in Liverpool and Manchester, and is also considerable in Birmingham, at every age amongst both men and women. In London the excess is evident only at the younger ages, and rates are higher at each age in the centre than in the outer ring. This suggests that some carcinogenic or co-carcinogenic substance, which might be ingested or inhaled in the first instance, is more often encountered in large towns than in rural areas; but we also know that certain rural areas present a large and at present inexplicable excess of mortality compared with other rural districts. I refer particularly to the counties of Wales which touch the sea coast, and will confine attention to the five in North Wales which are now being studied by the Cheshire and North Wales Branch of the British Empire Cancer Campaign with the help of the medical officers of health, the Liverpool and Welsh Regional Hospital Boards, and the University College of North Wales. Comparative indices for cancer of the stomach and breast in North Wales during the 29 years from 1921 to 1949, based as before on the mortality expected from rates in all rural districts at decennial age groups, are shown in Table III. The North Wales counties included are Anglesey, Caernarvon, Denbigh, Flint, and Merioneth; the West Midland group comprises Gloucester, Stafford, Warwick, and Worcester; and the South-east group consists of Kent, Surrey, Sussex East, and Sussex West. In this table, and also in Table II, duodenum is included with stomach.

North Wales showed a rural mortality attributed to stomach cancer about twice the national average at ages under 65, and about 1.8 times the average at ages over 65. Dividing into two periods 1921-39 and 1940-9, the excess is seen to have become only slightly less in the second than in the first period. Cheshire and Lancashire rural districts produced average rates, whilst the West Midland rates were about 11% below the national level, and the South-east

TABLE III.—Comparative Mortality Figures for Cancer of Stomach and Breast in 1921-49 in Aggregates of Rural Districts of North Wales and Parts of England (With Rates for All Rural Districts as Base)

Rural Districts of	Stomach				Breast	
	Males		Females		Females	
	15-	65+	15-	65+	15-	65+
North Wales { 1921-39 ..	184	173	224	203	95	91
{ 1940-49 ..	177	165	210	173	97	95
{ 1921-49 ..	182	169	220	192	96	93
Cheshire and Lancashire, 1921-49	101	97	99	104	95	101
West Midlands, 1921-49 ..	89	89	86	89	105	106
South-east, 1921-49 ..	81	83	73	76	105	100
All England and Wales ..	100	100	100	100	100	100

county rates were around 20% below. By way of contrast, breast cancer mortality in the 29 years showed no important differences between these areas, that in North Wales being 5% below average, and that in the West Midlands 5% above.

Justification for Research into Environmental Factors

Suggestions have been made that doctors in Wales tend to certify cancer of the stomach as the cause of death whenever haematemesis or obscure gastric symptoms make it seem feasible, and often with insufficient justification. No evidence that such a practice is in fact more prevalent in Welsh than in English rural areas has been produced. The relative excess is smaller at ages over 65 than in mid-life; and no compensating deficiency can be found in the group of deaths attributed to those conditions likely to be mistaken for gastric cancer, such as peptic ulcer, cancer of the liver, pancreas, and colon, other diseases of the stomach, and pernicious anaemia. Inquiries from a first sample of 100 certifiers of deaths said to be due to stomach cancer in North Wales show that there was necropsy, biopsy, operation, or x-ray evidence for 50%, compared with 65% of 100 deaths so certified in rural districts of Cheshire and Lancashire, and about 60% in the large towns other than Liverpool. If half the cases in which the diagnosis is unsupported by any of these tests are rejected, the North Wales rates would be reduced by a quarter and the Cheshire-Lancashire rates by a sixth, correcting the ratio between them to 1.8 at ages under 65 and 1.6 at ages over 65.

These preliminary statistical tests justify the Cheshire and North Wales Branch of the British Empire Cancer Campaign in their belief that there exists a real phenomenon to be explained, and in their determination to investigate race and residence, work and workplace, soil, air, and water, food, drink, and every conceivable vehicle of carcinogenic substances, or co-carcinogenic irritants. With this line of approach the community of the research area seem to be very much in sympathy. It is something they can understand and welcome because it holds out some hope of prevention, which from the patients' standpoint would be so much better than cure by surgery or radiation, no matter how skilful or high-powered that may be.

Contribution of Medical Officers of Health to Environmental Studies

At the International Conference in London in 1928, organized by the British Empire Cancer Campaign, Sir George Buchanan gave an address on "Collective Public Effort in Dealing with Cancer," which after 25 years is still very pertinent to the discussion to-day. Speaking of municipal work, he said: "The principle to be followed . . . is to secure the closest possible common action between the municipal health department and the authorities of the general and poor-law hospitals, the university if there is one, the voluntary agencies which support social work, and especially the staffs of hospitals and the medical practitioners as well as the local work of the B.E.C.C. where it is in operation. It is no part of the programme that municipal direction should

be made prominent; it is enough for the health department if it can help. Where the medical officer of health is wanted to take the initiative he will do so; otherwise he is content to be one of the cogs on a useful working wheel. Personally, I may express the view that cancer research has much to gain through his instrumentality. . . ."

I would like to take this opportunity of expressing my profound appreciation of the way in which the medical officers of health of the region in which I am working are, together with their assistants, helping the British Empire Cancer Campaign in just that spirit.

Sir John Robertson, at that time medical officer of health of Birmingham, uttered at the same conference some words on which I will close. "Inquiry by the health authority into the facts surrounding each death from cancer has as much value from an educational point of view as it has from an aetiological." How true this is we are finding out in the study I have referred to; education of surgeons, physicians, radiologists, and health officers about the essential gravity of cancer as a community problem is proceeding as a result of the inquiries in progress, and later it may even penetrate to the university. Whether the scientific results we hope for materialize or not, by such education the community will benefit eventually.

CANCER AND THE COMMUNITY*

BY

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The control of cancer is a world problem and one of the big challenges of the present day. Its magnitude requires an all-out effort to reach a solution. With our present knowledge of the disease a great deal can be done to help, but we must not be satisfied until it is under complete control. The object of this paper is to indicate the effects of cancer on the community and the ways in which the latter can co-operate in the fight for its mastery.

Effects of Cancer on the Community

These are of such severity that the disease can be described as one of the greatest scourges of mankind.

World Mortality.—The death rate from cancer varies in different countries, and the figures shown in the Table were published by the World Health Organization in 1951.

Deaths from Cancer by Country per 100,000 Population

Country	Males	Females
United Kingdom (1950)	205.8	184.0
France (1950)	175.8	169.5
Northern Ireland (1951)	161.3	145.1
Netherlands (1951)	151.4	147.2
U.S.A. (1949)	141.1	136.4
Canada (1950)	129.7	123.1
Israel (1951)	85.5	105.5
Japan (1950)	80.1	74.9

National Mortality.—Reference to the Registrar-General's Statistical Review of England and Wales for 1950 showed that 87,274 persons died from neoplasms, as compared with 72,613 in 1940. During this decade the death rate has fallen considerably from acute infec-

*Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Cardiff, 1953.

tive and parasitic diseases, tuberculosis, rheumatism, and respiratory diseases as a result of early diagnosis and advances in treatment, in which antibiotics have played an important part. Workers in public health and preventive medicine have made a big contribution in these and other fields, but the cancer situation remains serious in that the number of deaths in this decade has risen by 14,661 and only cardiovascular disease has a higher national mortality. It is not without significance that the greatest number of deaths are caused by cancer of the alimentary tract, especially of the stomach and colon, and these are rising. If the two conveying tubes, the oesophagus and the rectum, are compared, deaths from cancer are nearly three times greater in the latter organ.

Family and Individual Problems.—About half the total deaths from cancer occur in persons between 45 and 65, when their family and business responsibilities are greatest. The large number of children who die annually from cancer and allied diseases should also be remembered. The development of cancer is one of the worst events that can overtake us, for it means either a major operation, a course of radiotherapy, or both, and the subsequent rehabilitation may take a long time, with necessary follow-up examinations at regular intervals. Life may be resumed with a colostomy or tracheostomy, and when the disease is more advanced plans must be made for a chronic illness with all its repercussions on the life of the family. These things are brought out in the report of the Joint National Survey Committee (1952), of which I was chairman.

The present situation regarding mortality and morbidity is serious, and everything possible must be done to rectify it.

Control of Cancer.—The joint endeavours of the clinical and laboratory workers which are applied to gain this final objective can be considered as a five-point programme. Every member of the community has a responsible part to play.

Research into Causation

Studies concerning animal cancer in the laboratories have brought to light a number of genetic, physical, and chemical factors which cause malignancy. They have also been identified with human cancer; for instance, in the development of certain occupational and industrial forms of the disease exogenous physical and chemical carcinogens are recognized. It is also possible that some spontaneous varieties of cancer may be caused by other unrecognized carcinogens, either exogenous or endogenous, for which a determined search is desirable. Clues might come from a careful scrutiny of the environment and habits of people of various nations, for it is known that the incidence of the disease varies with race, country, and economic status. A more rigorous search for carcinogenic substances should be made in the tissues of patients with various forms of cancer, and it must be remembered that their action may be additive.

There is scope for increasing the amount of clinical research in the wards and of study of carefully compiled clinical records of astute observers. Obvious advantages would be gained by drawing clinical and laboratory workers closer together so that they could discuss their problems and share ideas. It should not be overlooked that some of the fundamental facts in cancer research were contributed by clinicians; for example, our knowledge of chemical carcinogens was built upon the observation of Percivall Pott that cancer of the skin of the scrotum was common in chimney-sweeps. Fundamental planned research in the laboratories concerning the nature of the cancerous change in normal

cells is a long-term project, but in the meantime there are many other problems to tackle whose solution may throw considerable light on the subject.

Prevention of Cancer

The community must recognize that certain varieties of cancer are preventable if the appropriate action is taken. Were further research to reveal that common types of the disease are caused by exogenous carcinogens it would be possible to gain considerable control by their elimination alone.

Precancerous Lesions.—A number of these conditions are well recognized, and more precise information is required regarding their frequency in the community and the degree of increased risk which they entail. These facts would be taken into account in the assessment of the need for cancer-detection centres where precancerous lesions could be dealt with. The association of this work with the prevention of cancer is obvious, and a few examples will suffice. A benign tumour such as an adenoma of the colon or rectum, a papilloma of the urinary bladder, or a duct papilloma or fibro-adenoma of the breast is carefully removed. If a benign melanoma is in a position where it might be injured it should be excised. Patients with familial polyposis of the colon and rectum develop cancer at a relatively early age, and the affected part should be removed before this occurs. Cancer is likely to develop in the colon affected by long-standing ulcerative colitis, so total colectomy is being performed more often in these patients. The association of oral sepsis, syphilis, and leucoplakia with cancer of the mouth has been recognized for a long time, and the incidence of this form of the disease will diminish by their timely treatment.

Cancer and Industry.—Workers in certain industries are exposed to carcinogenic substances which affect the skin and other parts of the body. The effects of mineral oils and tar are well known, and more recently benzidine and β -naphthylamine, used for making dyestuffs, have proved to be dangerous chemicals. Prevention of cancer in these industrial workers includes the isolation and separation of carcinogenic substances from the materials used by them, thus giving a complete safeguard. In the meantime the provision of protective appliances for the skin, adequate washing accommodation, good ventilation of factories, and the formation of regulations for the guidance of workers are of obvious importance.

Lung Cancer and Cigarettes.—As a result of the careful work by Doll and Bradford Hill we can say that cigarette-smoking is a potentially dangerous pursuit, and before starting the habit people should weigh up the increased risk of developing lung cancer in middle and later life. More investigations are necessary to see whether a carcinogen can be isolated from cigarette tobacco.

Lung Cancer and Atmosphere Pollution.—The high death rate from respiratory diseases in residents of the industrial centres of the country has been recognized for many years, and was emphasized during the great fog of London in the winter of 1952. It has been suggested that the continuous exposure of persons to a carcinogen in the atmosphere such as benzpyrene lowers the resistance threshold of the lung to cancer in cigarette smokers. More work is required concerning local atmospheric pollution in the neighbourhood of gasworks and its effects on the respiratory system.

Early Diagnosis and Treatment

The best chance for a patient with cancer lies in early diagnosis and efficient treatment, and my experience proves that it can be cured in many patients. The community has a special responsibility to report to the doctor when any disturbance in health occurs lasting more than a few days. Conditions other than cancer may be the cause of this, and by timely treatment they can be rectified. Some may hesitate to go to the doctor because they fear cancer, so by

wise teaching we must help them to conquer it. Progress is being made in the treatment of cancer, and people can take courage and find new hope. The present methods available include surgery, radiotherapy, chemotherapy, and combinations of these treatments.

Surgery, helped by advances in anaesthesia and antibiotics, has been extended to a number of organs, and radical operations for cancer of the oropharynx and hypopharynx, oesophagus, and lung can now be performed with a great measure of safety. Other operations have become more radical, thus increasing the percentage of operability and survival rates; these include resection of the stomach, colon, and rectum. Radiotherapy, alone or combined with surgery, has made a valuable contribution, especially in cancer of the skin, breast, cervix uteri, and larynx. Radioactive isotopes are helpful in cancer of the bladder and thyroid. Much work is also being done in chemotherapy to find substances to control cancer. Oestrogens retard the growth of cancer of the prostate or inactivate it; when the disease is advanced and the patient has been treated by castration and oestrogens, adrenalectomy may help further. A number of women with cancer of the breast are helped by the withdrawal of oestrogens by oophorectomy or the administration of androgens. I have known several of these patients with advanced cancer live normally for a number of years without any pain.

Rehabilitation of the Patients after Treatment

Following treatment the general condition of patients is usually lowered together with the ability to work. Hospital treatment is unnecessary, but they are not fit enough to go home; this interval must be bridged by convalescent treatment. Homes are therefore necessary for them which are staffed by those who are trained for this special work. The treatment includes rebuilding the patient's nutritional state, correcting any blood deficiency, restoring muscle tone and development. A colostomy or tracheostomy may be present, and patients may require instruction in their management. Following laryngectomy or laryngo-pharyngectomy speech therapy is necessary. Other patients may have an amputation stump which requires attention, together with instruction concerning wearing an artificial limb. Patients must also have an opportunity to reorientate their general outlook, and this programme of treatment requires several weeks to complete.

Care of Patients with Persistent Cancer

At present this is a big problem, but it is hoped that it will diminish in the future as a result of earlier diagnosis and treatment. Many of these patients are nursed at home and much help is required for them and their relatives. This was shown in the national survey report, where a description is given of how this can be done. Special assistance is available from organizations such as the Marie Curie Memorial Foundation and the National Society for Cancer Relief. There are homes where many can be given all the care and treatment required; some can go temporarily so that the family can have a rest. The maintenance of the general health, the nutritional state, and the condition of the blood are important in improving the patient's resistance to the disease. Modern methods for the relief of pain, palliative radiotherapy, and chemotherapy have proved valuable in certain circumstances. These patients often face a long illness, so care is taken to avoid despondency; much can be done to help them, and no impression must ever be given that treatment has ceased.

Cancer Education for the Public

It is clear that the community has its responsibilities in this programme for cancer control, chiefly in connexion with the prevention and early diagnosis of the disease. Before people can play their part they must be advised about

the steps they can take under certain conditions in a way which will gain their confidence.

In 1804 an attempt was made to give people information on this subject, but the mails were so slow that the patients died before it reached them. Since that time a number of surgeons have stressed the need for this work. For example, in 1900, when Wertheim introduced his operation for radical removal of the uterus, a movement was started in Germany to educate women to recognize the early symptoms of cancer of the cervix uteri. The Marie Curie Memorial Foundation has a plan to carry out cancer education on a national scale. The object is to substitute intelligence and optimism for ignorance and fear. It is not enough to tell people what are the early symptoms of cancer; they should also be told how to act in certain circumstances and what can be done to help them. It is recognized that this must be done wisely and by stages until the whole population is eventually covered. An important approach to the public is through the medical officers of health, and already a number have set up education committees to deal with the work. These committees should be expanded to cover the country, and in the first place information given to specified groups, including the district nurses, who number 13,000 in England and Scotland; health visitors, numbering about 6,000; and student nurses, numbering 50,000. The education scheme should also embrace all the social and welfare workers, and by this means a nucleus of informed people will be created through whom the facts can reach the population. Expansion will occur by degrees by taking in other sections until the whole country is covered.

Methods of Teaching

Use of Leaflets.—A series of 12 leaflets setting out the early symptoms of cancer in the chief sites of the body, together with notes on its prevention and treatment, is available at the Marie Curie Memorial Foundation to medical officers of health and others on request for careful distribution.

Lectures and Films.—Groups of people are invited to lectures on cancer which are illustrated by lantern slides, and educational films are shown. Experience shows that these are well attended, and excellent discussions follow the lectures. Special lectures are also given to members of the nursing profession in refresher courses, and, in addition, arrangements are made for groups of district nurses to attend at a cancer clinic so that they can see the results of modern diagnosis and treatment. Talks on the radio can also be developed, and these will reach a large section of the community.

Publications.—Periodically, articles on various aspects of cancer are published for nurses and health visitors to help them in their work. In addition, simple articles published in the lay press are of value to the public.

Presentation.—The subject must be presented in simple language which is easily understood and designed to develop an optimistic outlook and confidence. A complete picture is given, including information on the nature of the disease, the way by which it may be prevented, the early symptom and signs, and what can be done for the patients. The latter includes the help which is available from the various organizations working in this field.

Summary

The effects of cancer on the community are described with special reference to world and national mortality together with family and individual problems. It is shown that the present situation is serious as regard mortality and morbidity. A five-point programme for the control of cancer is described and the part the community can play is shown. An outline of a scheme for cancer education of the public is given.

MODIFIED COURSE OF T. CONGOLENS INFECTION IN MICE GIVEN DIETS WITH MILK CASEIN*

BY

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TABLE I.—Composition (g. per 100 g.) of Diets Tested

Diet 1		Diets 2, 3, and 4			
		2	3	4	
Wheat, whole ground	50	Casein (lactic, un-			
Barley, whole ground	25	extracted; Glaxo			
White-fish meal	7	Labs.)	30	20	10
Meat-and-bone meal	6	Maize starch	61	71	81
Dried brewers' yeast	5	Margarine*			3.0
Dried grass meal	5	Cod-liver oil			0.5
Cod-liver oil	1	Salt mixture†			4.0
Common salt (sodium chloride)	1	Dried yeast powder			1.5
Total	100	Totals	100	100	100

* Ministry of Food special margarine containing 450–550 I.U. vitamin A per oz. and 90 I.U. vitamin D per oz.

† McCollum's salt mixture No. 185 with iron and potassium iodide (0.221 g. per kg.).

Experiment I

Young white Swiss female mice of about 6 weeks of age of the laboratory inbred strain, which had been bred and reared on diet 1, were allocated to one or other of diets 1 to 4, on which they were fed for three weeks before inoculation, and thereafter throughout the course of the experiment. Twenty mice were allocated to each group. The mice were kept in individual glass jars with sawdust litter, which was changed weekly, and with individual water-bottles. The "casein" diets were made up in bulk and kept in the refrigerator. Each mouse was given 5 g. of diet daily.

The inoculum was a 10% mixture in saline of blood at "acme" (see below) from four mice infected with *T. congolense* (Busimbi); 0.5 ml. was injected into each mouse subcutaneously. It may be explained that for over five years in this laboratory *T. congolense* (Busimbi strain) remained fully virulent for mice. The strain was maintained by passage to fresh mice whenever the number of trypanosomes in the blood of an infected mouse first became uncountable. This phase is known as "acme" and the strain derived thereby as an acme strain (Browning, Calver, and Adamson, 1948). The usual course of infection in a previously uninoculated animal is that small numbers of trypanosomes appear in the blood in three to six days, and increase rapidly until acme is reached (five to nine days). Parasitaemia persists up to a week thereafter (acute phase); then

In February, 1952, mice which had been fed on diets with different amounts of milk casein as protein were inoculated with *Trypanosoma congolense* (Busimbi strain). Contrary to expectation, blood films from the animals failed to reveal trypanosomes and the mice did not die. This phenomenon was so unexpected that it was further studied with a range of diets as described in this paper. The results of two further experiments confirmed the original observation and showed that the unexpected result might be attributed to a change of diet.

In the absence of fuller investigation the results were not published. However, since they show a close analogy with the findings of Maegraith, Deegan, and Jones (1952) of the suppression of *Plasmodium berghei* infection in rats fed on milk diets, it now seems desirable to give a brief account of the experiments with trypanosomes.

Five diets were tested: (1) Rowett Research Institute Stock Diet No. 86 (Howie, 1951). This is a cubed diet of a mixture of natural foods giving good growth and breeding performance. (2) Diet containing 30% casein. (3) Diet containing 20% casein. (4) Diet containing 10% casein. (5) Stock diet of bread soaked in milk daily, with a handful of oats weekly. The percentage composition of diets 1–4 is given in Table I.

* This work was done with a grant from the Medical Research Council.

TABLE II.—Diet 1 (Stock Diet 86, Rowett Research Institute). Results of Infecting Mice with *Trypanosomes*

No. of Days After Inoculation	Mouse Numbers																			
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
4	—	—	—	+vl	+vl	—	—	—	—	—	—	—	+vl	—	—	—	—	+vl	—	—
5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
14	Dead	—	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
33	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
34	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
35	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
36	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
37	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
38	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
40	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

— to +++ = range of numbers of trypanosomes in blood (see text, p. 854). 1 = little; vl = very little.

trypanosomes disappear for about seven days, but reappear in the blood in large numbers and persist as a rule until the death of the animal (chronic phase). Death may take place in the acute phase or in the chronic phase. Animals may survive up to about four months after inoculation, but usually die much before that time.

In the present experiments the blood of each mouse was examined daily by pressing out a drop of blood between a cover-slip and slide and examining a wet film under the $\frac{1}{4}$ -in. (4-mm.) lens of the microscope. In recording the results of blood examination, the numbers of trypanosomes per microscope field were indicated in the following way :

-	=No trypanosomes seen after three minutes' search
+v	=1 trypanosome in over 2 fields
+l	=1 trypanosome in 1-2 fields
+	=1-3 trypanosomes per field
++	=3-15 " " "
+++	=Over 15 " " "

TABLE III.—Diet 2 (30% Casein). Results of Infecting Mice with Trypanosomes

No. of Days After Inoculation	Mouse Numbers																			
	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	+vl	-	-	-	-	+vl	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	+l	-	-	-	-	-	-	-	-	-	-	-	+vl	-	-	-	-	-
7	-	-	+	-	-	-	-	+l	-	-	-	-	-	-	+l	-	-	-	-	-
9	-	-	+++	-	-	-	-	+	-	-	-	-	+vl	-	-	+	-	-	-	-
10	-	-	+++	-	-	-	-	-	-	-	-	-	+++	-	-	+++	-	-	-	-
11	-	-	+	-	-	-	-	-	-	-	-	+	+++	-	-	+++	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	+++	-	-	+++	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Dead	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	++	-	+	+++	-	-	++	-	-	-	-	-	-	-	-	-	-	-
17	-	-	+++	-	+++	+++	-	-	+++	-	-	-	+l	-	-	-	-	-	-	-
18	-	-	+++	-	+++	+++	-	+	+++	+l	+	-	+++	-	-	-	-	-	-	-
19	-	-	+++	-	+++	+++	-	+++	+++	-	-	-	+++	-	-	-	-	-	-	-
20	-	-	+++	-	+++	+++	-	+++	+++	-	-	-	+++	-	-	-	-	-	-	-
21	-	-	Dead	-	-	-	-	Dead	-	-	-	-	+++	-	+vl	-	-	-	-	-
23	-	-	-	-	-	-	-	+++	-	-	-	-	+++	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	+++	-	-	-	-	+++	-	-	-	-	-	-	-
25	-	-	-	-	+l	+vl	-	+++	-	+vl	-	-	Dead	-	-	-	-	-	-	-
26	-	-	-	-	++	+++	-	+++	-	+++	+l	+vl	-	-	-	-	-	-	-	-
27	-	-	-	-	+++	+++	-	Dead	-	+++	+++	+++	-	-	-	-	-	+l	-	+
29	-	-	-	-	Dead	+++	-	-	-	+++	+++	Dead	-	-	-	-	-	-	-	-
30	-	-	-	-	-	+++	-	-	-	+++	+++	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	+++	-	-	-	+++	+++	-	-	+vl	-	-	-	-	-	-
32	-	-	-	-	-	+++	-	-	-	Dead	+++	-	-	-	-	-	-	+l	-	-
33	-	-	-	-	-	+++	-	-	-	-	+++	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	+++	-	-	-	-	+++	-	-	-	-	-	-	++	+	-
35	-	-	-	-	-	+++	-	-	-	-	+++	-	-	-	-	-	-	+++	+	-
37	-	-	-	-	-	Dead	-	-	-	-	+++	-	-	-	+++	-	-	+++	-	-
38	-	-	-	-	-	-	-	-	-	-	+++	-	-	-	+++	-	-	+++	-	+l
40	-	-	-	-	-	-	-	-	-	-	Dead	-	-	+++	+++	-	-	+++	-	+++

TABLE IV.—Diet 3 (20% Casein). Results of Infecting Mice with Trypanosomes

[illegible]

-- to +++ = range of numbers of trypanosomes in blood (see text, above). l = little; vl = very little.

Results

The results of daily blood examinations are given in Tables II to V. All the mice fed on the four different diets ate their food well and showed no signs of ill-health, having smooth sleek coats and gaining weight throughout the experiment until such time as those which died of the infections were actually dying. The weights of uninfected mice given diets 1 to 4 are shown in Table X.

Diet 1 (see Table II).—Trypanosomes first appeared in the blood (+v, +1, +) of the animals of this dietary group four to six days after inoculation. They reached acme (+++) in six to nine days and persisted in numbers till 11 to 17 days after infection. Trypanosomes were absent from the blood for two to six days. Thereafter the infection, now chronic, continued with more or less constant numbers of trypanosomes in the blood until death or termination of

TABLE V.—Diet 4 (10% Casein). Results of Infecting Mice with Trypanosomes

No. of Days After Inoculation	Mouse Numbers																			
	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
4	-	-	-	-	-	-	+1	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	++	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	+++	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	+++	-	-	-	-	-	-	-	-	-	-	-	-	-
9	+	+1	-	+1	-	+1	+++ Dead	-	+1	+	+v1	-	-	+	-	-	-	+1	-	-
10	-	-	-	+++ Dead	-	-	+++ Dead	-	-	+++	+	-	-	+++	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	+++ Dead	-	-	-	+++	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	+++	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	+++	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	-	+++ Dead	-	-	-	-	-	-
16	+v1	+v1	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+++	-
17	+1	++	-	-	+1	-	-	+1	-	-	-	-	+++	-	-	-	-	+++	+++	-
18	-	+++	-	-	-	-	-	-	-	-	-	-	+++	-	-	-	-	+++	+++	-
19	-	+++	-	-	-	-	-	++	-	-	-	-	+++	-	+v1	-	-	+++	+++	-
20	-	+++	-	-	-	-	-	+++	-	-	-	-	+++	-	+++	-	-	+++	+++	-
21	-	+++	-	-	-	-	-	+++	-	-	-	-	+++	-	+++	-	-	+++	+++	-
23	-	+++ Dead	-	-	-	-	-	+++	-	-	+1	-	+++	-	+++ Dead	-	-	+++	+++	-
24	-	-	-	-	-	-	-	+++	-	-	-	-	+++	-	-	-	-	+++	+++	-
25	+v1	-	-	-	+v1	-	-	+++	-	-	-	-	+++ Dead	-	-	+v1	-	+++	+++	-
26	++	-	-	-	++	+v1	-	+++	+v1	-	-	-	-	-	-	-	-	+++	+++	-
27	+++	-	-	-	+++	+	-	+++	+	-	-	-	-	-	-	-	-	+++	+++	-
29	+++	-	-	-	+++	+	-	+++	+++	-	-	-	-	-	-	-	-	+++	+++	-
30	+++	-	-	-	+++ Dead	-	-	+++	+++	-	-	-	-	-	-	-	-	+++	+++	-
31	+++	-	-	-	-	+++	-	+++	+++	-	+v1	-	-	-	-	-	-	+++	+++	-
32	+++	-	-	-	-	+++	-	+++	+++	-	+++	-	-	-	-	-	-	+++	+++	-
33	+++	-	-	-	-	+++	-	+++	+++	-	+++	-	-	-	-	-	-	+++	+++	-
34	+++ Dead	-	-	-	-	+++	-	+++	+++	-	+++ Dead	-	-	-	-	-	-	+++	+++	-
35	-	-	-	-	-	+++	-	+++	+++	-	-	-	-	-	-	+v1	-	+++	+++	-
37	-	-	-	-	-	+++	-	+++	+++	-	-	-	-	-	-	+++	-	+++	+++	-
38	-	-	-	-	-	+++	-	+++	+++	-	-	-	-	-	-	+++	-	+++	+++	-
40	-	-	-	-	-	+++	-	+++	+++	-	-	-	-	-	-	-	-	+++	+++	-

- to +++ = range of numbers of trypanosomes in blood (see text, p. 85). l = little; vl = very little.

the experiment. All animals were successfully infected. During the 40-day period of observation three mice died at the acute stage and four at the chronic stage of the infection—that is, 7 out of 20 died.

Diet 2 (see Table III).—Trypanosomes first appeared in the blood of 5 of the 20 mice in five to seven days, and of these only three showed the normal course of increase to +++ with relapse or death at the acute stage. Of the remaining 15 mice, six did not at any time show evidence of infection in the blood, and in the other nine the first demonstrated appearance of trypanosomes was from 10 to 26 days after inoculation. In 7 of the 20 mice, trypanosomes in very small numbers appeared in the blood for a very short time, sometimes on more than one occasion, before they reached +++, after which the course of persistent chronic infection always followed till death. During the 40 days 10 of the 20 mice died of infection—only one of these died at the acute stage—and one mouse (No. 127) died of intercurrent infection. The five mice in which trypanosomes had not been demonstrated were reinoculated from a fresh mouse of the acme passage strain, and their blood was examined for a further 15 days, during which time no sign of infection was observed.

Diet 3 (see Table IV).—One mouse (No. 158) died of intercurrent infection at the beginning of the experiment. Five of the 19 mice showed trypanosomes in the blood from six to nine days after inoculation; of these only two increased to +++ at this stage. Of the remaining mice, eight showed trypanosomes in 16 to 32 days, but only four of the eight ever showed a +++ infection or reached the

TABLE VI.—Summary of Data from Tables II-V

Dietary Group (20 Mice in Each Group)	No. of Mice Showing Trypanosomes in Blood Within 9 Days	+ + + Reaching 9 Days	No. of Deaths			Total	No. of Mice in Which Trypanosomes Were Not Demonstrated in the Blood	No. of Mice in Which Trypanosomes were Seen but did not Reach + + + Level
			At "Acute" Stage	At "Chronic" Stage (Up to 40 Days)				
1	20	20	3	4	7	0	0	
2	5	3	1	9	10	5	0	
3	5	2	2	5	7	6	4	
4	10	4	4	10	14	4	0	

* One of the mice given diet 3 died of intercurrent infection at the start of the experiment.

chronic phase—that is, four mice showed trypanosomes but never at the level of + + +. In 6 of the 19 mice, trypanosomes were not demonstrated. These animals also were reinoculated as described before, but no resulting infection was seen. Seven of the 19 mice died during the 40 days, two at the acute stage.

Diet 4 (see Table V).—Ten of 20 mice showed trypanosomes in the blood in four to nine days, four reached the +++ level and died at the acute stage. Six further mice showed trypanosomes after 16 to 26 days, all of these mice eventually showing 2 +++ infection which became chronic. In four mice trypanosomes were not demonstrated, and these were reinoculated as before. Trypanosomes were not seen after reinoculation. In this group there were 14 deaths—four at the acute and 10 at the chronic stage of infection.

The results of experiment I are summarized in Table VI.

Experiment II

This experiment was done with diet 1, diet 3, and diet 5, which consisted of bread, milk, and oats. Diet 5 was that used for trypanosome-infected mice in this department for many years.

Details of inoculation and blood examination were similar to those in Experiment I. Male mice of the laboratory inbred strain 3-4 months of age were allocated to the three diets, on which they were fed for a period of two weeks before inoculation with *T. congolense* (Busimbi). The period of observation after inoculation was only 23 days in this experiment.

Results

Diet 1 (see Table VII).—Trypanosomes first appeared in the blood of infected animals in four to eight days after inoculation. Acme was reached at 6 to 10 days. The trypanosomes disappeared from the blood on the eleventh to the fifteenth day after inoculation and reappeared in four to nine days after disappearance. All the animals became infected. One mouse died at the acute stage of the infection, but 9 of 10 mice survived to the chronic stage, at which all remained well till the end of the experiment.

Diet 3 (see Table VIII).—In this group only 2 of 10 mice showed trypanosomes in blood films in six to seven days. Of these two, one had demonstrable numbers of

trypanosomes on only one day of examination, while the other, in which trypanosomes persisted over three days, did not reach acme.

Diet 5 (see Table IX).—Trypanosomes first appeared in the blood of animals in this group five to seven days after infection. Acme was reached at seven to eight days. All the animals became infected. Trypanosomes persisted in large numbers in the blood for as long as 18 days after inoculation, when they disappeared for up to five days. Four mice died at the acute stage, but there were no deaths at the chronic stage in this period of observation.

Discussion

In Experiment I all the animals in the group fed on diet 1 followed the course of infection normally observed in this

laboratory with *T. congolense* (Busimbi) (see Table II). The results of the infection in mice given diets 2, 3, and 4, on the other hand, repeated the unexpected result referred to in the introduction of many failures to infect in the normal manner with this strain. Only 5 out of 20 mice on each of diets 2 and 3 and 10 of 20 mice on diet 4 showed trypanosomes in their blood in anything approaching the normal times; and of these numbers only three animals on diet 2, two on diet 3, and four on diet 4 showed the normal acme phase (Table VI). The remaining mice relapsed before the acute stage of infection had been reached, and did not show the usual chronic phase which normally persists for variable but substantial periods of time. In the other animals on diets 2, 3, and 4 trypanosomes were not demonstrated in the blood for up to as long as 26, 32, and 26 days (Tables III, IV, and V), and indeed were not demon-

TABLE VII.—Diet 1 (Stock Diet 86). Experiment II: Results of Infecting Mice with Trypanosomes

No. of Days After Inoculation	Mouse Numbers									
	201	202	203	204	205	206	207	208	209	210
4	—	—	—	—	—	—	—	—	+vl	—
5	+l	—	+vl	—	—	—	—	+vl	+vl	+vl
6	—	+vl	++	+vl	+vl	+vl	—	+++	+l	—
7	+++	++	+++	++	++	+++	—	+++	+++	+++
8	+++	+++	+++	+++	++	+++	+vl	+++	+++	+++
9	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
11	+++	+++	—	+++	Dead	+++	+++	+++	+++	+++
12	+++	+++	—	+++	—	—	—	—	—	+++
13	—	+++	—	—	—	—	—	—	—	—
14	—	+	+	—	—	—	—	—	—	—
16	—	—	+++	—	—	—	—	—	+++	—
18	+l	—	+++	+l	—	—	+++	++	+++	++
19	+++	—	+++	+++	—	—	+++	+++	+++	+++
20	+++	+	+++	+++	—	+	+++	+++	+++	+++
21	+++	++	+++	+++	—	+++	+++	+++	+++	+++
22	+++	+++	+++	+++	—	+++	+++	+++	+++	+++
23	+++	+++	+++	+++	—	+++	+++	+++	+++	+++

TABLE VIII.—Diet 3 (20% Casein). Experiment II: Results of Infecting Mice with Trypanosomes

No. of Days After Inoculation	Mouse Numbers									
	211	212	213	214	215	216	217	218	219	220
4	—	—	—	—	—	—	—	—	—	—
5	—	—	—	—	+vl	—	—	—	—	—
6	—	—	—	—	+l	—	—	—	—	—
7	+vl	—	—	—	+	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—	—	—
11	—	—	—	—	—	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—
14	—	—	—	—	—	—	—	—	—	—
16	—	—	—	—	—	—	—	—	—	—
18	—	—	—	—	—	—	—	—	—	—
19	—	—	—	—	—	—	—	—	—	—
20	—	—	—	—	—	—	—	—	—	—
21	—	—	—	—	—	—	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—
23	—	—	—	—	—	—	—	—	—	—

TABLE IX.—Diet 5 (Natural Diet of Bread, Milk, and Oats). Experiment II: Results of Infecting Mice with Trypanosome.

No. of Days After Inoculation	Mouse Numbers									
	221	222	223	224	225	226	227	228	229	230
4	—	—	—	—	—	—	—	—	—	—
5	—	—	—	—	—	—	—	—	—	—
6	—	+vl	—	+	++	—	+vl	++	+vl	—
7	+	+	+l	++	+++	—	++	+++	++	++
8	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
9	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
11	+++	Dead	+++	Dead	+++	+++	+++	+++	+++	+++
12	+++	—	+++	—	—	+++	+++	+++	Dead	+++
13	+++	—	+++	—	—	+++	+++	+++	—	+++
14	+++	—	+	—	—	+	+++	—	—	+++
16	Dead	—	+++	—	+++	+++	+++	+++	—	+++
18	—	—	+++	—	+++	+++	+++	+++	—	+++
19	—	—	+++	—	+++	+++	+++	+++	+vl	—
20	—	—	+++	—	+++	+++	+++	+++	—	—
21	—	—	+++	—	+++	+++	+++	+++	—	—
22	—	—	+++	—	+++	+++	+++	+++	—	—
23	—	—	+++	—	+++	+++	+++	+++	—	+++

— to +++ = range of numbers of trypanosomes in blood (see text, p. 854). l = little; vl = very little.

strated at all in five, six, and four animals of the respective dietary groups 2, 3, and 4, even after reinoculation with the blood of a fresh "acme" passage mouse. In mice given diet 2, 3, or 4 infection followed a much milder course than in those given diet 1. This was true in all mice not reaching or dying at the acute stage, as judged by the total numbers of trypanosomes in the blood of the animals over the period of the experiment. When the persistent chronic stage was reached, however, death was often rapid (cf. Table II and Tables III, IV, and V).

The results of Experiment I are supported by those of Experiment II. The mice fed on the casein diet 3 showed only the slightest evidence of blood-stream invasion by the parasites during the 23-day period of observation. The infection followed an acute course in both the natural diets, Nos. 1 and 5, and this course was that normally recorded in this laboratory over many years.

Maegraith *et al.* (1952) concluded that milk probably contains something that can inhibit or restrict the development of the asexual phase of blood-transmitted *Plasmodium berghei* in the rat and the mouse. Another possibility is that milk may be deficient in certain nutrients required by the parasite (*British Medical Journal*, 1952). The second explanation would fit the results observed in the present experiments with *T. congolense* in mice given diets with paramilk casein as the source of protein. It is clear that parasitaemia developed much more rapidly and attained a higher level in mice given diets 1 and 5, which were nutritionally more complex than the casein diets. Moreover, since diet 5 also contained milk, inhibition of parasite growth from the absence of undefined nutrients rather than from an anti-parasitic effect of milk might appear to be the more tenable explanation. It may be of importance to note that the mice made good gains of weight on all diets, especially on diet 4, which contained a high proportion of carbohydrate (Table X).

TABLE X.—Weekly Mean Weights (g.) of Uninfected Mice Given Experimental Diets 1-4

Diet No.*	Age of Mice (Weeks)									
	4	5	6	7	8	9	10	12	17	
1	19	24	29	30	31	32	34	36	39	
2	17	25	30	30	32	32	33	35	35	
3	20	24	30	33	33	35	37	37	37	
4	18	25	32	34	36	37	39	41	44	

* Each dietary group comprised 4 males and 4 females; litter mates were evenly distributed.

Summary

Mice fed on five different diets were experimentally infected with *T. congolense*.

Parasitaemia with acute followed by chronic infection developed as expected in mice fed on two of the diets, which were diets of the type normally employed in laboratories for rearing and maintenance of mice.

In mice fed on three of the diets in which milk casein was the source of protein the parasitaemia was either delayed or prevented.

Since one of the two "normal" diets contained milk but permitted normal development of the infection it might appear that failure of the incomplete diets to nourish the parasite is the explanation of the observed results, rather than that milk itself contains an anti-parasitic agent.

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HISTOPLASMOSIS IN GREAT BRITAIN

DESCRIPTION OF A SECOND CASE OF DISSEMINATED HISTOPLASMOSIS; TREATMENT BY ETHYL VANILLATE

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Work in the past few years on human infections by the *Histoplasma capsulatum* has emphasized certain features. Generalized dissemination (disseminated histoplasmosis) is common and usually fatal. Infection confined to the skin is frequent, though, unlike cutaneous blastomycosis, the skin lesion is usually within a short while followed by manifestations of dissemination (Curtis and Grekin, 1947) and is therefore often fatal. Infection can be confined to a single organ or viscus—usually the lung—with at no time evidence of dissemination and often no past history of even mild illness. These cases are identified usually after recovery by a positive intradermal histoplasmin test or by complement fixation.

Only one other case of disseminated histoplasmosis has been reported in Great Britain, and this occurred in 1940 (Derry, Card, Wilson, and Duncan, 1942). A regular soldier aged 30 developed his illness in France in 1940 and the diagnosis was eventually made at necropsy in Great Britain. He had been resident in India in 1932-6 and in the Sudan in 1936-7; this gives a possible incubation period of three years at least (assuming the disease is not indigenous to France).

In the second case, which we report below, the patient had not been out of England for seven years. Symptoms first appeared about a year before admission to hospital, and we must therefore assume either that the disease has an incubation period of at least six years or that he contracted his illness in England. We regard the first of these suggestions as the more probable.

Arblaster (1950) and Crofton (1950) report three cases of pulmonary calcification in England in which the diagnosis of "healed" histoplasmosis was suggested because of a positive histoplasmin intradermal test. All three patients had been resident in the U.S.A. or Canada. Duncan (1945, 1947) isolated an atypical organism from a skin lesion in a man from West Africa.

In 1951 Limerick described the development of a retrocaecal abscess occurring after appendectomy in 1947 in a man aged 35. The abscess cleared up in three weeks with drainage and was said to be due to *H. capsulatum*. No further details are given.

The cases of Duncan, Arblaster, and Limerick, however, do not conform in many ways to the usually accepted criteria and must be regarded as very doubtful. Hutchison (1952) reported a localized laryngeal lesion due to *H. capsulatum* in a fit man of 72 who had lived

in Hyderabad for 30 years and had spent some time in Malaya. He had, however, been resident in Great Britain since 1934 (six years in Sussex and eight years in Dumfriesshire until the diagnosis in 1948). He was fit and well in 1951.

These cases are particularly interesting on two counts: (1) the three patients, not from the American continent, had all been to India; and (2) in view of the prolonged incubation period it is likely that further cases may now be expected to occur in this country in soldiers who had been resident in endemic areas during the war.

Case History

The patient, a man aged 32, had been in H.M. Forces for six years and was discharged in England in 1945. He had spent most of his time at Alexandria and Port Said, but had visited Durban for three weeks, had spent three weeks in Tobruk, and had stayed at Bombay for two months. He visited numerous places in the Near East, including Cyprus, Aden, and Malta, but never went ashore.

He began to complain of peptic-ulcer-like abdominal pain at the end of 1951. On October 14, 1952, he first attended this hospital, and he was seen by one of us (S.L.) on December 17. On examination he was pyrexial, with obvious loss of



FIG. 1.—Granulomatous ulcer inside right cheek.

weight, a large spleen, a large liver, a few small axillary glands, pallor, marked tenderness over the sternum, and two large ulcers in the mouth (see Fig. 1). Examination of the central nervous system was normal; the blood pressure was 125/75 mm. Hg. The ulcers (about 2 cm. in diameter) were situated on the hard palate and the inside of the right cheek. They were granulomatous in appearance, with a raised rolled edge. The patient was admitted to the medical wards.

On December 19 a blood count showed: haemoglobin, 58%; red cells 3,300,000; white cells, 3,000 (72% polymorphs, 1% metamyelocytes, 1% eosinophils, 11% lymphocytes, 8% monocytes, 7% stab cells). A marrow puncture was normal and did not favour the diagnosis of leukaemia. W.R. and Kahn test were negative. It was felt that the only alternative diagnosis now possible was that of disseminated histoplasmosis.

Penicillin in large doses and the local application of an antibiotic to the ulcers was ineffective, and was discontinued after ten days. An x-ray film of the chest on December 29 showed the presence of a small opacity in the right costophrenic angle. Intravenous hydroxy-stilbamidine for ten days was ineffective. On January 7, 1953, his haemoglobin was 54% and the blood count was unchanged. Repeated estimations of plasma proteins, serum bilirubin, thymol turbidity, and cephalin-cholesterol flocculation were unchanged and normal. Blood urea was 26 mg. per 100 ml. A histoplasmin intradermal test was negative (no wheal or

erythema). An electrocardiogram on January 14 was within normal limits.

An x-ray film of the chest on January 21 showed extensive spread of the pulmonary lesion (see Fig. 2). On the 24th small ulcers of the skin were appearing and doses of sulphadiazine were started with no improvement. On the 29th ethyl vanillate was given.

On February 1 he was having great difficulty in keeping down the capsules of ethyl vanillate, and from February 5 it was given in an emulsion. The emulsion was made up to contain 12.5 g. of ethyl vanillate in 200 ml., and this was dripped into the stomach through a Ryle's tube, the gastric drip lasting for 50 minutes and being given every six hours.

On February 9 he said he felt very much better, but was even more wasted. His blood pressure was 115/70 mm. Hg. There had been no improvement in any of his physical signs, and his clinical condition had grossly deteriorated. He died suddenly on the evening of that day.

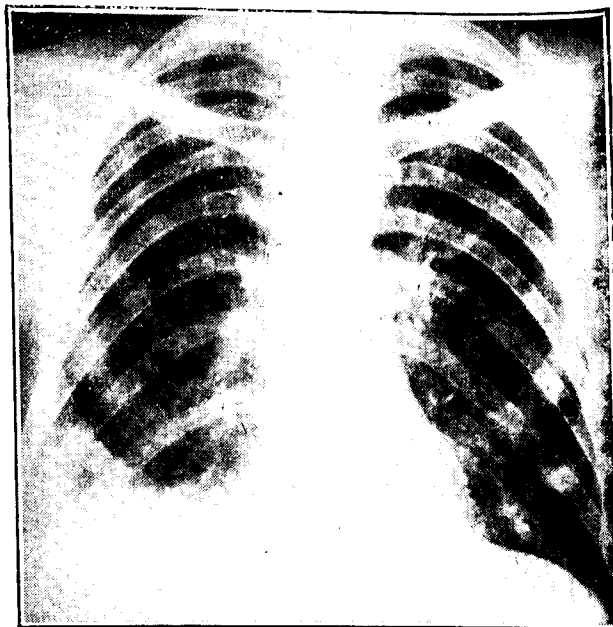


FIG. 2.—Chest x-ray film two weeks before death, showing extensive bilateral lung involvement.

Post-mortem Findings

The liver weighed 1,552 g., and a large number of pale slightly raised nodules up to 1.5 cm. in diameter could be seen through the capsule. Enlargement of lymph nodes was general, but was especially marked in the abdomen. The suprarenals showed enormous enlargement, presenting as yellowish rounded masses 6 by 6 by 4 cm., on each side deforming the upper pole of each kidney. On section the suprarenals had a cream-coloured honeycombed appearance with some liquefaction. The kidneys and bowel showed no detectable lesions. The spleen weighed 430 g., with a splenunculus the size of a walnut. The lungs each weighed just over 600 g., all lobes showing very numerous white solid areas 1–5 mm. in diameter, sometimes coalescing into larger masses with central necrosis.

Histological evidence of histoplasmosis was found in sections from the liver, spleen, lymph nodes, lungs, bone marrow, thyroid, and suprarenals. Very scanty parasites were detected in sections of skin lesions. In each case distension of reticulo-endothelial cells by large numbers of capsulated yeasts was evident (Fig. 3). Goodpasture's stain gave clearer definition of the parasites than Schiff's periodic acid or phloxine tartrazine. In the suprarenals there was extensive involvement of the cortex as well as the medulla, with a very small outer fringe of unaffected cells.

H. capsulatum was cultivated from the spleen, suprarenals, liver, lung, and bone marrow.

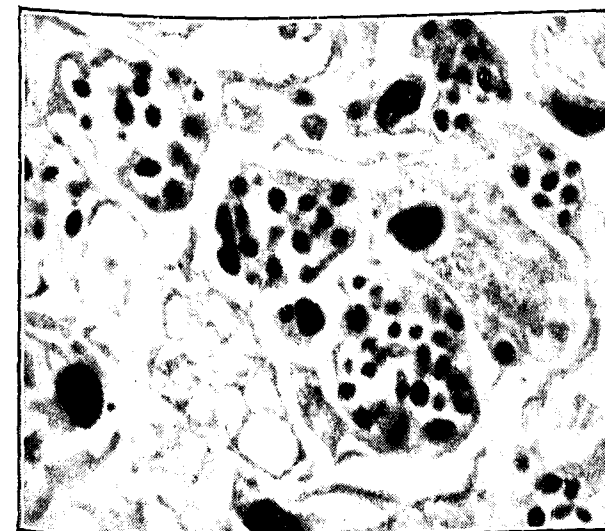


FIG. 3.—Section of lymph node showing endothelial cells engorged with the parasites.

Bacteriology

Examination of the first biopsy (December 29) was so suggestive of histoplasmosis that a second biopsy was carried out (January 21) in order to isolate the parasite. An impression smear (January 21) showed an abundance of oval capsulated yeasts (Fig. 4), and cultures were made on Sabouraud's and glucose agar (pH 7.4) at room temperature and at 37° C. On 1% glucose agar after seven days at room temperature there appeared a profuse growth of small fluffy white colonies adherent to the medium. A few days later typical tuberculate chlamydospores of *H. capsulatum* were found in the centre of the colonies. No growth occurred on Sabouraud medium, and it appears that, from subculturing, this strain grows very slowly at a low pH. On glucose agar, growth was best at room temperature at a pH approaching neutrality. The colonies become brownish, with the appearance of chlamydospores. The chlamydo-



FIG. 4.—Showing organisms with characteristic unstained capsules obtained by direct contact smear from biopsy of cheek ulcer. ($\times 2,000$.)

spores (Fig. 5) are of two types—a large tuberculated thick-walled structure 14–16 μ in diameter and a small smooth pear-shaped form 4–5 μ in diameter. From the mycelial growth cultures were made on sealed blood-agar slants at 37° C., and after a fortnight smooth creamy colonies of the yeast form were produced. The yeast cells were of varying shape, about 2–3 μ in diameter, and about half appeared oval with pointed ends. The yeast form did not

ferment glucose, maltose, saccharose, or lactose after 14 days' incubation at 37° C.

With the use of the slide-cell technique and 1% glucose agar the control cell showed a good growth in six days but no growth occurred in concentrations of 4.2 mg. of ethyl vanillate or greater. Similar tests carried out with "cuprimyl" (tetraethylamine salt of cupric-bis-8-hydroxyquinoline 5:7 disulphonic acid) showed no inhibition in a concentration of 10 mg. per 100 ml.

Discussion

In this case there did not appear to be any evidence of adrenal failure, though a close watch was kept for this both biochemically and clinically; nevertheless the sudden death was very suggestive of this.

The diagnosis of the disseminated disease can in most cases be suspected on the clinical picture: irregular fever, ulceration of the mouth and palate of a peculiarly granulomatous type (Fig. 1), ulceration of the skin, enlargement of the liver and spleen, lymph-node enlargement, developing pulmonary lesions which may show a localized consolidation with or without cavitation (Fig. 2), or, more commonly, generalized miliary opacities in the lungs. Anorexia and much loss of weight, to eventual gross cachexia, are the rule. Abdominal pain and discomfort is common, and intestinal ulceration with diarrhoea not infrequent. The diagnosis can be confirmed, however, only by identification of the organism in the tissues (Fig. 3) and positive culture.



FIG. 5.—Characteristic "cog-wheel" appearance of chlamydospores seen on culture of *H. capsulatum*. ($\times 2,000$.)

Treatment

Clinical experience has shown the complete failure of promanide (promin in U.S.A.), "actidione" (an antibiotic from *Streptomyces griseus*), penicillin, streptomycin, aureomycin, chloramphenicol, sulphonamides, iodides, arsphenamine, mercurials, stilbamidine, and antimonials to affect the course of the disease and its fatal termination, and to this list we would add hydroxy-stilbamidine. Two cases have been reported in which pulmonary resection has apparently resulted in survival for two years and for six months respectively (Hodgson, Weed, and Clagett, 1950).

Ethyl vanillate, obtained by oxidizing lignin in the spent liquor from the sulphur pulp manufacturing process, has been used in disseminated histoplasmosis (Christie, Middleton, Peterson, and McVickar, 1951; Ellis, Scott, and Miller, 1952), being at the moment the drug of choice in treating histoplasmosis and coccidioidomycosis. In concentrations of 10 to 30 mg. per 100 ml., it has a marked inhibiting effect on *Blastomyces dermatitidis*, *Coccidioides immitis*, and *H. capsulatum* (information provided by Messrs. Squibb). However, a difference in susceptibility to ethyl vanillate has been demonstrated for different strains of *H. capsulatum* which may be of significance in treatment. It is, however, rather surprising that the organism in our case did not grow in ethyl vanillate at a concentration of 4.2 mg. per 100 ml., yet, in spite of blood levels well above this for 10 days (see Table), the disease here showed no signs of regression.

Ethyl Vanillate Levels in Blood and Urine (24-hour Collections)

Day	Plasma Vanillic Acid (Corrected for Normal Phenolic Substances in Blood) (mg./100 ml.)	Urine Vanillic Acid (Calculated as Vanillic and Phenolic Substances Excreted (g.))
28/1/53		1.70
29/1/53		0.88
30/1/53	6.8	5.70
31/1/53		16.50
1/2/53		14.40
2/2/53	3.3	5.75
3/2/53	18.6	26.10
4/2/53	15.8	
5/2/53	20.5	11.40
6/2/53		4.83
7/2/53		6.42
9/2/53	21.5	

Blood levels of over 30 mg. per 100 ml. are apt to cause toxic phenomena (coma with or without convulsions), and if the level exceeds 50 mg. the toxic phenomena can be lethal (Christie *et al.*, 1951). To maintain this blood level in an adult requires about 40 to 50 g. of ethyl vanillate daily by mouth, and in a child 0.75 to 2.5 g. per kg. of body weight a day. More recently, Christie (1952) said that ethyl vanillate was the only therapeutic agent of any value in histoplasmosis, though it was not satisfactory.

The patient here described received 45 g. daily from February 2, but part of this was vomited. From February 5 he received and retained 50 g. daily.

Summary

After a brief review of the cases of histoplasma infection previously published in Great Britain the second case of disseminated histoplasmosis to be reported is described. This case was fatal in spite of treatment with 45-50 g. of ethyl vanillate daily. Some information is included on culture of the organism, as in this case it showed certain cultural peculiarities.

We are grateful for the help we received from many sources in the treatment of this case. We would particularly like to thank Dr. A. S. Osborne, of the American Embassy, Dr. W. P. Kennedy, of the Ministry of Health, and Mr. C. B. Sitterson, M.D., of the Institute of Paper Chemistry, Wisconsin, U.S.A., for their advice; Dr. Harvey Blank and Messrs. E. R. Squibb and Sons, New York, U.S.A., for the prompt dispatch to us of ethyl vanillate and appropriate information adequate for the treatment of this case; Dr. R. Forgan, Dr. John Harper, and Messrs. May and Baker, of Dagenham, for their advice and for supplying us with the hydroxy-stilbamidine and "cuprimyl" used by us; Mrs. E. D. Price for her patience and careful secretarial work; and Mr. E. Sheppard for his most excellent photography. Finally, we are most grateful to the nursing staff for the great care with which treatment was carried out, and to Dr. G. H. Cranswick and Dr. P. G. Swann for their many helpful suggestions.

Since this paper was completed we understand that a case of disseminated histoplasmosis in a young woman was transferred to this country from South Africa, where the diagnosis was made. Unfortunately the patient died two days after arrival.

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THE MECHANISM OF SYNCOPE
AFTER COUGHING

BY

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Syncope from coughing has been considered a rare condition; thus Whitty (1943) and Baker (1949) could collect only about 100 cases from the literature. Charcot (1876) thought it was a form of epilepsy, and by coining the term "laryngeal vertigo" made it the province of neurology and throat surgery. McCann *et al.* (1949) obtained some continuous records during coughing in two subjects with the syndrome. They believed that syncope was not primarily epileptic but circulatory in origin, and that pulmonary arterial vasoconstriction or pathologically sensitive "vascular reflexes" might be responsible. Correspondence in the *British Medical Journal* resulted in no factual data, but suggested that the condition might be commoner than supposed.

Material and Methods

The patients were 27 middle-aged or elderly males who gave a history of syncopal attacks on coughing. In many it was found possible to provoke an attack by asking the patient to give a few strong coughs. Inhaling cigarette smoke or irritation of the nose was used in a few. Pressures were recorded continuously by capacitance manometers (Hansen, 1949): intrathoracic by means of a water-filled oesophageal tube (Dornhorst and Leathart, 1952); intracardiac by catheter; and intra-arterial and venous by needles or fine catheters. Fore-arm flow was measured with a plethysmograph and recorded on the same photographic paper (Davies, 1953).

Results

The data obtained in the 27 subjects with syncope were compared with similar measurements in about 40 other subjects of all ages and both sexes. There was no qualitative difference in the effects of coughing in the two groups. A single "ahem" produced an intrathoracic pressure rise of 20 to 30 mm. Hg, ordinary coughing in both groups 50 to 100 mm. Hg, and coughing leading to syncope 150 to 300 mm. Hg. The circulatory effects were proportional to the violence and duration of the coughing attacks. All subjects performed the Valsalva manoeuvre. There was no difference in circulatory effects after the Valsalva manoeuvre between those with cough syncope and those without cough syncope.

Continuous records of syncopal attacks were obtained on fifteen occasions, and many minor attacks causing dizziness or "blackout" were also recorded. The subjects coughed in two ways, continuous or intermittent, with different circulatory effects. Both, when violent, resulted in syncope.

Continuous Coughing

The subjects coughed continuously in prolonged paroxysms lasting many seconds without drawing breath. Often the intrathoracic pressure reached 300 mm. Hg and was maintained at this level until a breath was taken or the paroxysm ended. The circulatory effects were essentially similar to those of the Valsalva manoeuvre, but more pronounced owing to the greater rise of intrathoracic pressure. When asked to perform their maximum Valsalva manoeuvre it was found that few could reach and maintain an intrathoracic pressure of 100 mm. Hg. This conspicuous

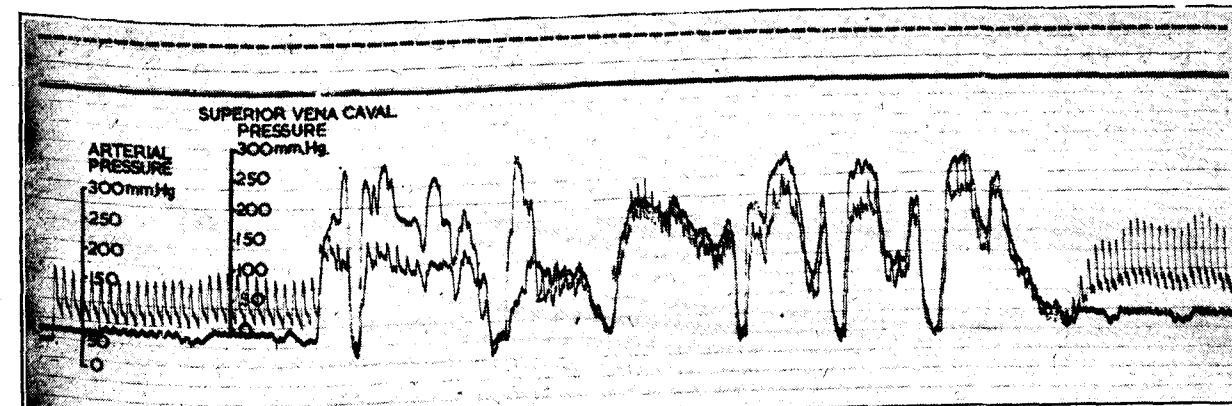


FIG. 1.—An example of continuous coughing lasting many seconds. The large downward deflection in arterial and superior vena caval pressures during the attack are due to occasional inspirations. Consciousness was lost at the end of the attack, when arterial pressure was lowest. Time marker in seconds in this and subsequent records.

difference between coughing and the Valsalva manoeuvre may result from the greater number of muscles and the more powerful intermittent muscular effort employed in coughing.

An example of syncope from continuous coughing is shown in Fig. 1. Unconsciousness resulted when arterial pressure was lowest at the end of the attack. As in other forms of syncope from acute arterial hypotension (Barcroft *et al.*, 1944; Brigden *et al.*, 1950; Howard *et al.*, 1951; Howarth and Lowe, 1953) the critical level for loss of consciousness was about 50 mm. Hg. Twitching movements and convulsions were common during syncope.

Two subjects were observed to become unconscious, as judged by rolling up of the eyes and twitching movements, during coughing, while intrathoracic and arterial pressures were still greatly elevated. Catheters passed high up the internal jugular vein showed that intrathoracic pressure changes were fully transmitted to the venous outflow of the brain. As can be seen in Fig. 1, the arterio-venous pressure difference across the brain may reach its lowest level during the paroxysm.

Intermittent Coughing

This was the "normal" form of coughing, inspiration following each cough in a fairly regular sequence. It caused large rapid fluctuations in intrathoracic pressure, which will be termed "cough transients." It was followed in all subjects by a fall of arterial pressure. An example of syncope from this form of coughing is shown in Fig. 2. Consciousness was lost at the lowest blood-pressure level.

Physiological Effects of Coughing

Fig. 3 summarizes the changes caused by the Valsalva manoeuvre (or continuous coughing) and intermittent coughing. The data have been published elsewhere (Sharpey-Schafer, 1953). A to B is the period of raised intrathoracic pressure. This pressure is transmitted to the arteries, veins without valves, and the chambers of the heart. In the periphery, venous valves shut and blood accumulates distal to them at a rate which depends on previous vasomotor tone (Howard *et al.*, 1951) and the height to which the arterial supply pressure is raised.

The accumulation of blood in peripheral veins results in a decrease in the filling pressure of the heart and subsequent fall in stroke output. Pulse pressure is decreased in peripheral arteries during the Valsalva manoeuvre or continuous coughing, but large cough transients are the conspicuous feature of arterial records in intermittent coughing. Baroreceptors therefore are exposed to diminished pulsations during the Valsalva manoeuvre and to large

pressure transients during intermittent coughing. In the former case the response is peripheral constriction and in the latter dilatation, as shown in the forearm during the period B to D. These blood-flow changes do not occur in sympathectomized limbs, and are therefore mediated through the vasomotor nerves. The suggestion that these circulatory responses result from decreased or increased stimulation of baroreceptors by rapid transients is supported by recent work on the isolated carotid sinus of the dog (Ead *et al.*, 1952).

There is a further important difference between the Valsalva manoeuvre and intermittent coughing. In the former at point B the intrathoracic pressure falls immediately to the control level; in the latter it is elevated 10 or more mm. Hg (Fig. 3) and may remain so for many seconds during the period B to D. This raised pressure is transmitted to the chambers of the heart and great veins (Fig. 4) and may play a part in the production of post-tussive arterial hypotension by reducing cardiac output below control values, since it can be shown that positive-pressure breathing causes a fall in cardiac output (Werkö, 1947). There was no evidence on measurement of pulmonary arterial vasoconstriction as suggested by McCann *et al.* (1949).

Clinical Considerations

Some knowledge of the causes of this form of syncope has been helpful in the interpretation of symptoms. If normal physiological mechanisms only were involved it seemed unlikely that the condition was rare. The 27 cases investigated were found without difficulty over a period of two years and many others were seen clinically. Indeed, minor symptoms such as dizziness are almost universal among those who cough strongly. The curious rarity of the

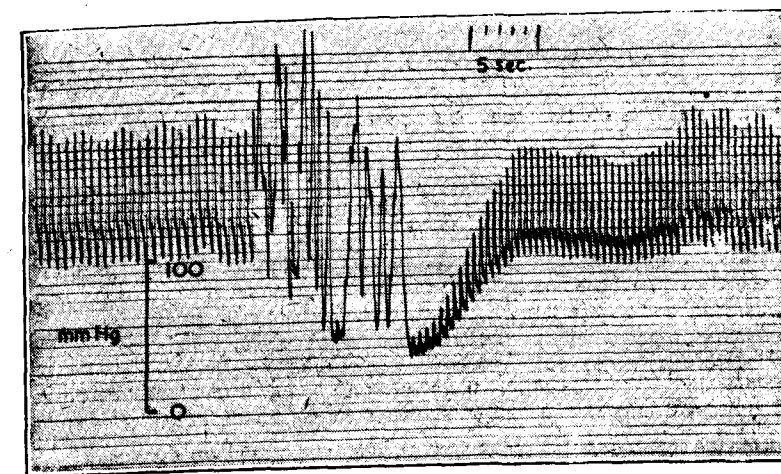


FIG. 2.—Arterial pressure record of intermittent coughing. Large arterial cough transients were followed by hypotension and syncope.

syndrome in females may be due, in part, to social taboos which impose the belief that such exhibitions of violence are "unladylike." The case of a Scots woman with typical attacks has, however, been reported to me. Continuous records are not yet available from children with whooping-cough and infants with breath-holding.

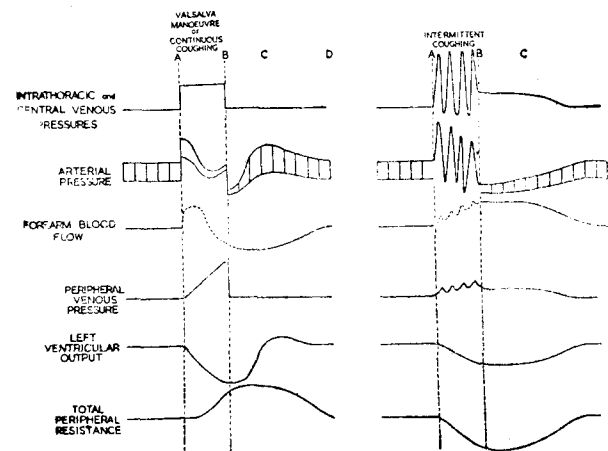


FIG. 3.—Diagrammatic representation of the circulatory events caused by the Valsalva manoeuvre or continuous coughing, and intermittent coughing (see text). The changes in left ventricular output were not measured directly but were inferred from the arterial records.

Patients with large quantities of sputum from chronic pulmonary disease rarely show these symptoms. Continuous records during coughing in such patients showed that intrathoracic pressure rose no higher than about 100 mm. Hg, and although the usual circulatory changes were present they were not sufficiently pronounced to interfere with the blood supply to the brain.

The role of smoking, drinking, and bad teeth and other infections is to produce the upper respiratory tickle, which, like some forms of skin itching, needs the utmost violence to assuage. This form of coughing may become a habit. It is easy to see why middle-aged males are the chief victims.

A history of a single cough followed by immediate unconsciousness should be regarded with suspicion. Three of the subjects reported here gave such a history, but proved to have typical attacks of prolonged violent coughing followed by syncope. Questioned after a recorded attack, they still claimed immediate unconsciousness.

Two may have had a short period of retrograde amnesia; the third interpreted 15 seconds as "immediate."

The occurrence of fits during syncope after coughing is likely to be more misleading to neurological than to circulatory workers, who are probably aware that a fit can occur in any normal subject if the blood flow to the brain is sufficiently reduced. If the subject is a known epileptic the full seizure is more easily induced by methods of lowering the blood pressure. Two of the present cases had a history of epilepsy and grand mal after violent coughing.

The appearance of the subject during continuous violent coughing is alarming, and may suggest to the lay and even the medical mind the likelihood of a burst blood vessel,

while the subsequent syncope may indicate that this calamity has occurred. The vessels of internal organs such as the brain, however, are protected from high pressure differences across their walls, since surrounding structures are exposed to the same pressure, and, as explained above, the pressure across these vessels is less, not more, than normal.

It is only in places where veins are in near contact with the outside atmosphere that pressure differences of 300 mm. Hg may be built up. Since surface veins are protected by valves, high pressures are reached only after a period of some seconds. In prolonged paroxysms of coughing nose veins commonly burst, and occasionally veins in the conjunctiva and anus do likewise.

Treatment

Attempts to alter bad habits or causal irritant factors proved singularly unsuccessful in this group of middle-aged men. Explanation of the mechanism was tried with more intelligent subjects, but even these found it difficult to realize that extreme violence was unnecessary and clung to their way of coughing for various fanciful and erroneous reasons.

The investigation, however, showed a method which, while annoying to the investigator, was almost uniformly successful in alleviating the attacks. It was found on the first occasion when measurements were made that an attack could be induced with ease. Subsequently more and more encouragement became necessary to produce the required intrathoracic pressure changes. The subjects learnt by demonstration that it was violence which caused syncope. As one said on the fifth occasion, "I don't see why I should cough myself unconscious any more—to please you, Doctor."

Summary

Syncope from coughing was found to be common and to result from an acute diminution of supply pressure of blood to the brain. Continuous records in 27 cases indicated that normal physiological mechanisms only

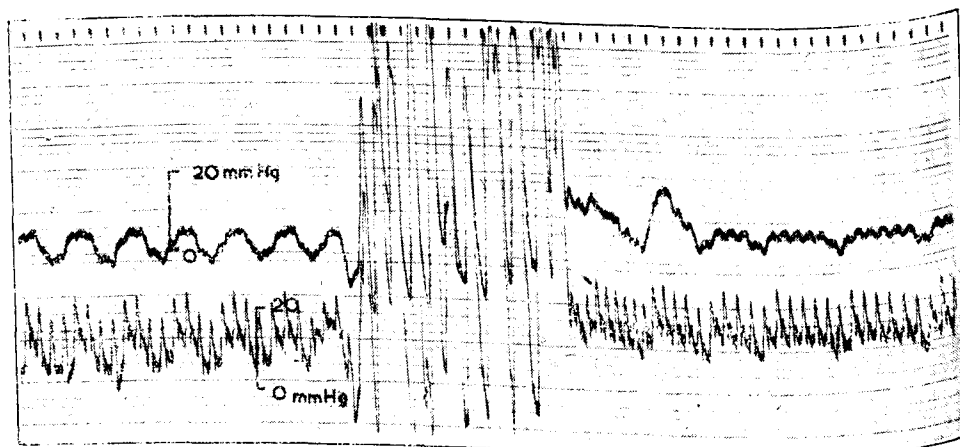


FIG. 4.—Upper curve, intra-oesophageal (intrathoracic) pressure; lower curve, pulmonary artery pressure. Both were elevated to the same extent after coughing.

were involved. The violence of the coughing was the determining factor, intrathoracic pressures of 200 to 300 mm. Hg being reached.

Subjects who coughed continuously without drawing breath were shown to have circulatory changes which were exaggerated examples of the effects of the Valsalva manoeuvre. Consciousness was usually lost during the period of acute hypotension following cessation of coughing. Occasionally syncope occurred while intrathoracic pressure was still high, but the arterio-venous pressure difference across the brain was greatly reduced.

Subjects who coughed intermittently also had syncope. Arterial pressure and peripheral blood flow records showed vasodilatation following this form of coughing in contrast to the vasoconstriction which resulted from the Valsalva manoeuvre and continuous coughing.

It is suggested that vasodilatation following intermittent coughing is due to the stimulation of baroreceptors by large arterial cough transients.

Intrathoracic pressure remained elevated about 10 mm. Hg for many seconds following intermittent coughing.

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EFFECTS ON BLOOD PRESSURE OF VENTRICULAR ASYSTOLE DURING STOKES-ADAMS ATTACKS AND ACETYLCHOLINE INJECTIONS

BY

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Ventricular standstill may occur spontaneously in cases of heart-block, and during Stokes-Adams attacks consciousness is lost if asystole is sufficiently prolonged. Cardiac arrest also follows the intravenous injection of acetylcholine, with resulting loss of consciousness (Phillips *et al.*, 1952). Observations have been made to determine the peripheral arterial pressure in these two types of case, and the results are reported in this paper.

Blood pressure was recorded continuously in the brachial artery, using a capacitance manometer (Hansen, 1949). The Stokes-Adams attacks occurred spontaneously in a patient with heart-block, who later showed no macroscopic heart lesion at necropsy. Rapid intravenous injections of 50 to 200 mg. of acetylcholine chloride were given as a part of routine therapy to psychoneurotic patients who had no organic circulatory abnormality on clinical examination.

Results

The blood-pressure records in both types of case show a striking similarity. Typical examples are shown in Figs. 1 and 2. Ventricular asystole was always followed by an acute

fall in blood pressure. With prolonged standstill, blood pressure fell rapidly at first, then more slowly, and finally remained constant at about 20-25 mm. Hg. Loss of consciousness was often followed by convulsive movements.

When ventricular contractions were resumed an "overshoot" was seen on all blood-pressure records: systolic and diastolic pressures rose above control levels for a variable number of seconds before the blood pressure returned to normal. An increase in pulse pressure, more striking in the Stokes-Adams attacks, was recorded during the overshoot. The characteristic flush which accompanied restoration of the circulation following the Stokes-Adams attacks was also observed after cardiac arrest from acetylcholine injection.

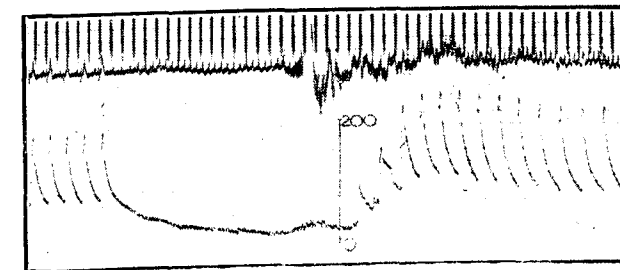


FIG. 1.—Effects on the blood pressure of a Stokes-Adams attack. Above: Lead II of the electrocardiogram. Convulsive movements produced interference with the record after 16 seconds asystole. Below: Continuous brachial arterial pressure record. Time (top) in seconds. Calibration in mm. Hg.

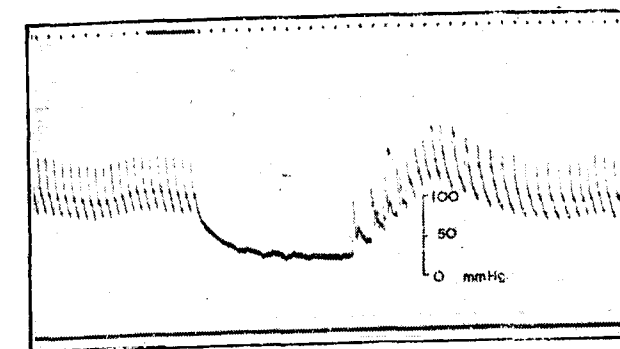


FIG. 2.—Effect on the blood pressure of cardiac arrest produced by 100 mg. of acetylcholine given intravenously. Period of injection is shown by signal on time marker. Time in seconds.

Discussion

In spontaneous and induced ventricular asystole, blood pressure falls rapidly to syncopal levels. Systemic arterial pressure tends to stabilize during cardiac standstill at 20-25 mm. Hg. This figure does not differ greatly from the standing pressure of 14 to 22 mm. Hg observed by Dowling *et al.* (1952) during asystole induced for 5 to 10 seconds by carotid sinus pressure. These authors, however, did not record a subsequent overshoot in the systemic pressure.

The overshoot may be regarded as a response to the lowered blood pressure. A similar overshoot follows the fall in effective systemic pressure during the Valsalva manoeuvre (Hamilton *et al.*, 1936; Howard *et al.*, 1951), where it has been shown to be due to sympathetic vasoconstriction (Wilkins and Culbertson, 1947). Vasoconstriction has been demonstrated in muscle vessels during the overshoot of the Valsalva manoeuvre (Howard *et al.*, personal communication); but vasodilatation may be present in the vessels of the skin during the overshoot after asystole, since vivid flushing of the face and neck occurs in both Stokes-Adams attacks and after intravenous acetylcholine injection.

The striking similarity between acetylcholine-induced asystole and spontaneously occurring Stokes-Adams attacks suggests that these effects of intravenous acetylcholine injections result from asystole alone.

Summary

During ventricular asystole in spontaneously occurring Stokes-Adams attacks and following rapid intravenous injections of acetylcholine systemic blood pressure fell to low levels.

During cardiac standstill of up to 21 seconds arterial pressure remained constant at 20 to 25 mm. Hg.

An "overshoot" occurred in the blood pressure following the resumption of ventricular contractions in both forms of asystole: systolic and diastolic pressures increased above control levels before arterial pressure returned to normal.

It is suggested that this action of intravenous acetylcholine results from asystole only.

The cases investigated were under the care of the physicians to St. Thomas's Hospital and the National Heart Hospital.

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HIATUS HERNIA AND PREGNANCY

A REVIEW OF NINE CASES AND THE LITERATURE

BY

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Herniation of part of the stomach through the oesophageal hiatus of the diaphragm is a fruitful source of errors in diagnosis. Although this disorder is being detected more often (Avery Jones, 1952), it is still commonly overlooked.

Hiatus hernia is probably due in most cases to factors operating in adult life. Laxity of the tissues, with deficiency at the oesophageal ring, is common (Harrington, 1945). Hernia at this site is favoured by conditions raising intra-abdominal pressure and by recumbency. Such herniae may be oesophago-gastric or para-oesophageal, termed by Allison (1951) the sliding and rolling types, which may be present together.

The symptoms are protean, and have been well described by Nicholson (1952). Epigastric discomfort and vomiting are common. If the disorder is complicated by reflux oesophagitis there may be intense "burning pain" behind the lower end of the sternum, which may radiate up to the neck. There may be slight dysphagia, and a gastric ulcer may develop near the cardia. Retching of blood-stained fluid may proceed to frank haematemesis and melaena. Stricture may develop at the lower end of the oesophagus.

Review of Literature

Reports of hiatus hernia complicating pregnancy are infrequent. All authors emphasize that symptoms are aggravated by recumbency, worsen in the last trimester, and tend to clear up after delivery. Heartburn is particularly constant. Evans and Bouslog (1940) reported four cases in which this symptom was almost intractable, and Bush (1950) reported a similar case in which radiation of the pain to the ears was a bizarre addition. Vomiting may be severe and often culminates in haematemesis, which has been described by Schnepf (1943), Queries and Minor Notes (1937), Bourgeois and Hood (1949), Simmons *et al.* (1950), and Hahn (1952). Murless (1947) reported two cases of large para-oesophageal herniae causing vomiting and dyspnoea in pregnancy. Penman (1951) added to the literature four cases in which hiatus hernia produced persistent gastrointestinal disturbances during pregnancy.

Vinson (1921, 1923) described nine cases of oesophageal stricture following severe vomiting in pregnancy. Some of the records of these cases suggest that they were due to hiatus hernia. Rennie, Land, and Park (1949) described five cases of pregnant women who developed dysphagia and retrosternal pain in the latter months of pregnancy. Hiatus hernia associated with a short oesophagus and stricture was present in all five cases. In three, active oesophageal ulceration was demonstrated. Allison, Johnstone, and Royce (1943) described a similar case.

Case Reports

The following cases came to our notice during routine duties in 1950-2.

Case 1.—The patient, a 2-gravida, 1-para aged 31, was a thin woman whose previous health and first pregnancy were entirely normal. Her second pregnancy (estimated date of delivery, October 2, 1951) was complicated. Morning nausea and retching began at the sixth week and persisted throughout pregnancy. During the second trimester there were repeated attacks of "burning" pain behind the xiphoid, exacerbated by meals, recumbency, and stooping forward. Symptoms were worse at night and during the third trimester. Vomiting became so frequent that she was admitted to hospital at the thirty-eighth week and treated symptomatically. Her condition fluctuated until September 24, when, with the spontaneous onset of labour, vomiting culminated in a haematemesis. Labour was inert, and copious vomiting resulted in dehydration and ketosis. Intravenous fluids and gastric aspiration were begun, but a second haematemesis occurred which required blood transfusion. After spontaneous rupture of the membranes her condition improved and normal delivery followed. During the puerperium there were no untoward symptoms. On the ninth day a barium-meal examination showed a small para-oesophageal hernia without oesophageal ulceration or stricture. The stomach and duodenum were normal. We have been unable to trace the patient for a follow-up.

Case 2.—A 4-gravida, 3-para aged 32 attended the antenatal clinic at 20 weeks; the estimated date of delivery was January 8, 1952. She was a thin woman and complained of nausea, heartburn, and retching dating from the first month. No abnormality was found on clinical examination. At subsequent visits she reiterated these symptoms, for which a variety of alkaline medicines gave little relief. During the last trimester she emphasized that the heartburn was much worse at night, was better when she got up to vomit, only to recur when she lay down. From the thirty-eighth week the pain was noted to radiate up to the neck, and there was occasional dysphagia. On January 4 she vomited a few ounces of bright-red blood and was admitted to hospital. She responded fairly well, being nursed propped

up and given a light diet. Vomiting was only occasional, and labour on January 8 was uncomplicated, as was the puerperium. On the seventh day a barium-meal examination revealed a simple sliding hiatus hernia. The stomach and duodenum were normal. When seen in September, 1952, she had very occasional heartburn. A barium-meal examination was entirely normal.

Case 3.—A 2-gravida aged 40 was admitted to hospital on April 2, 1951, for a gynaecological operation. On routine questioning about her pregnancies, she stated that during the first pregnancy, 13 years previously, she had suffered from severe heartburn and vomiting from the sixth week. From the seventh month she had had to sleep propped up. So severe was the pain when she lay down. Symptoms cleared up with the onset of labour ("I never had a sick labour"). The second pregnancy, five years later, was "like a repetition of the first." After her pregnancies she kept fairly well until she became obese. In recent months she had experienced several attacks of heartburn, "indigestion," and vomiting relating to posture, being worse when lying down or stooping. She sometimes vomited "lumps like liver." A barium-meal examination revealed a large Type I hiatus hernia with marked regurgitation of stomach contents when in the prone position. Reduction and repair of the hernia was undertaken in the thoracic unit of another hospital. She has since been symptom-free, and was last seen in September, 1952.

Case 4.—A primipara aged 25 was admitted to hospital as an emergency case on February 5, 1952. She was 36 weeks pregnant. Her previous health had been normal. She had had slight morning sickness from the first month of pregnancy. From the fifth month she suffered from recurrent "burning" substernal pains, especially when prone at night, with occasional small vomits. During the month before admission the vomiting, though more frequent (sometimes ten times a day), was not copious. The patient was nursed propped up in bed. A normal diet was fairly well tolerated, but heartburn and vomiting recurred at intervals. A barium-meal examination on February 13 showed a Type I hiatus hernia, without complications. By February 20 the vomiting had become more persistent, and, after failure of medical induction, surgical induction of labour was undertaken. The progress of labour was unsatisfactory; vomiting became very severe, but there was no haematemesis. Dehydration and ketosis necessitated intravenous fluids, and labour was terminated after two hours in the second stage, by episiotomy and low forceps extraction under local analgesia. The puerperium was uncomplicated. She was well and symptom-free in May, 1952.

Case 5.—A primipara aged 25, 36 weeks pregnant, was admitted to hospital on February 15, 1952, as a case of rheumatic heart disease. She had been well until about 20 weeks, when she began to suffer from heartburn, retching, and occasional vomiting, especially at night, relieved by sitting or standing. Between the twenty-eighth and thirty-sixth weeks her exercise tolerance deteriorated, she became orthopnoeic, and she slept propped up at night. Henceforth, the heartburn, retching, and vomiting concerned her much less, although still present. On February 2 chest screening was undertaken, and a barium swallow confirmed enlargement of the left antrum and, concurrently, a small Type I hiatus hernia. Caesarean section under epidural anaesthesia was performed because of severe pre-eclampsia. There were no puerperal complications. A barium meal in September, 1952, failed to demonstrate a hiatus hernia.

Case 6.—A 2-gravida, 1-para aged 34, whose previous health had been good, was admitted as an emergency case on February 2, 1951, being 28 weeks pregnant. There had been severe vomiting during the first trimester in both pregnancies. The second pregnancy was further complicated by epigastric pains, which were particularly severe as pregnancy advanced. Vomiting was almost continuous for four days before admission, when she was noted to be thin and dehydrated, with ketonuria. The vomit was blood-stained. She was nursed sitting up in bed, and given parenteral fluids

and a continuous intragastric milk drip. A barium meal on February 5 showed a large Type I hiatus hernia without complications. She was discharged home symptom-free, and was subsequently delivered at term at another hospital. In July there was still slight indigestion, and a barium meal showed that the hernia was still present but was much smaller.

Case 7.—A primigravida aged 23 was admitted as an emergency case on December 7, 1950, when 35 weeks pregnant. There had been slight nausea and vomiting during the first trimester, and then no complaint until heartburn and vomiting began at 20 weeks. Symptoms were worse when lying down at night, and were relieved by sitting up. After a severe bout of vomiting, she was admitted to hospital. Dehydration required drip therapy, and she was discharged symptom-free on the seventh day. Symptoms recurred, but were mild until January 11, 1951, when she was admitted in labour. Labour was inert, there was continuous post-xiphoid pain, and frequent vomiting of small amounts of stale blood occurred. Intravenous fluids were given, and normal delivery followed. The puerperium was uncomplicated. In May she complained of dysphagia and had lost 28 lb. (12.7 kg.) in weight. A barium meal showed a hiatus hernia with an oesophageal stenosis immediately above it, about 2 cm. in length. This was later confirmed by oesophagoscopy, during which the oesophagus bled easily. The stricture was subsequently successfully resected.

Case 8.—A 2-para aged 40 had her first pregnancy in 1931. It was characterized by severe vomiting throughout and severe nocturnal post-xiphoid pains related to posture. Vomiting during labour had been severe, but was absent in the puerperium. The second pregnancy, in 1943, was like a repetition of the first. In recent years she had become plump, and the post-xiphoid pains had returned; being worse at night and on bending forwards, but were relieved by alkalis, vomiting, or sitting up. A barium meal in July, 1951, revealed a fairly large hiatus hernia.

Case 9.—A primigravida aged 24 was admitted on September 25, 1950, complaining of pains in the right iliac fossa, and persistent nausea and vomiting. Laparotomy revealed a 16 weeks pregnancy; a simple cyst of the right ovary was removed, together with a normal appendix. She remained well for six weeks, then began to suffer from severe nausea and vomiting, especially when lying down and after meals. On readmission on March 3, 1951, she was dehydrated, and 24 hours later she had a small haematemesis. Persistent vomiting necessitated almost continuous intravenous fluids. A barium-meal examination on March 8 revealed a Type I hiatus hernia with probable oesophageal ulceration. Surgical induction of labour was undertaken, but the first stage was inert, and she continued to vomit blood-stained fluid. As the maternal condition was deteriorating labour was terminated by caesarean section after 48 hours. A barium swallow on the twelfth post-operative day revealed marked functional improvement of the cardia, with little tendency to regurgitation of barium. A small tubular hiatal protrusion was still present, but only in the optimum position. There was no evidence of ulceration. In May, 1952, the patient was still complaining of nausea, heartburn, and occasional vomiting.

Discussion

Rigler and Eneboe (1935) have shown that the association of hiatus hernia with pregnancy is common, but they were unable to demonstrate any correlation between gastric symptoms and the presence or absence of hernia.

On consideration of the manner in which hiatus hernia can produce symptoms these findings are unexpected. It is possible that hiatus hernia in pregnancy is often overlooked for a variety of reasons. In current teaching concerning vomiting in pregnancy, neurosis is often cited, and some of the symptoms of hiatus hernia do suggest a functional illness. Further, the vomiting caused by hiatus hernia frequently ceases when the patient rests sitting up in bed, and

may cease to vomit throughout her stay in hospital, thus testing the credulity of her medical attendant.

A radiologist needs skill and experience to demonstrate a hiatus hernia. Resolution is rapid in the puerperium, and attempts to make a post-partum diagnosis may be unsuccessful because of the diminution in size of the hernia, or even its disappearance. Rigler and Eneboe (1935), Bourgeois and Hood (1949), and Schnepf (1943) all commented on this feature, our experience of which has been similar.

It is not intended to claim that hiatus hernia always causes trouble in pregnancy, or that such a hernia is always responsible for heartburn, vomiting, or haematemesis. We have seen cases illustrating the contrary.

It would seem that there is a need for a large-scale investigation to ascertain the role of hiatus hernia in heartburn and vomiting of pregnancy.

Summary

The association of hiatus hernia with pregnancy is described.

Nine cases with symptoms attributed to a hiatus hernia in pregnancy are reported.

The literature is briefly reviewed.

The need for further investigation is recognized.

We wish to thank Dr. J. M. Naish, Mr. W. M. Capper, Mr. P. Phillips, and Professor H. J. Drew Smythe for permission to publish these cases, Professor G. Gordon Lennon for helpful advice and criticism, and Dr. G. R. Airth, who performed most of the x-ray examinations.

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In his annual report the Medical Director of the Central Middlesex Hospital, Dr. Horace Joules, states that despite efforts to reduce the surgical waiting-list it still stands at well over 1,000. This number had been somewhat lessened by the co-operation of several other hospitals which had taken over large numbers, but last winter's fog and the subsequent high incidence of influenza had caused such a demand for acute admissions that the number waiting for surgery had risen to its previous height. Dr. Joules said that it was known that several London hospitals had practically no waiting-list, and he suggested that the time had come to evolve some system of transfer of cases for elective surgery between one hospital and another. A committee had been set up to inquire into the out-patient position, and had agreed that any further increase in numbers must be avoided. Closer association between practitioners and the hospital had been maintained by meetings of local health liaison committees and clinical meetings and courses. The opening of a new mass x-ray unit, domiciliary visiting, and the provision of additional beds had ensured early treatment of new cases of pulmonary tuberculosis. The association with the Middlesex Hospital had been strengthened by an agreement to continue undergraduate teaching at the Central Middlesex Hospital for a further 10 years, and by a scheme to exchange senior registrars after they had two years' experience in their own hospital.

TREATMENT OF TETANUS

BY

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In an article on tetanus successfully treated with gallamine triethiodide ("flaxedil") Smith and Thorne (1952) advocate the use of this drug. They state that relaxation is secured on a steady level and that respiratory depression is less marked with gallamine triethiodide than with D-tubocurarine, especially in the conscious subject. It is to be noted, however, that the period elapsing between the infecting injury and the onset of symptoms in their case was at least ten days, so that the prognosis would be relatively good.

Recently we have had in this hospital two cases of severe tetanus in children in which the periods elapsing between injury and the onset of symptoms were under a week, being in one case four days and in the other six days. Both of these children died, one in 24 hours and the other in three days, despite treatment with gallamine triethiodide and the usual treatment with sedation, antitoxin, and antibiotics. Gallamine was not conspicuously successful in either of our cases in relieving spasm, although used in much the same doses as in the case of Smith and Thorne, and, in addition, we found it apt to cause respiratory embarrassment.

Case 1

A girl aged 4 was admitted to Grey Hospital on December 12, 1952. The mother stated that the child had cut her left thumb in the garden on some glass six days previously. She now complained of neck stiffness and was unable to open her mouth. On the morning of her admission facial spasm became apparent. On examination the pulse was 120 and the temperature 98.4° F. (36.9° C.), although this rose to 102° F. (38.9° C.) within a few hours. The mouth could not be opened more than about 0.5 cm. Risus sardonius was present. Some stiffness of the muscles of the back was apparent, and within an hour of admission two spasms occurred. On the child's left thumb a deep infected laceration was seen.

A diagnosis of tetanus was made and 20,000 units of antitoxin was given, followed by a further 60,000 within six hours. Crystalline penicillin in doses of 500,000 units, later increased to 1,000,000, was given six-hourly. As further spasms were occurring an intravenous saline drip was set up and 5 mg. of gallamine was given intravenously and 20 ml. intramuscularly. This caused a temporary cessation of respiration, and mucus had to be removed with a suction apparatus. The pulse remained steady throughout the episode. Oxygen was given by nasal catheter, and the child recovered sufficiently to talk. About one hour later two further tetanic spasms occurred, which necessitated the addition of 1 ml. of thiopentone to the drip, and gallamine was required. Despite this, several convulsions occurred. As additional sedation 30 ml. of alcohol was introduced into each vacoliter, limited to two vacoliters daily. On the third day (December 15) the child had an exceptional severe convulsion and died. Immediate restorative measures failed, as also did cardiac massage for one hour. Through out, the child was "specialised" by the medical staff.

A total of 27 ml. of thiopentone and 350 mg. of gallamine was given in the three days that the child lived. In addition 4.5 ml. of paraldehyde was also given, and intravenous alcohol. Despite this treatment she had convulsions of moderate or less severity, on an average twice or three times an hour. Respiratory embarrassment occurred seven times, and

on occasions artificial respiration was necessary. Oxygen was often required. Mucus in the air passages was very troublesome and required frequent suction. Some 180 mg. of gallamine was given intramuscularly and 170 mg. intravenously; the doses varied from 5 mg. intravenously to 20 mg. intramuscularly. *Clostridium anti* was grown from swabs taken from the wound when was cleaned.

Case 2

On January 22, 1953, a boy aged 7 was admitted to Grey Hospital. He was quite rigid, was unable to open his mouth, and was perspiring freely. He complained of abdominal pain, and the muscles of the back were very rigid and in spasm. His parents gave a history of his having jumped into a spike of wood in the grass four days previously. The wound had healed. The boy was quite conscious; his temperature was 99.2° F. (37.3° C.), and pulse 140. He was given 40,000 units of antitoxin, and as clonic spasms were most continuous a slow intravenous saline drip was set up and 40,000 units of antitoxin and 80 mg. of gallamine were introduced into each vacoliter. In addition 1,000,000 units of penicillin was given four-hourly. Thiopentone, 0.5 ml., was given as an initial sedative into the tubing of the drip. A dose of 80 mg. of gallamine in the first vacoliter and 40 mg. in subsequent vacoliters was decided upon. Later it was found necessary to give additional gallamine intravenously, the dose being relatively small. Later it was found necessary, however, to increase the dose of gallamine to 80 mg. and finally to 120 mg. in each vacoliter.

Atropine sulphate, 1/200 gr. (0.32 mg.) intravenously, had previously been administered, but even so his breathing became very bubbly. A further 1/200 gr. (0.32 mg.) of atropine was given. For the first few hours the convulsions were relatively few, but as time went on they increased in number and severity, so that 10 hours after admission he was having almost continuous clonic convulsions, and anaesthetic doses of thiopentone were required. Although he was in hospital for only some 23 hours before he died, he had numerous mild and many severe spasms. A total of 29.5 ml. of thiopentone and 404 mg. of gallamine was given intravenously in an effort to suppress his convulsions. This in addition to antitoxin, 80,000 units, and penicillin, 1,000,000 units four-hourly. Although his breathing was very bubbly, respiration was not arrested and no artificial respiration was required. The boy died the morning after admission, death being due to sudden heart failure.

Discussion

These two cases do not make impressive reading. They tend to bear out the axiom that tetanus occurring within a week of injury is invariably fatal. In the first instance we had the impression that gallamine caused some respiratory embarrassment, but this was not confirmed in the second patient, who was, however, desperately ill on admission.

Abel (1934), in a study of the path of conduction of the toxin to the central nervous system, indicates that this occurs by way of the blood stream. He also suggests that the tetanus toxin is altered into or liberates in the cord a substance which has a lethal effect on the vital centres.

The dose of sedatives could not be reduced in either of these two cases without causing severe suffering. Penicillin, even in doses of 1,000,000 units four-hourly, did not seem to affect the course of the disease. Antitoxin serum in doses of 80,000 units in the first twelve hours likewise seemed to have little effect.

It can only be concluded that the present methods of treatment of tetanus in cases occurring within a week of injury are ineffective, and that, in view of the fact that 35 cases of tetanus occurred in New Zealand last

year, recourse should be had to the routine active immunization of all children against tetanus.

I bring these cases to the notice of the public health authorities, both in the United Kingdom and in New Zealand, as so often in minor injuries one is in doubt whether the injury requires a prophylactic injection of antitoxin or not. In view of these two fatal cases it would seem to be worth while to include antitetanic inoculation at the same time as routine immunization against diphtheria is being carried out.

My thanks are due to Dr. B. M. Dallas, Dr. E. E. Tilson, and Mr. S. Barclay, the surgeon superintendent—the last-named for his efforts at resuscitation of Case 1. I also thank Mr. B. Heine and Mr. R. D. Lockhart for their constant attention to these cases.

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Medical Memoranda

Stasis of the Large Bowel Secondary to Acute Cholecystitis

It is generally recognized that acute inflammation of the gall-bladder may be accompanied by upsets of large-bowel function leading to distension and constipation; the extreme degree to which distension may proceed, simulating large-bowel obstruction, is worthy of greater emphasis than it usually receives, and is well illustrated by the following two cases.

CASE 1

A married woman aged 72 had been operated on four months previously for a strangulated right inguinal hernia, and had made a smooth recovery. Two days before her present admission she had had an attack of vomiting, during which she had been examined at a London teaching hospital but had not been detained. She complained of abdominal pain of two days' duration which was situated mainly in the right side of the abdomen. There was anorexia and she had passed neither faeces nor flatus for three days.

On examination her temperature was 101° F. (38.3° C.), pulse 110, and blood pressure 130/80. The tongue was furred. The abdomen was distended, with maximal and marked distension in the right flank; the caecum was palpable, and above this was a tender mass. Rectal examination was negative. A plain x-ray film of the abdomen showed much distension of the caecum and ascending colon. The diagnosis was thought to lie between an attack of acute cholecystitis and a perforated carcinoma of the ascending colon; in view of the attack of vomiting two days earlier the former was considered more likely.

Operation.—A right paramedian incision was made. The caecum and the ascending colon were distended to at least twice their normal size, but there was no organic obstruction. The distension extended to that portion of the ascending colon which lay in contact with an acutely inflamed distended gall-bladder; gall-stones were present. Cholecystectomy was performed and the abdomen closed with drainage. The patient made an uneventful recovery.

CASE 2

A married woman aged 80 had had attacks of abdominal discomfort associated with distension and relief by the passage of flatus during the past year. She had had abdominal pain for three days; the pain was mainly in the lower abdomen and was described as being "windy" in character. She was constipated and had not passed flatus for three days. Her abdomen felt as if it had become "blown-up." There had been some retching but no vomiting.

On examination her temperature was 98° F. (36.7° C.), pulse 112, and respirations 24. The tongue was moist.

The abdomen was tensely distended, maximally in the sub-umbilical zone, which was very prominent, tight, and tympanitic. Some degree of tenderness was present in the mid-line below the umbilicus. Intestinal sounds were heard. The release phenomenon was absent and Murphy's sign was negative. There was no jaundice. Some constipated faeces were found in the rectum; there was no pelvic tenderness. A plain x-ray film of the abdomen showed distension of the large bowel round to the sigmoid colon distally. The suspicion of an inflammatory lesion was aroused, but in view of the negative Murphy sign it was thought that the appendix would be the seat of the inflammation if the diagnosis of large-bowel obstruction was proved incorrect and an inflammatory lesion was present.

Operation.—A right paramedian incision was made. The large bowel was distended as far as the sigmoid colon, but there was no organic lesion in it. The gall-bladder was acutely inflamed; an area close to its fundus was near to gangrene. Cholecystectomy was performed. The gall-bladder contained numerous small pigment calculi. The abdomen was closed with drainage.

COMMENT

The extreme degree of abdominal distension made this the most prominent physical sign in each of these cases of acute cholecystitis. The presence of marked distension together with constipation in patients aged 72 and 80 years makes one incline towards a diagnosis of large-bowel obstruction. In Case 1 the correct diagnosis was considered, but in Case 2 it was excluded as Murphy's sign, which was specifically tested, was negative. In this case the degree of distension was quite remarkable and was not regarded as likely to be produced by anything save mechanical obstruction, especially as intestinal sounds were heard on auscultation.

Most of the standard textbooks of surgery make passing mention of bowel distension and constipation when discussing acute cholecystitis, but the extreme degree, with its misleading implications, to which this may proceed is not emphasized enough. Kiely (1949), however, includes intestinal obstruction in his differential diagnosis of acute cholecystitis. The larger books naturally make more mention of the condition. Aird (1949) writes: "There is a flatulent distension of the right side of the abdomen after 36 to 48 hours (Wilkie), and sometimes the whole right side is tense." Maingot (1948) also mentions distension of the caecum and ascending colon; his further comment, "While in others the ballooned caecum may suggest a diagnosis of acute retro-caecal appendicitis or obstruction of the large intestine," is particularly apposite in regard to Case 2, in which these diagnoses were considered to the exclusion of that of acute cholecystitis. Finally, Morley (1947) writes: "Owing to the reflex inhibition of intestinal movements there is constipation and considerable distension, most marked in the colon."

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Comparison of the Male Toad and Hogben Pregnancy Tests

Numerous papers have been published showing the reliability of pregnancy tests on toads, but none which compared the Hogben test with the male toad test. Although male toad tests are in common use in other countries there seems to be an impression in this country that it is less accurate than the Hogben test. The figures given below suggest that it is equally reliable and has several advantages.

Methods.—Early morning urine is concentrated by Scott's method (1940). Then 2.5 ml. of the concentrate is injected

subcutaneously into a female *Xenopus laevis* toad and 2 ml. into a common British male toad (*Bufo bufo*). Three hours after injection urine is obtained from the cloaca of the male toad with a blunt Pasteur pipette and examined microscopically for spermatozoa. One male toad is tested. The jar containing the *Xenopus* toad is inspected the following morning for eggs. If the result is negative a second toad is injected and the test read on the following day. If this result is positive the negative result on the first toad is discounted (Landgrebe and Hobson, 1949).

RESULTS

Both Hogben and male toad tests positive	181
"Negative" Hogben, "positive" male toad test	200
Positive Hogben, negative male toad test	19
	0

In over 95% of cases both tests gave the same result, and in no instance was the Hogben test positive and the male toad test negative. Of the 19 cases in which the male toad test was positive and the Hogben test was negative, 18 proved to be pregnant. Seven were early pregnancies, and the Hogben test later became positive. Two were late pregnancies, in the fifth month. One case had a history of several miscarriages, but did not abort in the present instance. Eight patients aborted a few days after the test. The nineteenth patient was not pregnant, but had a fibroid; the Friedman test was negative; after removal of the fibroid the male toad test was negative. A Friedman test was done on 6 of these 18 cases, and was positive in all.

The results strongly suggest that the male toad test can detect a lower level of gonadotrophin in the urine than the Hogben test, as shown in very early pregnancy, late pregnancy, and impending abortion, in all of which conditions the urinary gonadotrophin is probably low. The number of impending abortions detected by a comparison of the tests is striking.

ADVANTAGES OF THE MALE TOAD TEST

1. Comparison with the Hogben test shows it to be equally accurate and, in fact, more sensitive.
2. The test can be read in three hours. The Hogben test takes 24 hours, and if the first toad is negative a result cannot be given for 48 hours.
3. Only one toad is required. In a random series of 200 Hogben tests performed in three months in this laboratory, 16 gave a negative result on the first toad and a positive result on the second. That is, an error of 8% would have occurred by using one toad only.
4. Male toads are useful for dilution tests for a suspected hydatidiform mole. Half a dozen toads can be injected at the same time with different dilutions, read after three hours, and the appropriate dilution injected into a rabbit on the same day. The unreliability of the reaction of the *Xenopus* toad and the time it takes to react compare unfavourably with the male toad for this purpose.
5. The cost and trouble of maintaining male British toads are much less than for *Xenopus* toads. Their initial cost is much lower and the necessary equipment much cheaper. The care of the male toad is simple (Law, 1949). As only one toad is used for a test, and it can be used again within a week if necessary, a much smaller stock of male toads than of *Xenopus* toads is required for the same annual number of tests. The male toad pregnancy test is within the scope of the smallest laboratory.

I wish to acknowledge my gratitude to Dr. M. Haines and Dr. H. P. Ferreira for demonstrating the technique of the male toad test.

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Reviews

SURGICAL TREATMENT OF CHILDREN

The Surgery of Infancy and Childhood: Its Principles and Techniques. By Professor R. E. Gross, M.D., D.Sc. Drawings by Etta Piotti. (Pp. 1,000; 1,488 illustrations and 567 figures. 80s.) Philadelphia and London: W. B. Saunders Company. 1953.

This is a most important and useful book—and incidentally, as prices go nowadays, remarkably good value for money with its great size and lavish illustrations. No surgeon who treats children should be without it. In it are recorded the methods and results of one who has unrivalled experience in certain directions, and who in addition is one of the greatest of surgical technicians. It is an extremely personal work, the author giving his own opinions and experiences, seldom wasting time in quoting those of other people. The writing is simple and clear, without that polysyllabic pomposity that is the besetting fault of so much American medical writing. There is a notable absence of vague and oracular statements and of unsubstantiated opinions: in fact, the only ones I have noted are in the very small part of the book not written by Dr. Gross himself. The book is inevitably incomplete, since no man can cover the whole of surgery, even if limited to one age group. There is nothing about orthopaedics, about the nervous system, about hare-lip and cleft palate, tonsils and adenoids, or lymphatic glands. This must have caused the author some difficulty in deciding on a title; a difficulty which another great individualist, H. O. Thomas, solved by putting out much of his work as "Contributions to Medicine and Surgery."

On the surgery of the digestive and circulatory systems of the young this book is at present supreme. It is so because of the combination of Dr. Gross's qualities and the American habit of hustling special cases to special centres, in contrast to the British one of treating them locally. The really remarkable results set out could be obtained in no other way than by this concentration of cases under the care of a highly specialized and skilled team. The opinions of Dr. Gross on his own situation are not very easy to make out. He is against adding paediatric surgery to the number of officially recognized specialties; and when we consider the closed-shop mentality and the rather bogus mystique that characterize some of them we see his point. On the other hand, he considers that "our larger communities and many of our academic centres can support a group who are particularly interested in these problems." If this means that there should be paediatric surgeons, but not many of them, and that they should try to set a standard rather than establish a monopoly, the reviewer cordially agrees.

There is a short but sound section on anaesthetics, in which it is interesting to note that the fashionable use of muscle relaxants is strongly condemned and the opinion given that they have no place in the surgery of the young.

Excellent as this book is, there is no doubt that it would be improved by taking notice of work done outside the United States on the rapidly developing section of surgery of which it treats. Those who work elsewhere on similar lines must feel a longing to raise many questions and discuss many points. What, for instance, is the explanation of 20% of failures in that simple ligation of the ductus arteriosus which is found so satisfactory in Britain? Is the reason for not using the "intussusception-prolapse" technique, which we find cuts an hour off the time of recto-sigmoidectomy for Hirschsprung's disease, ignorance of the technique published in England long before the much clumsier device of Hiatt to which the author gives a reference?

If they are not unaware of what is happening in England and Sweden, how is it that in Boston they are satisfied to give a sufferer from hypospadias the power of urinating normally only at the age of 15 years or more? Is there any objection to the conception of the "covered anus"

and the "ectopic anus," which workers here have found so helpful in classifying and treating deformities in this region? Dr. Gross, as a result of much investigation, holds that hormone therapy is useless in treating undescended testicles, but would not this opinion be strengthened by reference to the anatomical work on which it can be securely based? And on the subject of anatomy, why not set out exact indications for the extent of Rammstedt's operation, which may not be needed by anyone of the experience of Dr. Gross, but which can be very helpful to the less expert?

I have read this book with great admiration and benefit—but, it must be admitted, with occasional irritation at its insularity.

DENIS BROWNE.

SPLENOMEGALY

Hypersplenism and Surgery of the Spleen. By William Dameshek, M.D., and C. Stuart Welch, M.D. (Pp. 84; illustrated. \$10.) New York: Grune and Stratton, Inc. 1953.

This book is highly original in its presentation, content, type, illustrations, and binding, but it is a convenient book to handle and a most valuable one to browse through. Its pages are of card and each page gives a diagram or table with a few explanatory phrases. It is really a bound pictorial demonstration of the American Medical Association exhibit on the same subject which was awarded the Billings Silver Medal in 1950. The authors clearly and succinctly demonstrate the anatomy, histology, and physiology of the spleen, and diagrammatically present the evidence for splenic hormones. They list in a table of names and dates the historic development of our understanding, such as it is, of splenic anaemia and other forms of splenomegaly, and they detail and criticize in the clearest possible fashion the nomenclature of those splenomegalies which are accompanied by cytopenia. The symptoms of hypersplenism, as the authors interpret the term, and the results of treatment, with diagrams and coloured photographs of the operation, are presented in the same tabular way, and the authors also consider haemolytic anaemia and thrombocytopenic purpura. There is a fully classified list of the causes of splenomegaly and the method of investigation of splenomegaly is covered too.

Having read the book, one feels that one has attended a lecture, beautifully illustrated by lantern slides, but given by an inaudible lecturer. I have the impression that it would be a difficult book for a student or a general practitioner to study with the purpose of learning about the diseases of the spleen that it covers, but it is an admirable synopsis of facts about the spleen and would provide valuable lecture illustrations for a teacher of undergraduates.

The chief interest of the book is in the technique of its presentation. Anyone interested in medical books or medical education should try to find access to it (its cost is 10 dollars). Among other attributes it possesses that of showing how a complicated case history can be reduced to 100 words and a diagram without loss of accuracy or detail.

IAN AIRD.

CHEMOTHERAPY

The Sulphonamides and Antibiotics in Man and Animals. By J. S. Lawrence, M.D., M.R.C.P., and J. Francis, M.Sc., M.R.C.V.S., with the assistance of A. Sorsby, M.D., F.R.C.S., and P. G. Scott, F.R.C.S. Second edition. (Pp. 482; 38 figures. £2 2s.) London: H. K. Lewis. 1953.

This book is described as a second edition, but since it was previously Lawrence's *The Sulphonamides in Theory and Practice* it is better regarded as a new book. It follows the usual plan of describing first the properties of individual drugs and then discussing their use in the treatment of different kinds of disease. The earlier chapters on the sulphonamides are excellent, and together with the glossary of trade names in the appendix will enable the reader to sift the truth from the present-day flood of advertising matter in this connexion. On the other hand, these drugs are overdone in some parts of the text. It is surely

not worth while nowadays to devote nearly five pages to the sulphonamide treatment of otitis media. They also figure largely in the section on peritonitis, which cites no authority later than 1947.

It must be difficult, particularly for four authors in Manchester, Brisbane, London, and Exeter respectively, to produce an up-to-date book on so rapidly developing a subject, and, although isoniazid has just got in (in the appendix), other recent work is missing, and parts of the book "date" to several years ago. There is also some understandable lack of correlation; aureomycin is "rarely" bactericidal on page 17 and "bactericidal in therapeutic concentrations" on page 146, and *Ps. pyocyanea* on page 154 becomes *Ps. aeruginosa* on page 268. The bibliography runs to 41 pages of references, and much of the text seems a rather uncritical compilation. The reviewer is quoted as having stated that penicillin has reduced the mortality of actinomycosis from 30 to 20%, but the authors do not mention that this referred only to the thoracic form of the disease. (He also, by the omission of an initial, becomes two different people in the reference list.) There is no discussion of synergism and antagonism between antibiotics, and a lack of emphasis on the present inconstancy of bacterial sensitivity, particularly to the newer drugs. It is useless nowadays to prescribe by rule-of-thumb methods, particularly for chronic infections of the air passages or urinary tract. Laboratory tests are an essential guide to successful treatment, and a statement to the contrary made in the preface should have been amplified or explained in the section describing such tests.

It is inevitable that a book on what is now so vast a subject should be incomplete. Despite its omissions, this is a useful work of reference, as well as a generally reliable guide to therapy for the general practitioner, some specialists, and the veterinarian.

L. P. GARROD.

MEDICINE IN THE U.S.S.R.

La Médecine en U.R.S.S. By Dr. I. Lazarevitch. Preface by Dr. Jean Paraf. (Pp. 217. No price given.) Paris: Les Iles d'Or. 1953.

The great merit of this book is its objectivity. Written by a woman doctor of Russian birth but trained in France, it covers every aspect of Soviet medicine and is based entirely on recent official documents. It is impossible to describe here the details of organization, but the general impression left on the reader is that of a gigantic bureaucratic system planned on paper to the last detail but in practice failing in co-ordination and showing more regard for Communist ideology than for either patient or doctor. But there are some principles underlying the plan which indicate—to a Western mind at least—why it cannot work.

The first three chapters are devoted to an examination of what may be called the "Pavlov Creed," which by an official decree must dominate every branch of science, especially medicine. Many university professors have been deprived of their office and publicly denounced because they have shown independence of thought. It appears that certain theories propounded by Pavlov, who died in 1937, have been adopted by the Party as sacrosanct. The effect of this is that there is growing up a generation of medical teachers not free to question these theories, and of practitioners who are not allowed to know that in the view of scientists outside Russia no theory is sacrosanct. Moreover, in the *Meditsinski Rabotnik* of October, 1951 (official journal of the Ministry of Health), appears the following statement: "One of the essential duties of Soviet medicine is to establish the primacy of Russian savants in the different domains of medical science." Many examples are given in the book of the ridiculous claims that have been made in obedience to this decree. They must be seen to be believed.

There are some queer anomalies in the system. For example, the columns of the official medical journal seem to be open to severe criticism of the administration. Again, all doctors on qualification are immediately assigned to posts in various parts of the vast Soviet territory. There is no question of choice, and frequently the doctor on arrival finds the place very uncongenial and quite often no

arrangements have been made for his accommodation. The result is that a considerable percentage of those assigned leave without permission. As there is no private practice in the Soviet it is difficult to understand what happens to these doctors. I can cordially recommend this book to anyone who wants to know what a really planned bureaucratic medical service is like.

ALFRED COX.

ENZYMES AND ANAPHYLAXIS

Enzymatic Concept of Anaphylaxis and Allergy. By Z. Z. Godlowski, M.D. (Cracow), Ph.D. (Edin.), M.R.C.P. (Edin.). Foreword by Professor A. Murray Drennan, M.D., F.R.C.P. (Ed.), F.R.S. (Ed.). (Pp. 120; 17 figures. 15s.) Edinburgh and London: E. and S. Livingstone. 1953.

Dr. Godlowski's theory is that, in the process of sensitization to an antigen, specific proteases are formed in certain cells. These enzymes will break down only the specific antigen, and break this down only to the stage of toxic proteoses.

The nature of the reagin, in the serum of allergic patients, that produces the Prausnitz-Küstner reaction is indeed a problem. Any theory should be considered, even when it postulates highly specific proteolytic enzymes which have not been shown to exist. But Dr. Godlowski also applies this theory to anaphylaxis, including passive anaphylaxis. The quantitative work of Kabat and his colleagues has shown that the sensitizing agent in passive anaphylaxis is almost certainly ordinary antibody.

In the second part of the book Dr. Godlowski maintains that certain eosinophilic cells are formed in the intestinal mucosa after absorption of foreign protein. The evidence for this is unconvincing and no explanation is given of the acquired affinity for eosin.

Some of the statements in the book are questionable: it is usually supposed that no breakdown of protein occurs in lysis, such as lysis of red blood cells by specific antiserum and complement (p. 5); there is no evidence to suggest that agglutination is due to the viscosity of newly formed protein molecules localized on the surface of bacteria or cells (p. 5); the definition of a haptene (p. 4) is wrong.

J. R. MARRACK.

ABERRANT BEHAVIOUR

Encyclopedia of Aberrations. Edited by E. Podolsky, M.D. Foreword by Alexandra Adler, M.D. (Pp. 550. Price \$10.) New York: Philosophical Publications. 1953.

The sketches of corsets and high-heeled shoes on the dust-cover and the title of the book suggest, and presumably are meant to suggest, that this is a comprehensive work on sexual deviations. This might be permissible on the hypothesis that the neuroses and all other mental disabilities are caused by disturbance in the development of the sexual function. But the validity of this hypothesis is not claimed, and sexual, social, religious, sensory, and other types of "aberrational behaviour" are described. The subjects chosen are dealt with by providing a simple definition or, when detailed consideration is called for, by reprinting an article previously published in a psychiatric journal. The selected articles are by representatives of the Freudian discipline of psycho-analysis.

The word "encyclopedia" is clearly inappropriate, as the terminology used by non-psycho-analysts is left out entirely. But even the psycho-analysts may complain about the omissions and so may "the intelligent laymen as well as the expert in interpersonal relations" whose requirements the editor has in mind. Transference, insomnia, sleep walking, trance states, impotence, vaginismus, and neurosis are forgotten. The number of neologisms is remarkable. Triakadekaphobia (irrational fear of the number 13), hade-phobia (the delusion that one has committed the unpardonable sin), and philonasm (obsessive interest in fads) are examples. The hotch-potch of good and bad, fact and theory, contained in this expensive volume has little value for the general physician or psychiatrist who possesses a reliable medical dictionary.

E. A. BENNET.

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CHRONIC GASTRIC ULCER

In their important review of the treatment of chronic gastric ulcer published this week in our opening pages, Dr. B. F. Swynnerton and Mr. N. C. Tanner stress the importance of considering gastric and duodenal ulcer separately. There is much to suggest that different factors are concerned in the causation of gastric and duodenal ulcer, and certainly their surgical treatment presents different problems. To provide an authoritative opinion in this field needs a particularly wide personal experience, and there are few centres where one individual has been responsible for nearly 500 patients with chronic gastric ulcer over seven years. This was possible in Mr. Tanner's gastric unit at St. James's Hospital.

Swynnerton and Tanner report a series of 498 patients with chronic gastric ulcer treated between 1940 and 1946. Of these, 262 had medical management after an active chronic ulcer had been diagnosed gastroscopically, while in the surgical series there were 254 patients; 18 patients appeared in both series. The posterior aspect of the upper part of the lesser curve was found to be the position of predilection for gastric ulcer in women, and ulcers in the pyloric antrum and canal constituted only 0.8%, as compared with 13.5% among men. In both sexes ulcers were found much more commonly on the posterior, rather than on the anterior, aspect of the lesser curve.

In the surgical series partial gastrectomy was the operation of choice initially with an antecolic Polya-Hofmeister, but this has now been replaced by the Billroth-I type, an operation which is considered a simpler and perhaps more physiological procedure. The surgical mortality for the whole series was 6.3%, but most of these deaths occurred during the first five months of intensive night bombing on London, and in the last 350 cases on which Mr. Tanner has performed partial gastrectomy there have been only four operative deaths, an incidence of just over 1%. This is a particularly fine record, for they include thirty-eight emergency operations for haematemesis.

¹ Swynnerton, B. F., and Truelove, S. C., *British Medical Journal*, 1951, 2, 1243.

² Cain, J. C., et al., *J. Amer. med. Ass.*, 1952, 150, 781.

A careful follow-up was organized and information obtained from all but fourteen patients—a remarkable achievement. Sixty-one patients in the medical and sixty-six in the surgical series had died since their initial stay in hospital; seven deaths were due to cancer of the stomach, nine to tuberculosis, and the remainder to a wide selection of diseases. Among the survivors in the medical series, 32% had undergone gastrectomy for troublesome relapses and only one-quarter had remained free from symptoms. Among the surgical cases, out of every ten patients still alive the results had been satisfactory in eight, moderately successful in one, and poor in one. Among the unsatisfactory cases there were often severe associated medical conditions, such as chronic bronchitis and angina pectoris. Analysis shows that at St. James's Hospital partial gastrectomy is the most satisfactory treatment of chronic gastric ulcer available at present; it is indicated except in those patients with a short history or with troublesome concurrent diseases. It is interesting to note that Swynnerton and Tanner are not convinced that partial gastrectomy increases the risk of pulmonary tuberculosis. The evidence from the literature clearly points in this direction, and further studies are needed.

The experience of this series does not lend any support to the view that simple gastric ulcer is liable to malignant degeneration. The view is increasingly held, at least in Britain, that most so-called "ulcer-cancers" are, in fact, "cancer-ulcers," the initial lesion being a malignant degeneration with a secondary ulceration. In a previous paper¹ Swynnerton and Truelove showed that the sites of these ulcers conform with the distribution of carcinoma of the stomach and not with that of gastric ulcer, the majority of them being prepyloric in situation. But many workers in the U.S.A. still insist that a gastric ulcer carries a 10% chance of malignancy. While a safe distinction cannot be made by examining the peritoneal surface during operation for perforation, in ordinary clinical practice the combination of careful radiology, aided when necessary by gastroscopy, can safely distinguish between the two. Radiologically, an ulcer cleanly projecting from the lesser curve above the angulus is virtually never malignant; the differential diagnosis arises when the ulcer is situated within the line of the lesser curve. Size is of no real significance, small lesions often being among the most suspicious.

In reviewing the cases of gastric carcinoma which had developed during the follow-up, Swynnerton and Tanner did not consider that there was any evidence that they had begun as ulcer-cancers. They con-

cluded that, if there is an association between gastric ulcer and gastric carcinoma, it is because both lesions are apt to develop in the same type of degenerative mucosa. There is certainly some evidence that patients who have suffered from gastric ulcer are more liable subsequently to develop gastric carcinoma. Cain and his colleagues,² in a series of 414 patients followed up for five years after medical treatment of gastric ulcer, found that 4.9% had developed gastric carcinoma, an incidence which is many times greater than among the general population. From the histories it seemed highly probable that many of the carcinomas were unrelated to the original ulcer. Again, the removal of the ulcer by partial gastrectomy does not confer immunity from subsequent malignant disease. An interesting feature of the American series is that the proportion of completely successful cases treated medically, 20%, is almost identical with Swynnerton and Tanner's figure of 23.6%. The proportion of medically treated cases subsequently coming to surgery was also remarkably similar in the two series, being 32% and 33.8%, east and west of the Atlantic.

In spite of these impressive figures it is doubtful if it would yet be generally accepted that gastric ulcer is essentially a disease that must have surgical treatment, for there are many patients in whom gastric ulceration is an occasional episode. This is particularly true of cases of acute gastric ulcer, in which the prognosis, especially in women, is far better than with chronic ulcers. Although a high proportion of patients treated medically may have subsequent relapses, yet a high proportion of their follow-up years are entirely free from symptoms. For a persistently unhealed ulcer there can be no doubt at all that surgery is the correct treatment, but most clinicians would still prefer to give every patient with gastric ulcer an initial chance to respond to medical treatment, and indeed it is surprising how many may heal while on a hospital waiting-list. It is not uncommon for an ulcer to develop after physical or mental stress, particularly if associated with under-nutrition or some other disease, such as bronchitis. In these circumstances there is often much which can be done by the physician together with the almoner in improving the patient's circumstances and getting him readjusted to his individual problems.

There are many diseases in which the best results in any series of cases are achieved only by close co-operation between physician and surgeon. This is especially true of hypertension, thyrotoxicosis, ulcerative colitis, and peptic ulcer. In these condi-

tions the decision to operate should be agreed on by both the physician and the surgeon. The value of such co-operation is also to be seen when physician and surgeon collaborate in the analysis and publication of the results of treatment, as they have done in this series.

STATISTICS AND MEDICINE

The vital statistics of this country—and indeed of the world—owe much to the genius of Dr. William Farr, medical statistician at the General Register Office from 1839 to 1879, and it is fitting that in Somerset House has been held this week the first World Health Organization Conference of National Committees on Vital and Health Statistics, under the presidency of Sir Russell Brain. National committees on vital and health statistics are of recent origin. They were first suggested in 1948 at the Sixth Decennial Revision Conference of the International List of Diseases and Causes of Death, when it was recommended that governments establish such committees for the purpose of co-ordinating statistical activities within their own countries and to serve as links between national medical-statistical institutions and the World Health Organization. These national committees would have the function of studying broadly the problem of producing satisfactory national and international statistics in the field of health. National committees have now been established in some twenty-five countries, and a number of others, including Britain, though lacking a formal national committee, have co-ordinating bodies and arrangements that amount to much the same thing.

The conference, attended by delegates from some thirty countries and international organizations, and with the United Kingdom strongly represented, has been discussing the structure and functions of these national committees. In addition it has devoted time to questions such as the types of health statistics essential to countries at different stages of development, how those statistics are to be obtained, and what part W.H.O. ought to play in this connexion. Other topics discussed have been the extent to which health statistics might be obtained by sampling rather than by more traditional methods, and the national implementation of international regulations on vital and health statistics, particularly in relation to death certification and the classification of diseases.

The conference has been dealing with topics somewhat remote from clinical medicine. Indeed, it is a criticism sometimes made that vital statistics in general provide little of interest or of direct value to the majority of medical practitioners. There is

no doubt an element of truth in this, for the general practitioner and the hospital consultant, going about their daily affairs, find little need to delve deeply into national and local vital statistics. Statistics are unpopular but necessary: they are troublesome to collect and compile, some of them are difficult to understand without the requisite training, and they have a habit either of failing to provide a convincing answer to the question asked or, worst sin of all, of contradicting preconceived ideas and long-held beliefs. Moreover, not even the most enthusiastic advocate of vital statistics would claim that statistical tables of births, marriages, and deaths make exciting reading. Yet vital statistics are not a mere academic luxury. They have a very real practical value in almost every field of medicine. A knowledge of prevalent infectious diseases and causes of death, for instance, is useful to most doctors, and may be gained from a scrutiny of the vital statistics section in this *Journal* each week.

One of the topics discussed at this W.H.O. conference was how to secure a wide appreciation of the value of vital statistics and how to obtain the co-operation of those who could supply needed data. Perhaps the answer lies not only in giving medical students instruction in statistics, their sources, their value, and their limitations—as suggested by Professor Bradford Hill at the recent First World Conference on Medical Education¹—but also in trying to present vital statistics in a way that will appeal not only to statisticians but also to medical men, who are after all the people most concerned with the true import of those statistics. We are frequently reminded that, when undertaking a piece of research likely to require statistical analysis, the medical worker should consult a statistician at the beginning rather than at the end if effective collaboration is to be achieved. But the opposite also holds, and in the preparation and presentation of vital statistics, and indeed also in presenting the results of any investigation requiring statistical analysis, the statistician must likewise in turn seek medical advice, and ensure that what he is offering is of direct value to medical people and can be readily understood by them.

We have been fortunate in this country that our national vital statistics have all along been prepared under the supervision of men with a medical as well as a statistical training. The Statistics Division of W.H.O. also enjoys this advantage, but many national statistical offices are less fortunate, and have to rely on statisticians without medical qualifications. Unless these statisticians obtain the best possible medical advice, their contribution will not properly fulfil the

requirements of the medical profession whom they hope to serve. Vital statistics are essentially a medical rather than a statistical exercise; the medical profession supplies much of the basic data, and is the principal consumer of the resultant statistics: its tastes and needs must be consulted in deciding what statistics ought to be prepared and how they should be presented.

HEARTBURN IN PREGNANCY

The pregnant woman and her doctor do not always see things in the same perspective, and what the doctor considers a minor discomfort his patient may regard as a major affliction. This is particularly true of heartburn, which in some degree harasses two out of every three pregnant women. Formerly this symptom was blamed on hyperchlorhydria, but alkalis give inconstant relief, and in most pregnant women there is a notable reduction in the free and total gastric acidity, particularly during the second trimester.¹ Latterly, therefore, heartburn has been treated with small doses of dilute hydrochloric acid, but again with variable success. Williams² reported that in addition to a reduction in acidity there is a diminution of gastric motility in pregnancy, and it has been suggested that this, together with a neuromuscular disturbance at the cardio-oesophageal junction, allows regurgitation into the oesophagus. Williams therefore advocates the use of prostigmin to stimulate gastric motility and asserts that a single injection of 0.5 mg. may relieve heartburn for several days.

In a paper on page 864 of the *Journal* this week Dr. W. A. W. Dutton and Dr. H. J. Bland draw attention to herniation of part of the stomach through the oesophageal hiatus of the diaphragm as a cause of heartburn in pregnancy. A hiatus hernia may be asymptomatic, but they diagnosed nine cases in pregnant women within three years. The chief clinical features are heartburn, epigastric discomfort, and vomiting. The last may be persistent and severe, particularly during labour, and may culminate in a haematemesis, especially if peptic ulceration of the oesophagus supervenes, while the onset of dysphagia may betoken the formation of an oesophageal stricture. Diagnostic features are that all these symptoms are aggravated by lying down and by stooping forward, and become more severe in the last months of pregnancy. It might be thought possible that the bearing-down strain of the second stage of labour might precipitate a hiatus hernia, but four of the nine women in this series were primigravid. Moreover, all reports agree not only that the symptoms abate after delivery but also that the hernia may become much smaller or even be no longer demonstrable radiographically a few months after the end of the pregnancy. Nevertheless it should be borne in mind that hiatus hernia is commoner in later life, and it may be that a long-term follow-up of cases diagnosed during pregnancy might reveal that the condition recurs when the woman is older and fatter.

¹ Strauss, M. B., and Castle, W. B., *Amer. J. med. Sci.*, 1933, 185, 539.

² Williams, N. H., *Amer. J. Obstet. Gynec.*, 1941, 42, 814.

³ Osborne, W. W., and Foster, C. D., *ibid.*, 1953, 66, 682.

Heartburn in pregnancy may therefore be of some importance, and certainly the more severe and persistent cases, especially if associated with vomiting or dysphagia, deserve radiographic investigation. Not only will a certain number of cases of hiatus hernia be discovered thereby, but there will also be brought to light the uncommon case of more extensive diaphragmatic hernia, which carries a high mortality because it is rarely diagnosed before the onset of obstruction or strangulation.³

FEEDING CHILDREN WITHOUT MILK

In the western world mothers who are either unable or unwilling to feed their babies at the breast can rely on liberal supplies of efficient substitutes made from cows' milk. After the period normally occupied by lactation, it is considered sound policy for the child to be given large quantities of milk right up to adolescence. In many Oriental and tropical countries, however, cows' milk in any form is either scarce or absent. In order to bridge the gap between the end of breast-feeding and the development of digestive powers strong enough to cope with the normal local diet, vegetable substitutes for cows' milk are urgently needed. Countless lives are being lost because in many areas no suitable alternative is available.

The value of vegetable foodstuffs is generally considered to be limited by the quality of their proteins. Although human milk is not particularly rich in total protein, its contribution of some of the amino-acids—particularly tryptophan, cystine, and valine—is difficult to equal from vegetable sources. As a general principle mixtures of vegetable proteins are better than single proteins, because their strengths and weaknesses in the individual amino-acids tend to cancel each other out. In 1944 Italian workers in Rome found that foods made from mixtures of malted cereals were useful for infant feeding at a time of acute food shortage. Improved foods of this type, with their protein contents increased by the inclusion of soya flour, were brought to the notice of Dr. Harriette Chick, who confirmed their nutritional value in experiments with rats.¹

Further trials in which cereal mixtures were given to children in German orphanages and schools have now been reported by Dr. R. F. A. Dean.² Various combinations of barley, soya, and wheat or maize, sometimes fortified with milk, were given as part of the diet to about 25 newborn babies and to over 700 children of ages up to 11 years. The results seem hopeful, although it is clear that a perfect vegetable substitute for milk has still to be devised. For infants up to 1 year old about half of the milk in the diet could be replaced by some of the mixtures. For children from 1 to 2 years old at least two mixtures seemed nearly perfect substitutes for all the milk in the diet. For children aged between 2 and 11 years almost all the mixtures gave good results, but for optimum growth a small allowance of milk was necessary.

Difficulties in interpreting the results arose from illnesses unconnected with the diet and from variations in the methods of manufacturing the cereal mixtures. Thus

soya flour contains a trypsin inhibitor, which had to be removed or destroyed by heating before the foods could be efficiently digested. Some mixtures caused diarrhoea, or were regurgitated by the younger children. Apart from the trypsin inhibitor, suspicion falls on carbohydrate rather than on protein as the component affected by the mode of manufacture. For the present, therefore, it seems that theoretical considerations of protein requirements must take second place to the rule-of-thumb methods of food manufacturers in deciding whether human babies can subsist on cereal mixtures. More intensive investigation of the chemical changes occurring during the processing of milk substitutes is urgently needed.

LIVER BIOPSY

The practice of liver biopsy as a diagnostic procedure has increased in recent years, chiefly because of the introduction of new instruments most of which function on the principle of the trocar and cannula.¹⁻⁴ In assessing the value of the procedure two aspects of it have to be borne in mind. First is the question of its dangers and complications, which have figured largely in the literature produced by both its advocates and its antagonists, while secondly the adequacy of the biopsy material obtained and the accuracy of its interpretation deserve attention.

The dangers and complications may be grouped under the headings of haemorrhage, infection somewhere along the needle track, and, more rarely, bile peritonitis. Occasional deaths have been recorded.⁵ They are most commonly due to haemorrhage caused by tearing of the capsule or by bleeding into the liver parenchyma in patients suffering from diseases causing prolonged bleeding times. For this reason a prolonged bleeding or clotting time or a prothrombin time of less than 50% of normal should be contraindications to liver biopsy. Patients should be watched carefully for 24 hours after liver biopsy, and cross-matched fresh blood should be held ready for an emergency.

The technique chosen may increase or diminish the dangers from haemorrhage. In some methods the approach is intercostal and entails fixation of the needle, its rapid introduction and withdrawal, and cessation of respiration during the manipulation. When the liver is palpable below the costal margin an abdominal approach can be used, which is clearly safer in that the needle can more freely enter the liver.

The adequacy of the biopsy material obtained largely depends on the type of needle used, and with modern instruments cores of tissue some 2-3 mm. in diameter measuring 2-3 cm. in length can be obtained. The histological examination of a piece of tissue of this size is technically easy, and after suitable fixation affords opportunities for studying liver material in a fresh state, opening up a new field of observation which has obvious advantages over post-mortem examination. As a

research tool, therefore, in spite of its possible dangers, liver biopsy is useful. But the question of its value in practical diagnosis is a different one. Where a minute fragment of a large organ is being examined, the morbid changes must be diffuse and uniform in distribution if the appearances are to be representative. Again, if the pathological process is focal or if it varies considerably from one point to another, then interpretations may be inaccurate or even confusing. Thus in cases of toxic or virus hepatitis, or diffuse hepatic fatty degeneration or fibrosis, reasonably accurate results may be expected and interesting observations may be made. In cases of malignant infiltration, abscess formation, or any other focal abnormality the diseased area may be completely overlooked. It is therefore with the former group of conditions that most reports on the methods used are concerned.^{6,7}

At present it may be said that considerably more experience is required before a final judgment can be passed on liver biopsy. It is probably best confined to teams where both clinician and pathologist are experienced in its use and where proper precautions will be taken. In those circumstances it is an informative research procedure and, as a diagnostic test, useful chiefly in those diseases which produce diffuse changes in the liver.

BULBAR POLIOMYELITIS AND TONSILLECTOMY

The now well-known association between bulbar poliomyelitis and tonsillectomy, based chiefly on American experience, has been the subject of comment before in these columns, and there is general agreement that tonsillectomy should be postponed when possible until the risk of an autumn recrudescence in the outbreak is past. Although the evidence is conflicting on whether tonsillectomy predisposes to the contraction of poliomyelitis, there seems to be no doubt that, if the disease is contracted, it is more likely to be of the bulbar type. The risk of bulbar paralysis is considered to be up to sixteen times greater in patients who have had their tonsils removed. Some new work on this subject now comes from Australia.

Southcott¹ has made a detailed analysis of the data from the 1947-8 epidemic in South Australia; 103 paralytic cases were recorded, and of these 56 had had tonsillectomy. In this outbreak 40 cases of bulbar paralysis occurred, 35 in tonsillectomized patients, 4 in non-tonsillectomized, and 1 in a patient whose history of tonsillectomy was unknown. Only one patient had had recent tonsillectomy—a 15-day interval between operation and disease. Sixteen of the 35 patients had intervals of five or more years between operation and contraction of poliomyelitis. Although the number of patients with long intervals was small, it does seem that the effect of tonsillectomy lasts at least ten years. The age distribution of the bulbar and non-bulbar paralytic cases differed considerably. No child under 5 contracted bulbar paralysis, while 11 had non-bulbar paralysis; at ages 5-14 there were 28 cases of bulbar and 19 of non-bulbar paralysis. Sixteen of the 40 cases

of bulbar paralysis and 4 of the 63 cases of non-bulbar paralysis were fatal. No evidence could be obtained from the data to show that any relationship existed between tonsillectomy and non-bulbar paralysis or non-paralytic poliomyelitis.

OSTEOCHONDritis DISSECANS

Although osteochondritis dissecans is commonly regarded as a complaint of the young adult, it usually begins during adolescence. Most of the patients are males. In two series of cases of osteochondritis of the knee¹ and elbow,² reported by Green and Banks and by Roberts and Hughes respectively, 55 out of a total of 65 patients were boys, and all the patients were under 15.

The condition consists in an avascular necrosis of an area of bone lying beneath articular cartilage. Its cause is not known with certainty. The onset during adolescence, the many patients in whom several joints are involved, and the associated epiphyseal prematurity sometimes seen suggest that an endocrine disturbance may start up the condition. Of possible local causes trauma is thought the most likely, for there is a history of injury in many cases, most of the patients are males, and when the elbow-joint is affected it is usually the right.

An attack of locking during adult life may be the first indication of osteochondritis dissecans, particularly in the elbow-joint. In its early stages the condition must often escape recognition, for the physical signs and symptoms are easily overlooked. Indeed, in many cases there are no significant physical signs. Clear radiographs, sometimes giving special views, are essential.

Green and Banks have shown that the best treatment of osteochondritis dissecans of the knee in children is conservative. In their series this consisted in immobilization in a plaster-of-Paris cylinder or in a weight-relieving calliper for four to seven months. Full weight-bearing was permitted in plaster, but the joint was fixed in a position which prevented pressure on the osteochondritic area.

Healing occurs through revascularization by creeping substitution of avascular bone, even when there is evidence of sequestrum formation. The articular cartilage, which remains healthy during the early stages, must be protected from damage, for if it becomes fissured it may separate from the underlying bone and form a loose body. In the series reported by Green and Banks 25 out of 36 joints were treated conservatively; 18 patients were followed up for one year, and in 17 the results were excellent.

We record with great regret the death at Cardiff on October 13 of Sir Ewen Maclean, emeritus professor of obstetrics and gynaecology at the Welsh National School of Medicine. He was Chairman of the Representative Body from 1910 to 1912 and President of the B.M.A. in 1928.

¹ *J. Bone Jt Surg.*, 1953, 35-A, 26.
² *Ibid.*, 1950, 32-B, 348.

¹ Chick, H., and Slack, E. B., *Lancet*, 1946, 2, 601.
² Dean, R. F. A., *Plant Proteins in Child Feeding*, Medical Research Council; Special Report Series No. 279. 1953. London: H.M.S.O.

¹ Silverman, I., *Amer. J. Surg.*, 1938, 40, 671.
² Gillman, T., and Gillman, J. S., *Afr. med. J.*, 1945, 10, 53.
³ Sherlock, S., *Lancet*, 1945, 2, 397.

⁴ Sborov, V. M., *J. Lab. clin. Med.*, 1950, 38, 773.
⁵ Davis, W. D., et al., *Amer. J. med. Sci.*, 1946, 212, 449.
⁶ Harvier, P., et al., *Presse méd.*, 1953, 61, 423.
⁷ Sborov, V. M., and Blumberg, J. M., *J. Amer. med. Ass.*, 1953, 151, 1070.

¹ Southcott, R. V., *Med. J. Aust.*, 1953, 2, 281.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

DISPATCH OF SPECIMENS

BY

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The clinical pathologist is a bridge between the laboratory and the clinician, and can function only if he is as familiar with the patient's state as with his laboratory investigations. It is possible to churn out mechanical reports on swabs from unknown sources and blood from unknown diseases, but this is technicians' work, not pathologists'. Only when the pathologist is informed of the clinical aspects of the case can he select the most appropriate means of investigating the material sent to him, and interpret his findings to suggest a diagnosis or further investigations. The minimum information sent with every specimen should be:

The patient's name, age, and sex.

The source of the material, and when it was taken.

The investigations required.

The essentials of the clinical history, including details of any chemotherapy.

The probable diagnosis.

When the case is difficult the pathologist and clinician should at least consult by telephone, and should preferably meet at the bedside.

It is easy to forget to label a specimen, and thus to destroy all certainty that the pathological report truly belongs to the patient in question. The patient's name and the date and time of taking the specimen are essential, but it is wise to add to the label some other

details, such as the patient's age or the doctor's name, in case, as not infrequently happens in busy laboratories, two patients of the same or very similar names are being investigated at the same time.

Containers

Only four types of container, some throat swabs, and glass slides are needed for the great majority of specimens for pathological examination. All can usually be borrowed from the laboratory that will perform the investigations, for it is not reasonable to expect the general practitioner to clean and sterilize his own glassware. But, if he must,

glass containers are most conveniently sterilized at home by using the ordinary domestic pressure-cooker as an autoclave: 20 or 30 minutes' cooking at full pressure is adequate.

Liquid specimens should be placed in sterile wide-mouthed screw-capped bottles (Fig. 1); corks too readily come out in transit. Three types are required:

1. Plain sterile 1-oz. (28-ml.) bottles to contain blood for serum, urine, and other fluids for culture, etc. Wash the bottles well but do not use detergents, which grossly interfere with the Wassermann reaction and some other tests. Dry thoroughly and sterilize in the pressure-cooker with the caps lightly screwed on the bottles.

2. Oxalate bottles, for most biochemical estimations on blood. Add a knife-point of sodium or potassium oxalate to a plain bottle prepared as above.

3. Wintrobe bottles for blood counts and E.S.R. (sedimentation rate) determinations. In a sterile 4-oz. (7-ml.) screw-capped bottle, prepared as above, place 0.2 ml. of a solution containing 2 g. potassium oxalate and 3 g. ammonium oxalate in 100 ml.; evaporate to dryness in a warm but not hot place. A bottle thus prepared is for 5 ml. blood.

Faeces and sputum are best sent to the laboratory in waxed cardboard containers (Fig. 2) which can be burnt after use. These containers need not be sterilized.

Throat swabs can be purchased prepared ready for use, together with suitable containers for the post (Fig. 3). They should be sterilized before use (unless obtained from a laboratory) by pressure-cooking for 30 minutes.

Glass slides can be used straight from their box. If they are washed they should be dried with a freshly laundered grease-free linen cloth. There is no advantage in storing them in spirit.

Less frequently used containers, such as bottles of broth for blood culture, fluoride tubes for blood-sugar estimations, and jars of formalin solution for histological material, will certainly be supplied by the laboratory when they are required.

The Behring venule* (Fig. 4) conveniently replaces both syringe and container. It comprises a vacuum tube to which is attached a sterile needle protected by a sealed glass covering. When this covering is removed the vacuum is preserved by a simple valvular arrangement until, when the needle is

* Obtainable from Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.

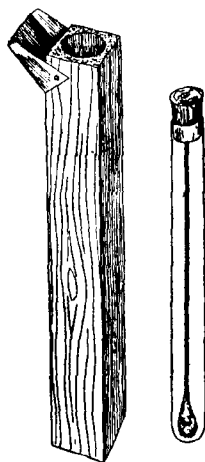


FIG. 3.—Throat swab tube, with wooden container.

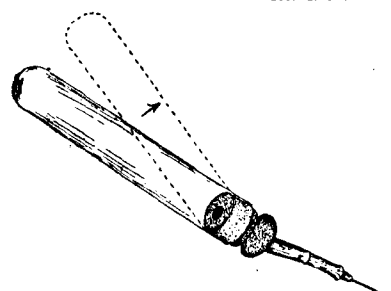


FIG. 4.—Behring venule. The dotted line shows the position when the vacuum is released.

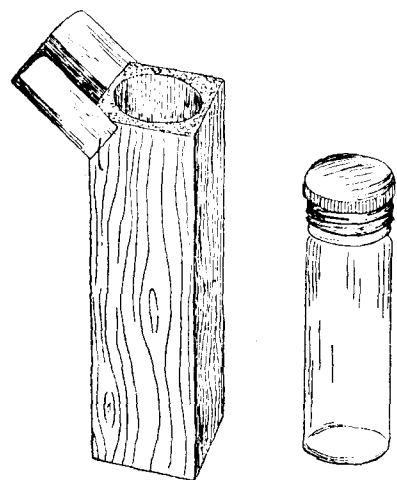


FIG. 1.—Bottle for liquid specimen, with wooden container.

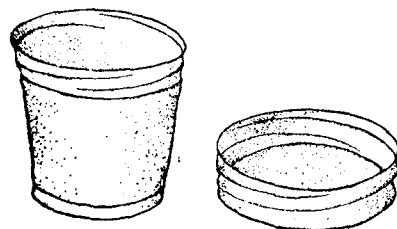


FIG. 2.—Waxed cardboard container for faeces or sputum.

in the vein, the needle is flexed on the tube. When the valve is thus opened blood is drawn into the container. Venues are prepared to correspond to the plain bottles, oxalate bottles, and Wintrobe bottles described above, as well as one containing glucose broth for blood culture. Containers suitable for postal delivery can be obtained with the venues.

Specimens for Bacteriological Examination

The proper selection of material for bacteriological examination often demands a little thought. For example, pathogens are always present in the advancing edge of a lesion, whereas they may have died out in the necrotic centre.

TABLE I.—The Viability of Common Pathogenic Organisms on Swabs, etc.

VERY RESISTANT (Survive for days or weeks)	
Staphylococci	
Streptococci	
Bact. friedländeri	
Diphtheria bacillus	
Tubercle bacillus	
Actinomyces bovis	
Anthrax bacillus	
Clostridia (tetanus, gas-gangrene, etc.)	
Viruses	
Rickettsia (typhus, etc.)	
Fungi	
E. histolytica cysts	
VERY DELICATE (Survive at most a few hours when dry)	
Meningococcus	
Gonococcus	
T. pallidum (syphilis)	
E. histolytica, vegetative forms	
Trichomonas	
INTERMEDIATE (Survive two days or more)	
Pneumococci	
Bact. coli	
Salmonellae (typhoid and food-poisoning)	
Shigellae (dysentery)	
Haemophilus (whooping-cough, H. influenzae)	
Brucella (abortus and Malta fever)	

With a few exceptions (Table I) pathogenic bacteria readily survive the normal time of transit to the laboratory. Drying and exposure to sunlight are the most deleterious factors; chilling does little or no harm. Even gonococci and Trichomonas vaginalis survive for two days or more in Stuart's transport medium, which keeps them moist while suspending their animation by lack of oxygen. A further disadvantage of delay is that saprophytic bacteria may multiply in the specimen at room temperature and come to outnumber the pathogens. The pathologist can often counteract this process by the use of selective media, but it is better to avoid it. Finally, it is necessary to remember that sulphonamides and antibiotics may suppress causative bacteria without curing the patient. If specimens are not taken before starting treatment diagnosis may be greatly delayed or even made impossible. If specific therapy has already been started, this fact should be noted.

Blood Culture.—Many bacteria are rapidly killed by the patient's undiluted blood (the typhoid-paratyphoid group are an exception). Blood for culture should therefore be diluted immediately in bottles of the appropriate medium, using about 7 ml. blood to 50 ml. medium. Ordinary broth suffices for most bacteria, but *Str. viridans* prefers glucose broth. If rarer infections are suspected (for example, meningococcal septicaemia or brucellosis) the pathologist should be asked to supply the most appropriate medium. Special media, containing p-aminobenzoic acid, are also required if the patient is receiving sulphonamide therapy.

Blood culture demands a careful but not an elaborate technique. The patient's arm need be cleaned only as for any venepuncture, and sterile towels are not needed. The most common sources of contamination are imperfect sterilization or careless handling of the syringe and needle, re-

peated attempts to enter a vein, a leaky syringe, or careless exposure of the broth while the blood is added.

Faeces.—Faeces are best carried to the laboratory in a waxed cardboard container, which can be burned. A rectal swab is as efficient as faeces for the bacteriological diagnosis of bacillary dysentery, and may save valuable time in the diagnosis of enteric fever when faeces are not available. Helminth ova are generally found in faeces, but it must be remembered that threadworm ova are deposited outside the bowel on the perianal skin. They readily adhere to a piece of "cellophane" rubbed gently over the skin; the cellophane is sent to the laboratory in a screw-capped bottle.

Pus.—A throat swab of the pus, with a smear if more than an hour or two's delay is likely, is sufficient for the diagnosis of pyogenic infections. If tuberculosis or actinomycosis is suspected, 5 or 10 ml. of the pus should be sent to the laboratory in a sterile 1-oz. (28-ml.) screw-capped bottle.

Hairs.—The infected stubs of hair in ringworm infection need to be carefully chosen. Lengths of hair broken or snipped off are quite useless, for the infection is in the hair root. It is best to send the stubs to the laboratory in a piece of white paper folded in the manner of a chemist's powder packet.

Scales.—Scales of skin may be sent to the laboratory in a paper packet like hairs (above) or may be enclosed between glass slides held together by rubber bands. The scales must be chosen from the advancing edge of the lesion, not from the centre.

Pleural Fluid (and other serous fluids such as ovarian or ascitic fluid) should be sent to the laboratory in a sterile 1-oz. (28-ml.) screw-capped bottle. A part should also be sent in an oxalate bottle for cytological examination. If malignant cells are to be looked for the fluid should be diluted with at least an equal volume of 10% formalin solution (see next page).

Sputum is best carried to the laboratory in a waxed cardboard container, which can be burned. An early-morning specimen is best, but the patient should be reminded that saliva is useless. Sputum to be examined for carcinoma cells should be sent to the laboratory as promptly as possible. Formalin or other fixatives are deleterious.

Swabs.—The ordinary throat swab is a convenient means of sending a variety of materials to the laboratory for bacteriological examination. Most bacteria survive well on the swab (see Table I), but good smears cannot be made if it has dried. A smear should therefore be made on a slide (sterilized in the flame and cooled) if more than a few hours' delay is likely. Pernasal swabs, passed through the anterior nares along the floor of the nose to the nasopharynx, are at least as efficient as post-nasal swabs, as well as being less troublesome to take.

Urine.—A mid-stream specimen of urine from the male suffices for bacteriological examination, but a catheter specimen must be obtained from females if culture is required. In doubtful cases the women need not be subjected to the discomfort of catheterization until microscopy of an ordinary specimen of urine has revealed the presence of pus. Examination for tubercle bacilli should always be made on an early-morning specimen of urine. A 24-hour specimen is often desirable if it can be carried to the laboratory. An early-morning specimen is also required for pregnancy tests.

Haematology and Serology

Blood in ordinary oxalate bottles is of little use for any haematological examination except a simple haemoglobin estimation. Blood for counts and E.S.R. determinations should be placed in Wintrobe bottles. The amount of anticoagulant used is near the minimum, so the blood and oxalate must be thoroughly mixed by repeated inversion of the bottle at intervals for two or three minutes. Even the Wintrobe oxalate mixture soon distorts leucocytes; therefore two or three blood smears should be sent with the

specimen. It is important to remember that a too-thin blood smear always gives some information whereas one that is too thick may be completely useless. A smear is generally too thick if it does not peter out before the end of the slide. Blood in Wintrobe bottles can be used for haemoglobin determinations and red-cell counts for at least two days after taking the blood, but the leucocyte count begins to fall after a few hours and may be misleadingly low after 24 hours. The sedimentation rate is also spuriously low at periods greater than three hours after taking the blood.

Blood Grouping (including the Rh factor) is best done on blood allowed to clot in a plain bottle. The specimen must arrive at the laboratory within 24 hours of withdrawal if rhesus antibodies are to be sought for.

Blood for Serological Tests.—Blood for the Wassermann reaction, Widal reaction, and other serological tests should be allowed to clot in a sterile screw-capped bottle. Contamination of the blood should be avoided. Haemolysis, whether from water or spirit in the syringe or from bacterial contamination, vitiates the W.R. and many other tests. Blood from infants for the W.R., etc., is simply obtained by pricking the well-warmed heel and allowing the blood to flow into a Wright's capsule (Fig. 5).



FIG. 5.—Wright's capsule.

Biochemical Estimations

The majority of biochemical estimations on blood can be performed with either serum or plasma from oxalated blood. Serum is generally preferred to plasma, and is essential for a few estimations (Table II). Wintrobe bottles should not be used for blood for biochemical determinations; in particular, blood from them cannot be used for urea determinations. Most biochemical determinations are valid if done within a day or two of the withdrawal of the blood; the exceptions are indicated in Table II. The blood sugar can be satisfactorily estimated after 36 hours if fluoride is used instead of oxalate.

TABLE II.—Containers for Blood for Biochemical Estimations (Minimum quantity of blood 1 ml. except where indicated)

PLAIN OR OXALATE BOTTLES	
Bilirubin (minimum 2.5 ml. blood)	
*Chlorides	
Cholesterol	
*CO ₂ -combining power (minimum 5 ml. blood)	
Non-protein nitrogen	
Phosphatase (acid or alkaline)	
*Phosphates (minimum 2.5 ml. of blood)	
Proteins (minimum 2 ml. of blood)	
*Sugar	
Urea	
Uric acid	
PLAIN BOTTLES ONLY	
Serum calcium (minimum 5 ml. of blood)	
*Serum potassium	
*Serum sodium	
Thymol turbidity	

*Estimations marked thus must be made within two hours of withdrawing the blood.

Faeces for the occult blood test should be sent to the laboratory in the same way as bacteriological specimens. Other biochemical tests on faeces, urine, etc., are rarely needed in general practice. If any should be required, the advice of the laboratory should be sought before sending the specimen.

Histological Examinations

Material for histological examination must be sent to the laboratory in a fixative solution, otherwise autolysis may make interpretation of the sections impossible. The most

generally used fluid is a 10% aqueous solution of commercial formalin. Screw-capped jars of all appropriate sizes can be obtained. Larger pieces of material should be wrapped in gauze before being placed in their container.

Postal Regulations

Every effort should be made to send pathological specimens to the laboratory by hand, thus eliminating delay and minimizing the possibility of loss or breakage. The Post Office regulations permit pathological specimens to be sent by letter post to a recognized medical laboratory or a qualified medical practitioner. Sending such specimens by parcel post is absolutely prohibited. The material must be placed in a securely closed container, which must itself be enclosed in a strong wooden or metal box in such a way that it cannot shift about, and with sufficient sawdust, cotton-wool, or other absorbent packing to prevent any possible leakage from the parcel in the event of damage to the container. The packet must be conspicuously marked "Fragile with Care" and bear the words "Pathological Specimen." Figs. 1 and 3 illustrate examples of containers and outer boxes that comply with the regulations.

Next Article on Clinical Pathology.—"Venepuncture," by Dr. I. A. B. Cathie.

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

PREVENTION OF TRANSFUSION ACCIDENTS CONSULTING PATHOLOGISTS' GROUP CONFERENCE

The Consulting Pathologists' Group Conference was held at B.M.A. House on September 30. Professor D. F. CAPPELL was voted to the chair. Dr. J. G. GREENFIELD, Chairman of the Group Committee, presented its report, which was approved.

Dr. GEORGE DISCOMBE opened a discussion on blood transfusion, its dangers, and the precautions which should be taken. The form of the problem was determined to a large extent by one's clinical colleagues. It sometimes happened that blood had to be provided in a hurry, perhaps several times in a day. Since 1946 in his department they had transfused about 14,000 bottles. Some 6,000 patients had received blood, and among those 6,000 only about 6% had developed some sort of reaction. Ten recognizable haemolytic reactions were found. In two of these no cause was discovered; eight were ABO incompatibles. He had been brought up to believe that in many cases of incompatible transfusion death ensued, but in the cases of incompatible transfusion experienced in his department there had been no deaths.

For a long time they had used capillary blood for grouping and found it satisfactory. But their technicians had been instructed to look for the slightest deviation from the normal, and if this happened they immediately sought advice and help. Mistakes were analysed, and it was found that three mistakes were due to hurry, two were due to blunders made by an inadequately trained member of the laboratory staff who gave out blood to the wrong patient, and one was due to a nurse who had not read a label on the bottle. Laboratory administration had since been tightened up so that fewer people handled the blood, and recently a unit-recording system had been introduced. Thus mistakes were obviated whereby in one case two women with the same surname, one called Margaret and the other

Peggy, were confused. If a guiding statement was needed one required a serologist, regional transfusion officers, and at least two hospital transfusion officers to put their heads together and produce an agreed document. "I believe," he said, "that the main reason why I have not spent most of my time at the coroner's court is because I have kept a very close watch on my transfusion problems, even to taking over the cross-matching and doing it all myself, and also being available to my technicians for any help I can give them."

It was comforting to be given a set of rules by which to conduct one's practice, but he did not think one could ever frame rules in such a way as to make them perfect, and if they stuck to rules rigidly "sooner or later somebody will die in consequence." The choice had to be left to the individual consultant.

Too Much Blood Ordered

Dr. J. F. HEGGIE said that many of his views had been expressed in articles in the *British Medical Journal*. The pathologist had been given the responsibility of the blood banks as regards matching, supply, and delivery to the wards, as well as collaboration with his colleagues to make sure that the number of patients placed at risk was kept to the minimum. Often blood transfusion had been prescribed by quite junior persons when it was not necessary, and in view of some accidents they had been asked to look into the matter. It was found that the situation varied enormously in different regions. Generally, however, there was a tendency to order too much blood, and so a memorandum had been formulated instructing their colleagues on the risks which they were running and the greater serological care required in cross-matching blood in people who were having to be transfused for the second or third time. They had also asked that the element of urgency be so far as possible avoided.

The hospital officers concerned were told of the substitutes that could be used immediately; also that healthy young women suffering from abortion did not in general lose as much blood as might warrant transfusion. They were also reminded that the supply of blood was limited. The methods of grouping and matching in different laboratories had been reviewed, and the advisers to the Ministry were called in and a list of what were considered to be reasonable precautions and techniques was approved. If a hospital were large enough a resident pathologist should be employed. But there were many places in his region where the hospitals were small, and in those areas it had been ensured that a senior technician or a technician suitably experienced in blood grouping and matching should be available for emergencies. All this ensured that the standard of technique was good and that it was not a matter of having a house officer engaged who had merely been shown how to group and cross-match for a week or so.

In hospital administration the rules with regard to taking blood from the bank had been made more rigid. In his own hospital it had been arranged that no nurse should be allowed to handle a bottle of blood. The blood was grouped in the laboratory by an experienced technician who was supervising the work, and a check was carried out by the senior registrar or a registrar of experience. The bottle then passed, with the name of the patient and of the donor, to a central refrigerator, from which it was taken by a member of the medical staff. By this means the number of persons handling the blood had been reduced to the minimum—the one who checked and the one who gave.

Dangers of Domestic Refrigerators

In some general discussion Dr. T. V. COOPER pointed out the danger of using the ordinary domestic refrigerator for storing blood. In fact, unless there was a recording thermometer, any type of refrigerator might let one down very badly. Dr. J. C. BRUNDRET said that in Liverpool he had a fairly complex unit. He thought that to establish a rigid national procedure would be far more trouble than it was

worth. Generally speaking, a separate technician was responsible for the checking system. Not only was the blood carefully labelled but a register went with it and signatures were required. He thought that the handling of blood could not be restricted entirely to medical people, but it should not go beyond the qualified nursing staff.

Dr. R. A. SLADDEN complained of the unduly large amount of blood which was used in many cases. Often, where two or three bottles would be adequate, eight or ten were demanded. When they were asked in an emergency to match up a bottle of blood, this could be done reasonably quickly, but if six or eight bottles were required it obviously made a great difference. Many surgeons had built up a system of using very large amounts of blood, and, as most patients responded well to treatment, the success had been credited to the massive transfusion, but no control series had been taken. He also referred to the difficulty of attending to blood transfusion demands in small hospitals in the middle of the night. There were not at present enough really skilled technicians to cover the needs of all the hospitals.

Dr. S. C. DYKE said that there was one aspect of this matter which ought to have a wider publicity. His own principle was to make it as difficult for anybody to get blood out of his bank as out of a stone, unless they had very good reason indeed. The occasions when large quantities of blood were required were relatively rare, and that was an aspect of the matter which he would like to impress upon clinicians. The ultimate giving of the blood was the clinician's responsibility, and he thought the clinician should have much more cognizance of the dangers of giving too much blood, one of which was liver damage.

A Standard Procedure

The CHAIRMAN said that there was one recurring theme in this discussion—namely, the desirability or otherwise of having a standard method of doing the whole of the cross-matching and so forth. He felt that this was a rather important matter, and, while it would never, he imagined, be true that any standard method could be followed in every case, he thought it would be helpful to have resort to such a method when necessary. A procedure might be laid down which was considered to be the ideal procedure, and any deviation from it should be a matter for very careful consideration.

Dr. HEGGIE said that in the North-eastern Metropolitan Region they had had in use for the last eighteen months a memorandum of instructions on the lines which the Chairman had suggested. They had a scheme which they had regarded as ideal, and also they had suggestions for agreed limitations and minimal degrees. He thought that if this were carefully followed they would have a perfectly valid defence in any court proceedings which might follow in a particular case. One little-known complication in blood transfusion was caused by organisms which might be present in bottles of blood but gave no sign of their presence by change of colour or by haemolysis. He knew of three fatal cases as a result of these organisms, the patients dying from massive protein shock.

Dr. C. R. LANE, Dr. J. G. A. MCSORLEY, and Dr. C. J. C. BRITTON also contributed briefly to the discussion.

Journal Article

Dr. J. M. ALSTON referred to the article under the heading "Blood Transfusion Accidents," published in the *British Medical Journal* of August 15 (p. 390). The article was published under the name of the Consulting Pathologists Group Committee, and he wanted to know how far the Group was committed by what was stated in the article.

Dr. E. E. CLAXTON (Assistant Secretary) explained that the Group was in no way responsible. The article was written by Dr. Heggie at the request of the Group Committee, but it did not mean that the Committee was responsible for what was stated in the article.

Dr. ALSTON said that he regarded the article as a very good one. He was not expressing any criticism of the article, but he did not wish it to be taken as committing the Group.

Dr. DISCOMBE, in replying on the discussion, agreed that the domestic refrigerator was a source of great trouble. One point had not been mentioned. In cold weather the refrigerator went down well below freezing-point, and he had had on occasion to put an electric radiator in his refrigerator. With regard to hepatitis, there were so many subclinical cases that he doubted whether any proper assessment could be made on how far this condition was due to previous blood transfusion. He did not think they had many extravagant demands for blood.

ADVANCES IN PATHOLOGY

The 51st General Meeting of the Association of Clinical Pathologists was held in London from October 1 to 3. Twenty-six papers were read and there were 11 demonstrations. In this report prominence has been given only to those contributions likely to interest the general reader. Not unnaturally at a meeting of this kind, most of the papers were concerned with specialist and technical problems. On the second day Professor Dorothy S. Russell delivered her presidential address on "Further Advances in Pathology."

A Relapsing Diarrhoea

Dr. A. G. SHERA (Eastbourne) described what he claimed to be a hitherto unrecognized type of relapsing diarrhoea, characterized by an explosive early-morning diarrhoea with offensive yellow stools which are often streaked with blood. It was caused by Vincent's organisms from chronic infections in the mouth and tonsils which passed the acid barrier in the stomach and settled in the rectum or sigmoid, forming characteristic "strawberry lesions." The way was prepared for the inception of these lesions by an associated vitamin-C deficiency. Diagnosis was by examination of stained faecal films or films made from swabs taken from the strawberry lesions, and by a vitamin-C saturation test. Treatment was specific, with acetarsol and ascorbic acid orally.

Colonel H. R. GILMORE (U.S.A.M.C.) described the epidemiology and clinical and pathological features of epidemic haemorrhagic fever ("Korean disease"). There was no evidence of spread from person to person or through water and food. Russian and Japanese work suggested that the causative organism is a virus or rickettsia carried by a mite, *Laelaps jettmari*, which infests the common field-mouse. In contrast, American workers preferred to incriminate a trombiculid mite, since *L. jettmari* is most prevalent in Korea, where the incidence of haemorrhagic fever is low. But they had not succeeded in passing the disease to animals or chick embryos, and the causative agent and its means of transmission were still undetermined. There were no specific laboratory tests for the disease, though albuminuria was a constant finding and 90% of cases showed increased capillary fragility. Post-mortem findings were haemorrhages into the kidneys, right auricle, anterior pituitary, and occasionally the suprarenals. Apart from these more dramatic findings, there were also submucosal petechial haemorrhages throughout the gastro-intestinal and respiratory tracts.

Dr. G. J. CUNNINGHAM (London) described two cases of malignant hypertension in which aberrant renal vessels were found at necropsy. One of these aberrant vessels had become thrombosed, and the parts of the kidney supplied by it showed mild hypertensive arteriolosclerosis, while the rest of the organ, supplied by patent vessels, contained necrotic lesions of both arterioles and glomeruli.

Dr. A. A. G. LEWIS (London) described some studies he and Mr. L. P. LEQUESNE had made on the retention of salt and water in patients after surgical operations. The usual sequence of events in such patients might be divided into three main phases. During the first 24-48 hours after opera-

tion there was diminished water excretion, owing to release of pituitary antidiuretic hormone, probably as a result of emotional disturbances caused by the operation; this phase was accentuated by anaesthesia and the giving of morphine. Sodium retention occurred on the day of operation, and was due mainly to haemodynamic factors, although increased potassium excretion was associated with it. Thirdly, a second period of sodium retention usually began on the third day after operation, often separated from the earlier phase by a period of increased sodium excretion. The magnitude of the retention during this second period might be lessened by ensuring an adequate intake of potassium.

Limitations of the Test Meal

Dr. F. AVERY JONES (London) drew attention to the limitations of the fractional test meal in the diagnosis and treatment of gastric diseases, pointing out that the widely accepted normal range of acidity is based on findings in only 80% of Bennett and Ryle's series of healthy subjects. Achlorhydria was generally regarded as implying a gastric juice with a pH greater than 3.5, at which reaction, however, there was still about 0.3 mEq HCl per litre. There was little advantage to be gained from the routine use of test meals in cases of peptic ulcer, but they might help in the diagnosis of difficult cases with symptoms referable to the upper abdomen, in which radiological reports had been negative.

Dr. P. W. DARBY (London) described the results of a battery of liver function tests in 50 patients with rheumatoid arthritis and 45 hospital patients with non-hepatic disease; 23% of the rheumatoid and only 4.5% of the control group gave abnormal results to the bromsulphalein test, and 31% of the rheumatoid compared with 5% of the controls had an abnormal urinary coproporphyrin excretion. These differences were statistically significant, and suggested that there is a higher incidence of liver damage in patients with rheumatoid arthritis than in those with other forms of chronic ill-health. Drs. J. HARKNESS and C. DONOVAN (Portsmouth) confirmed previous reports that there is an increase in total ascorbic acid of the plasma with a greater proportion of reduced ascorbic acid during four hours after an injection of A.C.T.H. Injections of cortisone had no effect on the level of total ascorbic acid but did increase the proportion of reduced ascorbic acid. These changes could be used as a test of pituitary function, since by using an unvarying stimulus to the pituitary the ascorbic acid test indicated differences in individual responses. For example, the response in some psychotics was lower than in normal controls. Changes similar to those produced by A.C.T.H. were caused by electric convulsion therapy, emotional stress, and the administration of salicylates and phenylbutazone.

NEW ACADEMIC YEAR

FACULTY OF MEDICINE, SHEFFIELD

Professor L. J. WITTS, Nuffield Professor of Clinical Medicine at Oxford, delivered the opening sessional address to the Faculty of Medicine, Sheffield University, on October 8. He took as his subject "The Opportunities of Medicine."

Professor L. J. WITTS said that he approached the task of speaking at an inaugural meeting in the spirit of Lincoln's Gettysburg address, and, rather than exhort the student, he wished to express the responsibility of the teacher, to whom so much precious human material was entrusted. There was no lack of enthusiasm for teaching on the part of the staffs of our hospitals and medical schools; the question rather was what they were to teach, and this was intimately linked with the nature and purpose of the medical profession.

The medical curriculum had not changed except by accretion since the early 1890's, when Osler and his colleagues at the Johns Hopkins Hospital started the combination of a university education in anatomy, physiology, and other sciences with an apprentice type of teaching in general

medicine and surgery. Those who asked for more training in general practice, dermatology, or psychiatry did not usually wish to disturb this general framework. More radical reformers, however, would substitute statistics, semantics, logic, psychology, and anthropology for some of the present basic sciences, and an even more revolutionary change was to reorganize the curriculum entirely, so that the basic sciences, pathology, and clinical medicine were taught simultaneously instead of in succession. In fairness it should be said that, with all its faults, the present curriculum does work. It was no good planning curricula which could be run only by completely dedicated teachers. For most teachers in medical schools, practice, research, and administration were the major preoccupations. This was right if we believed in the great didactic of Comenius, that our objective should be to seek and find a method of instruction by which teachers may teach less and learners may learn more.

The Status of Doctors

Despite the delightful pictures of Luke Fildes and Robert Louis Stevenson and the querulous letters in the medical press, there was no doubt that the medical practitioner was better off now than ever he was. The future maintenance of this status depended on our own efforts. Medicine must remain a learned profession, and it would be unwise for the universities to spend too much time on technological studies. Doctors are the most important group of biologists in the population, and in the recent war the contribution by doctors to greater efficiency in the fighting Forces and in industry was very great. This influence should be maintained in peacetime, for the great mass of the nation, including many of its leaders, was scientifically uneducated.

Medicine as a profession had three functions to perform—utilitarian, academic, and humanitarian. The humanitarian function required something corresponding to the minister's training in pastoral theology. It was doubtful if this was entirely a question of more hours devoted to the teaching of psychology and psychiatry. Patients and their relatives looked to the doctor for moral support in their hour of need, and most doctors, like their patients, still stood between two worlds, in a place where the orthodox creeds were no longer accepted but the need for a coherent philosophy remained. It was essential for the doctor to know something about religion, even if he did not believe it, and he should study the lives of great and good men, if only to carry out the Hippocratic injunction, "In purity and holiness shalt thou pass thy life." Much was learned from working with patients, for their heroism was often remarkable. Just as the doctor learned to transmit scientific knowledge, so it might be possible for him to transmit courage and serenity from his studies and his experience.

CHARING CROSS HOSPITAL MEDICAL SCHOOL

The inaugural session of Charing Cross Hospital Medical School took place at the neighbouring Royal College of Physicians on October 9. The chair was taken by Lord Inman and the address delivered by Admiral of the Fleet Sir Philip Vian.

Domiciliary Medicine for the Student

The Dean of the School, Dr. E. C. WARNER, reported a year of consolidation and progress. The level of success at examinations was high, and there were many individual distinctions. But the aim of the School, said Dr. Warner, was not so much to prepare the students for examination as to give them a grounding in the principles and practice of medicine so that they went out properly equipped for the work they had to do. To be a successful doctor something more was needed than learning: the human touch must be acquired. Arrangements had been made for students to attend domiciliary midwifery cases and also to be attached to general practitioners so as to see the family doctor's work at close quarters. One difficulty in a hospital like Charing Cross was to obtain experience in paediatrics owing to the smallness of the child population in the neighbour-

hood, but this had been met, at least in part, by association with a hospital in the East End of London. In view of building delays the intention of the hospital to move to a site outside London has so far not been realized.

Sir PHILIP VIAN gave an address in which he breezily related some experiences in the Royal Navy, both in peace and war. He said that his association with the medical profession had been chiefly with officers in the Royal Naval Medical Service, whom he had found uniformly kind, conscientious, and able men. For a short period during the war he had his own personal surgeon—a man who threw up his practice in Essex in his eagerness to serve in the Navy, and after several refusals by the authorities succeeded in persuading them to allow him to accompany Sir Philip Vian on his staff, and in that capacity took part in the Normandy landings. He also spoke of his pleasant association with Charing Cross, where his sister had until lately been on the nursing staff.

The vote of thanks was proposed by Professor W. J. Hamilton and seconded by Mr. H. G. Everard Williams.

BRITISH POSTGRADUATE MEDICAL FEDERATION

The inaugural lecture of the new session under the title "The Scientific Basis of Medicine," arranged by the British Postgraduate Medical Federation of the University of London, was delivered on October 8, in the Senate House, by Sir Henry Dale, O.M.

Need for a Broad View

The chair was taken by LORD WAVERLEY, who reminded his audience that the Federation, of which he was Chairman, embraced a number of scientific specialist institutes each providing higher instruction in a limited but clearly defined part of the general field of medicine and surgery. Since the tendency must inevitably be towards greater specialization it was becoming increasingly difficult for any student to keep abreast of the continually changing and developing basic knowledge in subjects outside his own specialty. It had therefore been decided four years ago to provide under the aegis of the Federation a series of lectures on the scientific basis of medicine. The lectures were intended for young research workers, primarily for specialists in training, and were designed to give them a knowledge of the scientific foundations of their subjects and to show something of the advance that was taking place.

Introducing Sir Henry Dale the Chairman said he was a doyen of medical science, to whom they would be happy to listen as often as he could spare the time to speak to them.

Sir HENRY DALE said he was rather diffident about giving this lecture, since it was almost identical with that which he had delivered three years ago on a similar occasion, and which had been published in full in the *British Medical Journal* (1950, 2, p. 1186) under the title "Scientific Method in Medical Research." He had, however, been persuaded by Sir Francis Fraser, Director of the Federation, who had used the argument that the audience would be almost entirely different from the one of three years ago. Referring to the programme of lectures arranged for the new session, Sir Henry Dale said, "Knowledge is advancing at such a rate in so many parts of a widening field that the supply of special topics seem likely almost to outrun rather than to fall behind the number of lectures which a session like this could manage to accomplish." Little more than thirty years ago the position was that the only hormone treatment known was by thyroid gland, and no vitamins had been identified; less than twenty years ago there were no sulphonamide drugs and no antibiotics. It was almost impossible to think oneself back to the helpless position of medicine in the face of many infections at that time. On the other hand, he was inclined to think that the triumphs of therapeutics might have claimed so much attention that too little might have been said of other remarkable changes that had been taking place. "What impresses me more and more about

the present position is that at last the whole of medical research activity, whether in the ward or in the experimental laboratories, is moving forward on a common front."

Sir FRANCIS FRASER, in proposing a vote of thanks to the lecturer, gave it as his opinion that the new series of lectures could not have been better inaugurated than in the way they had heard that evening.

Nova et Vetera

THE ROYAL CHEST HOSPITAL

One by one the little lamps are being extinguished, and it will not be long now before the Royal Chest Hospital is snuffed out. Commonly regarded as the first chest hospital in the world, it owes its existence to the enterprise of one man.

Dr. Isaac Buxton (1775-1825), of New Broad Street, was struck by the fact that, although there were separate hospitals for many diseases, and although deaths from pulmonary complaints were extremely numerous, yet there was no establishment where the treatment of pulmonary disease might have a "fair and persevering trial." His own partiality was for a moderate summer temperature of 60-65° F. in the wards all the year round, combined with skilled nursing, and he founded the hospital principally for that purpose.

Its first full name was Infirmary for Asthma, Consumption and other Pulmonary Diseases. In the course of time there were several variations on this theme, and in 1848 Queen Victoria bestowed the Royal title. Later the "Heart and Great Vessels" was also incorporated in the name, and cardiovascular disease has had its place in the hospital work ever since. In 1919 all the activities were telescoped into the title of Royal Chest Hospital. Sir Astley Cooper was interested and helped to secure the Duke of Kent as President, and in 1814 the Duke opened the Infirmary at 36, Union (now Brushfield) Street, Bishopsgate. It was a twelve-roomed house on a site now occupied by a tavern at one corner of Spitalfields market.

In 1832-3 it went first to No. 13 and then to No. 10 Artillery Street (now Lane) for fifteen years, to premises previously used as a dispensary. The house was in such a condition of insanitary squalor that for three years Dr. Ramadge, physician in charge, refused to admit in-patients, but he could not persuade the committee to improve the drains or water supply. In 1847-8 there was another move to 4, Dean (now Sun) Street, Finsbury Square, for about a year. Then in 1849 the hospital finally settled in the City Road in a house belonging to St. Bartholomew's Hospital.

Shepherds at the Angel

At that time residential terraces were springing up in the City Road, and there were already three hospitals on its south side. To the north, behind the new hospital, there were green pastures, and shepherds still guided their flocks through the two turnpikes in the road and refreshed themselves at the Angel Inn. Islington Spa and the entertainment halls in the locality were popular, but not so fashionable as they had been.

In 1862 the house was pulled down and a building more suitable for hospital use was erected. In 1876 further building was done to provide for the increasing number of out-patients, and in 1880 St. Bartholomew's sold their freehold and further extensions were made, completing the frontal appearance familiar to us with the later addition of a nurses' home and a pathological department behind.

In 1912 the tuberculosis dispensary for the boroughs of Islington, Shoreditch, and Finsbury was housed in the hospital, an arrangement which earned special praise from William Osler. In 1919 the hospital amalgamated with the Great Northern Hospital, which paid its debts and acquired a title, leaving the medical staff to continue their work independently and unimpaired until the second world war, when the whole of the front portion was destroyed by a bomb in 1941.

Pampered by Royalty

For material support in the early days the infirmary had the interest of the City Corporation, the City companies, and the City magnates, and for patronage it had the Royal Family. It was positively pampered by Royalty. Three Royal dukes in succession were presidents; Queen Victoria subscribed liberally and became a patron at a low ebb in its fortunes; other members of the Royal Family visited, and Princess Louise laid a foundation stone in 1876. Three princes of the blood presided at different festival dinners for raising funds; these were usually held at the celebrated London Tavern, Bishopsgate, where the ladies were callously relegated to a watching gallery until one day a rebel in the shape of Dr. Horace Dobell flouted the angry conservatism of the stewards and a very jolly evening ensued, with a benefit of £1,000 for the hospital.

The Early Physicians

Some of the early physicians were interesting personalities. Dr. Buxton started life as a nonconformist minister, then graduated in medicine at Göttingen. He was physician at the London Hospital for fifteen years, but there seem to have been strained relations with the governors at the time of his resignation. He succeeded in persuading several members of his philanthropic family to help the infirmary in different ways.

Dr. F. H. Ramadge followed Dr. Buxton as sole physician in 1820, and he also was possessed of a pioneer spirit. He very soon instituted a regular course of postgraduate lectures at the infirmary and started assembling a pathological museum, both of which pursuits must have been unusual at a non-teaching hospital in those days. It has been said that Ramadge was one of the first advocates of artificial pneumothorax for consumption, but the truth is just the opposite. He invented an inhaling tube for keeping the lungs well inflated, and he published many papers on the curability of consumption on those lines. He may have exaggerated the value of his instrument, but his methodical necropsy work had rightly convinced him that consumption was not so invincible a disease as most of his colleagues believed. Dr. Ramadge had disapproved of the Artillery Street house from the first, and was on very bad terms with the committee in consequence. After an exchange of offensive letters from both sides he yielded to pressure and resigned in 1847, full of resentment.

Dr. Thomas Davies was elected additional physician in 1825, and he was perhaps the most successful of the early medical staff. Having worked under Laennec for two years, he was adept at auscultation, and he did a great deal to promote the rational use of the stethoscope among practitioners in the City between the years 1825 and 1839, when he died. He also designed the first thoracic exploring needle in order to spare patients from paracentesis for purely diagnostic purposes. His postgraduate lectures were so renowned that the London Hospital invited him to repeat them and made a place for him as physician. They make good reading even now.

Dr. B. G. Babington was an early member of the committee, though not on the medical staff. In spite of this close connexion with the man who invented the glottoscope in 1829, it was not until 1866 that the hospital bought a laryngoscope, as the finished instrument was eventually named.

Subsequent physicians and surgeons maintained the reputation of the hospital, which already in 1862 was noted to be drawing patients from the home counties, the north of England, and Scotland. Among the names (other than those still alive) we find A. Leared, Herbert Davies, W. Hale-White (the first pathologist), Jonathan Hutchinson, A. Pearce Gould, Bertrand Dawson, and Symes Thompson, to whom I am indebted for some of these notes.

Teaching and Experiment

The postgraduate teaching started by Dr. Ramadge in 1822 has continued, off and on, ever since. In 1883 a medical school was included in the plan of the new building,

and in 1889 there was a public row when the medical staff were accused of using the hospital more for teaching and experimental purposes than for relief of the sick poor. One of the incidents in dispute was Moore's wiring operation for an aneurysm by Mr. Pearce Gould; another was an emergency tracheotomy performed by a house-surgeon.

Mr. Austin, the secretary of that period, was very popular with the humbler citizens of the district, who were fond of their cosy little hospital round the corner, and with his encouragement they collected one-sixth of its income, mostly in pennies. It was probably on his initiative that the board was progressive enough to admit representative "working men" as governors on a collective subscription of £10 from a group.

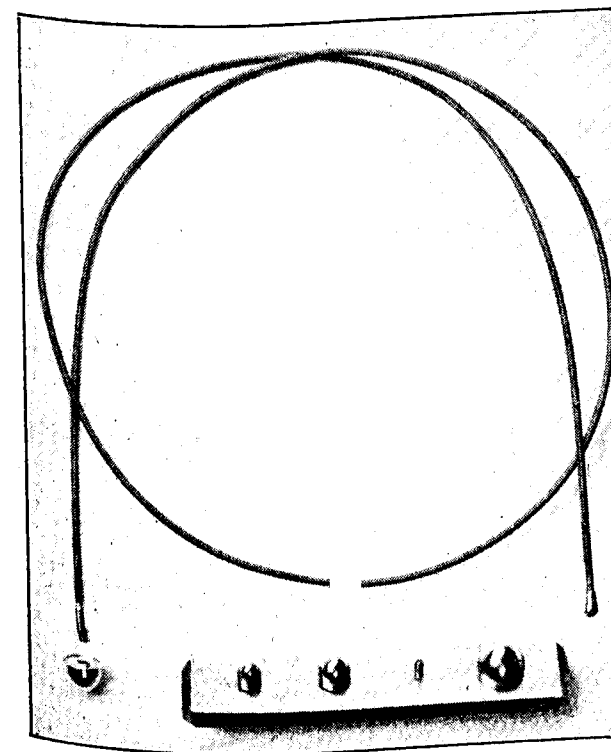
The Royal Chest Hospital has never had many beds. It started with 8 and ended with 80. There have been intervals when there were no in-patients at all, and in the last thirteen-year period after the wards were damaged and never repaired it has been possible to attend only to out-patients. The hospital has enjoyed the advantages of a compact, enthusiastic unit and suffered the disadvantages of smallness, whatever they may be. Next year nothing will be left except the scorched earth, a crowd of ill people, a few frustrated consultants, and some faithful members of the staff.

NORAH H. SCHUSTER.

Preparations and Appliances

A VEIN STRIPPER

Dr. ELIAS N. TSARDAKAS, Whittington Hospital, N.19, writes: In the modern and popular operation of vein stripping I have found the following modification of the Babcock instrument of great use. It has the following advantages: (1) The varying sizes of head allow for the wide range in the diameter of veins encountered; (2) the



great flexibility of the spiral spring stem—24 in. (60 cm.) long and silver-coated—facilitates the removal of veins, no matter in what direction they run; (3) the whole apparatus is very easily sterilized and stored, and will fit into an ordinary cigarette packet of 20; (4) it is manufactured very cheaply. The vein stripper has been made for me by Messrs. Allen and Hanburys Ltd., Wigmore Street, W.1.

Correspondence

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

Cancer and the Public

SIR.—Dr. J. F. Brailsford writes (*Journal*, October 3, p. 779): "One might think from the propaganda enthusiasts that there was a cure for cancer. . . . Whereas the truth is that we have no cure." He must know that for years it has been customary to talk about the results of treatment in terms of five-year "cures" or ten-year "cures," the word implying that the patient is apparently free of the disease over the period stated. It seems to me rather mischievous to infer, as Dr. Brailsford does, that the propagandists are misleading the public by telling them that cancer can be cured. What they do keep on telling the public is that treatment of cancer is improving and they should know about it. It is rather difficult always to avoid using the word "cure"; one is entitled to speak of the chances of being cured rather than in terms of "the percentage survival with no evidence of the disease." Few people are really interested in percentages.

Dr. Brailsford hardly serves his case by quoting Shakespeare, for the patients who had knowingly had cancer 7-10 years but failed to consult a doctor had indeed let cancer "feed on the pith of life." The poet saw the danger centuries ago, but we are still boggling at the idea that the public should be told some of the most pertinent facts about cancer.—I am, etc.,

SIDNEY RUSS.

London, W.C.1.

SIR.—The counsel of despair implied in Dr. James F. Brailsford's letter (*Journal*, October 3, p. 779) cannot be allowed to pass unchallenged, and one wonders whether it really represents his considered opinion. He must know that the fear of cancer is already present in the minds of the public just as the fear of having an abnormal baby is in the thoughts of every pregnant woman. It is to allay such fears that education may be of service.

When the figures of the British Empire Cancer Campaign's inquiry are analysed it will be seen that three-quarters of the doctors consulted did not even reply. To say, therefore, that the majority of general practitioners are opposed to lay education when only about 1 in 8 gave such an opinion is surely a false use of statistics.

Those who see many cases of cancer, however, would welcome any method of encouraging patients to seek treatment early, and if lay education can do this we would welcome it, for without holding out hopes of absolute cure quite a proportion of patients are spared considerable suffering for many years. No exaggerated claim has, in fact, ever been made for lay education; it is evident, however, that the lay mind must be educated to realize that what happened in the treatment of cancer 100 years ago should not be accepted for to-day. Or is Dr. Brailsford prepared to discredit the statistics of so many reliable centres all over the world? He surely would not advocate that patients with cancer should retire to some secluded spot and allow it unmolested "to feed on the pith of life." The reference to the curability of syphilis is somewhat inapposite, for surely neurosyphilis may be completely incurable even with the most violent treatment. Quite obviously the search for a cure for both syphilis and cancer must go on, but until then we must use every available method of treatment and suitable propaganda to combat them. Dr. Brailsford would surely subscribe to Montaigne's dictum, "To cure sometimes, to relieve often, and to comfort always.—I am, etc.,

E. D. GRASBY.

Pembury, Kent.

SIR.—To suggest, as Dr. J. F. Brailsford does (*Journal*, October 3, p. 779), that the removal of a carcinoma, without recurrence and with a patient leading a normal active life,

is no cure seems to me to be a terminological hair-splitting quibble. Two years ago I had a partial colectomy for a carcinoma of the colon. I live a perfectly normal life, and practise as a busy consultant surgeon. I am free of all symptoms. To suggest that I might as well not have consulted a surgical colleague because no cure can be held to occur merely by the removal of the affected area is, to me, just nonsense. I hope that others may benefit as I have, and nothing should be said or written to discourage them from seeking advice as early as possible. For obvious reasons I prefer to sign myself

A GRATEFUL PATIENT.

Television in Health Education

SIR,—The report of the General Practice Review Committee (*Supplement*, September 26, p. 103) includes some strong adverse criticism on the use of television in health education. The fact is that television is an extremely potent but delicate weapon for health education, and must be handled with great skill or its effect on the public will be deplorable.

If, as the report stresses, the use of this medium has not always been happy, it seems ungrateful not to mention at the same time how valuable a contribution television can make when expertly used, as in the three brilliant documentaries written by Dr. Cormac Swan—"Dangerous Drugs," "Family Doctor," and "Under Her Skilled Hand"—each of which perfectly fused instruction and entertainment and did the job they were designed to do.

I should be sorry to see a medium potentially so powerful in this field condemned and cast aside through a failure to learn from these documentary models.—I am, etc.,

London, S.W.1.

GUY WIGLEY.

Orthopaedic Care in Poliomyelitis

SIR,—Like Sir Reginald Watson-Jones (*Journal*, October 10, p. 828), I am glad that physicians, laryngologists, and anaesthetists are making so determined an effort to save the lives of patients severely stricken with poliomyelitis. At the same time I share his disquiet at the apparent tendency to equate the early care of the patient in danger of his life with the whole treatment of the disease. I, too, have seen the Welsh Regional Hospital Board's circular, and it is a disturbing document. Undoubtedly we must be prepared for a catastrophe such as has stricken Copenhagen—and it happens that part of the work on the design of the British cuirass respirator is being undertaken here by my colleagues Dr. Kinnier-Wilson and Dr. J. C. Scales. But I am beginning to wonder whether, in anticipating an epidemic of a kind that has occurred only twice in the history of poliomyelitis, there is a danger of neglecting to strengthen our resources for dealing with the disease as we find it in Great Britain and as it has occurred this year. In Coventry, for example, there has been only one death and only four patients requiring respirators. Even in Copenhagen the ordinary manifestations of poliomyelitis, paralysis of the limbs and trunk, and the ever-present tendency to contracture and deformity, were and still are important.

May I try to illustrate what I mean by reference to but one aspect of the early treatment of poliomyelitis—namely, the prevention of deformity? This word does not appear in the Welsh Board's document, yet the title is "Poliomyelitis" without qualification. Nevertheless, the prevention of contractures and deformity is of immense interest to those primarily concerned with their prevention and treatment—namely, orthopaedic surgeons. It was W. J. Little, a physician on the staff of the London Hospital, who, in 1838, founded the first orthopaedic hospital in London. He was well informed about the mechanisms of deformity, and wrote a remarkable book on those affecting the foot. There was a good reason for this; he himself had a deformity of the foot that was almost certainly caused by poliomyelitis. But I have not yet met a twentieth-century W. J. Little. Those interested mainly in the acute disease see before them a

patient who has paralysis and who is perhaps gasping for breath and unable to swallow; at this stage his joints are not stiff and his body is not misshapen. They are but dimly aware of what lies ahead; they have not seen the grotesque deformities that can occur; they do not appreciate the significance of, say, a little stiffness in the joints of the fingers.

Twenty years ago I saw many operations performed on bones, joints, and tendons for correction of paralytic deformity. Most of these operations are now obsolete. It was increasingly recognized that deformity can easily be prevented if what for the sake of brevity may be called orthopaedic treatment is started before contractures can develop—that is to say, in the first weeks of the disease. Furthermore, if late deformity was to be avoided, supervision of the patient was necessary over a period of years. Gradually a vast apparatus for dealing with crippling conditions, of which poliomyelitis is now one of the most important, was built up: the orthopaedic establishment (there are no fewer than 43 special hospitals) with its physiotherapy department and pool, plaster room and splint shop, hospital school, rehabilitation scheme, and follow-up clinics. Are we to understand from our brethren in Wales that all this is now of no consequence, or perhaps something taken for granted like the supply of electricity or water? If the orthopaedic surgeon and what he represents are excluded—as was done in Cardiff—a most vital element is missing.

In the report of the meeting mention was made of additional facilities, and no doubt they are needed. But, whatever form an epidemic may take, the place where additional facilities are most urgently required is the orthopaedic hospital. At the present time most orthopaedic surgeons are handicapped by long waiting-lists and by inadequate assistance. Yet theirs is the ultimate responsibility. The patient will come to the orthopaedic department or hospital at last, however many sorts of people may have dealt with him on his way there. I once visited a capital city of northern Europe where the role of the orthopaedic surgeon was to take charge of the victims of poliomyelitis at a time dictated by the physician who treated them in the early stages. I found the surgeon I met there was far busier with his cases of poliomyelitis than we are accustomed to be. He was expert in the sort of corrective procedures that most of us here had hoped never to practise again. Are we in Great Britain to go the same way? Already there are a few signs of it. They are there to be seen in the wards of our country hospital at Stanmore. We estimate that inefficient treatment in the early stages lengthens the patient's stay in hospital by one-third to one-half.

This interest in bulbar paralysis is welcome, yet although there is the potential threat in every case, the plain fact is that most patients with poliomyelitis escape it. It is becoming difficult now to hear the still small voice of common sense above the whirring of pumps and the whistling of tracheotomy tubes. Would it not be better to make a concerted effort to provide better treatment for every aspect of poliomyelitis, each member of the team contributing his own special skill for the benefit of those who have fallen victims to this dreadful disease?—I am, etc.,

London, W.1.

H. J. SEDDON.

SIR,—It is regretted that the British Orthopaedic Association should have gained the impression, as suggested in Sir Reginald Watson-Jones's letter (*Journal*, October 10, p. 828), that orthopaedic surgeons are in any way excluded from their rightful place in the treatment of poliomyelitis in Wales. It is only fair to point out that the special committee of consultants which met some time ago were dealing essentially with one aspect of poliomyelitis, that of the respiratory complications.

The recommendations in the memorandum to which Sir Reginald refers are additional to the already existing arrangements, which are described and which make special mention of the necessity for orthopaedic supervision.—I am, etc.,

Cardiff.

A. TREVOR JONES,
Senior Administrative Medical Officer,
Welsh Regional Hospital Board.

Succinylcholine Chloride for Casualty Anaesthesia

SIR,—We should like to suggest the following technique as a simple and effective method of obtaining adequate relaxation during manipulations in the casualty department.

A syringe, containing 100 mg. of succinylcholine chloride ("scoline") and fitted with a small-bore needle, is introduced into a vein on the dorsum of the hand and strapped in position. The hand is then placed across the patient's chest, where it can easily be reached by the anaesthetist while he is still holding the face mask in position. Light anaesthesia is obtained with nitrous oxide and oxygen from a Boyle's apparatus. As soon as consciousness is lost, 25 mg. (for an average healthy adult) of succinylcholine chloride is injected, and approximately 15 seconds later the surgeon commences reduction. This dosage gives excellent relaxation without causing complete apnoea. By the time the plaster has been applied, completely normal respiration is re-established and the anaesthetic is discontinued. The patient is now able to walk out of the theatre and may safely go home. Should momentary apnoea occur, this is readily dealt with by gentle compression of the rebreathing bag. If a check x ray is required, the patient is maintained on gas and oxygen while films are taken and developed. Should further correction prove necessary, the dose of succinylcholine chloride may be repeated.

We have used this method with success in small children, reducing the dosage of succinylcholine chloride according to the patient's size.

This method is particularly valuable in a busy casualty department where the shortage of nurses and recovery rooms renders it necessary to send the patient home as soon as possible.—We are, etc.,

TERENCE VAZ.

J. M. BISHOP.

Slough.

Bornholm Disease and Poliomyelitis

SIR,—Dr. Gilbert Dalldorf (*Journal*, August 1, p. 287) asks whether poliomyelitis and Bornholm disease ever occur simultaneously. As Bornholm disease is not notifiable, evidence on this point is probably scanty, so the following may be of interest.

Since the beginning of 1952 a group of 10 general practitioners, strategically selected to cover the city of Auckland, have been reporting to me every week details of non-notifiable infectious diseases seen in their practices. Their figures represent about one-fifteenth of the cases attended by doctors in the population of 302,560 within 10 miles of the centre of the city. The table below shows the actual numbers of cases of Bornholm disease seen by this group, as compared with the number of poliomyelitis cases occurring in the same area.

Month	B'holm	Polio.	Month	B'holm	Polio.	Month	B'holm	Polio.
1952			1952			1953		
Jan. . .	9	0	Jan. . .	3	41	Jan. . .	8	9
Feb. . .	22	4	Feb. . .	1	49	Feb. . .	0	7
Mar. . .	18	5	Mar. . .	2	69	Mar. . .	2	4
Apr. . .	4	5	Apr. . .	0	45	Apr. . .	1	7
May. . .	4	0	May. . .	2	38	May. . .	6	0
June. . .	1	2	June. . .	0	17	June. . .	5	0
July . .	2	20	July . .	0	17	July . .	2	2

It will be noted that Bornholm disease waned as the poliomyelitis epidemic developed, and has shown a tendency to recrudescence as the epidemic subsided. The last case of poliomyelitis previous to February, 1952, occurred in April, 1951. The poliomyelitis incidence in the city on the present occasion reached 107 per 100,000.—I am, etc.,

Auckland, New Zealand.

A. W. S. THOMPSON,
Medical Officer of Health.

Poliomyelitis Vaccine

SIR,—The international committee on poliomyelitis, which recently met in Rome, has focused attention on the need for an effective vaccine against this disease. If it were ever to be shown that poliomyelitis and any other disease con-

sistently occurred in different areas, or were in any way mutually exclusive, such a discovery would intensify the hope that we might eventually find a virus which stands in relationship to poliomyelitis as does vaccinia to variola. This would indeed be one of Nature's kindest gifts.

Every summer and autumn, nowadays, we are called to see a higher proportion of the fevered in our practices than used to be the case. Behind each such call is the fearful hope that "it is nothing really serious." Dr. A. P. Grimby (*Journal*, September 12, p. 628) has recently stressed the importance of realizing that many of these cases may in fact be non-paralytic poliomyelitis, even in the absence of an epidemic of paralytic cases. Dr. Gilbert Dalldorf (*Journal*, August 1, p. 287) has asked for reports of any evidence that Bornholm disease and poliomyelitis do not commonly occur in the same district at the same time. Of equal importance would be reports from areas, consistently free from poliomyelitis, about the nature and epidemiology of any outbreaks of pyrexia of unknown origin and transient duration which occur about the same season as poliomyelitis. For from such information a clue might come to show that non-paralytic poliomyelitis and paralytic poliomyelitis, though antigenetically similar, were sometimes separable. This could happen if a viscerotropic variant of poliomyelitis virus exists and was ever distributed in epidemics under natural conditions.

Its existence could only be recognized in an area where it had succeeded, by prior immunization, in "blocking" the spread of the normal neurotropic virus. I believe that if an intensive survey could be carried out of the unknown pyrexias of summer and autumn, particularly in relation to those villages or groups of villages and small towns where paralytic poliomyelitis has not appeared since the war, we might find a natural viscerotropic virus which could better serve our purpose as a starting point for a vaccine than would normal neurotropic virus derived from paralytic cases.

Dr. R. Wigglesworth (*Journal*, August 29, p. 507) calls for an intensification of research into the ecology of a number of virus diseases, including poliomyelitis. In collecting information of this sort the College of General Practitioners might play a most valuable part.—I am, etc.,

Peaslake, Surrey.

G. I. WATSON.

Cortisone and A.C.T.H.

SIR,—A widely read report on cortisone and A.C.T.H., based on two articles published in the "Annual Advances in Treatment" number of your contemporary *The Practitioner*,^{1,2} appeared recently in *The Times* (October 2). We feel that these articles express inadequately the true status of these drugs in the modern treatment of rheumatoid arthritis. The authors state correctly that cortisone can have a profound and gratifying effect in suppressing the symptoms of rheumatoid arthritis. They go on to say, however, that after early hopes and optimism disappointment inevitably follows. After more than three years of experience, during which time we have returned many previously incapacitated patients to an active life on relatively small doses, we feel that this second statement is no longer true.

Both articles state that prolonged treatment may bring with it a host of difficult and even dangerous side-effects, mentioning addiction, fluid retention, cardiac embarrassment, and mental change—as well as others which we find more hypothetical than real, such as spontaneous fracture. The art of medicine would seem to us to be concerned with obtaining the effects desired while avoiding unwanted sequelae, and prolonged and unskilful treatment with many other drugs might also justify these statements. We agree that cortisone is a more difficult drug to use properly than was at first hoped, and this has discouraged many on both sides of the Atlantic who like fool-proof weapons. We have found it possible to achieve success, however, in a majority of cases if enough time and trouble are taken.

The authors also decry treatment with these substances on the grounds that quiescent infections, such as tuberculosis, may be masked, hypertension made worse, or a rebound of the disease occur on stopping treatment. All these possibilities should be well known to anyone using cortisone or A.C.T.H. Such infec-

tions must be excluded before cortisone or A.C.T.H. treatment is considered, and, if found, are absolute contraindications to their use. Treatment never should be stopped abruptly, but tailed off very gradually.

Readers are also advised against using these substances in rheumatoid arthritis, as "there is some evidence that in the long run the ultimate state of patients controlled by cortisone is no better than those controlled by adequate doses of aspirin." This amounts to saying that both drugs suppress but do not cure the disease. In those cases where such suppression can be adequately produced by aspirin we would agree that this should always be our drug of choice. It is only in cases where simpler drugs fail that cortisone is indicated. The authors conclude that "before using cortisone it is necessary to balance carefully the beneficial effects . . . against the risks which its use involves." Such advice is surely applicable when we consider the use of any powerful therapeutic substance. They also both suggest that "the early beneficial effects may need progressively larger doses for its maintenance." This statement is entirely contrary to our observed experience.

We believe that the modern status of cortisone and A.C.T.H. in the treatment of rheumatoid arthritis would be more accurately stated as follows. These drugs constitute the only short-term therapeutic weapons we possess with which we can, in many cases, completely suppress the signs and symptoms of this disease. They are not applicable to all cases—indeed, candidates for such treatment must be carefully selected, as there are many known contraindications. These substances are by no means fool-proof, and considerable experience in their use is required if good results are to be maintained. Patients on such treatment must be constantly reviewed, as their therapeutic needs and responses may vary rapidly. Such treatment should be used together with the other basic forms of treatment designed to prevent deformity, etc., and never as the sole therapeutic method.—We are, etc.,

W. S. C. COPEMAN,
O. SAVAGE.

London, W.6.

REFERENCES

- ¹ Dunlop, D. M. (1953). *Practitioner*, 171, 343.
² Tegner, W. (1953). *Ibid.*, 171, 424.

Danger of Penicillin Injection

SIR,—The reports of severe anaphylaxis following injections of penicillin are extremely interesting, and this condition is undoubtedly becoming more common (*Journal*, October 3, p. 770 and 777). I have seen one severe reaction in a nurse, following an injection of 200,000 units procaine penicillin.

Sulphonamides could be used in very many cases where penicillin and other antibiotics are now given. There is no doubt whatever that if sulphonamides had been discovered after the antibiotics they would have been regarded as a tremendous advance. Surely we should use sulphonamides much more frequently than we do, for they cause less inconvenience to the patient and the nursing staff, and are likely to give rise to less severe toxic reactions.—I am, etc.,

London, N.W.10.

HORACE JOULES.

Spectacles

SIR,—The recent letters by Drs. R. U. Gillan and Christopher Heath (*Journal*, September 5, p. 568) concerning the probable or possible connexion between migraine and errors of refraction remind me of a wise saying by my late revered chief, Dr. Samuel Gee, which may be not without interest to your readers. Dr. Gee was a lifelong sufferer from severe and quite erratic attacks of migraine. He frequently consulted ophthalmological colleagues and they invariably prescribed spectacles. I have often heard him say that while he wore no glasses he never knew at what moment he might be prostrated by an attack. "When, however," he would add in that curious hesitant method of speech which it is quite impossible to reproduce in print, "I wore the spectacles which they ordered for me I was quite certain that I should be laid up by an attack within half an hour." It was Dr. Gee's invariable custom during a

great many years to commence his rounds at St. Bartholomew's at 1.30 p.m. every Tuesday, Thursday, and Saturday. It is a curious and perhaps not uninteresting fact that during this long period he was never once prevented by an attack of migraine from carrying out this invariable routine.—I am, etc.,

Esher.

C. F. HADFIELD.

Myxoedema Coma

SIR,—Dr. V. K. Summers in his interesting article (*Journal*, August 15, p. 366) states: "Once coma develops (in myxoedema) it seems to be irreversible." The following two cases show that this is not always so and that recovery may be spontaneous.

A 63-year-old housewife was admitted in December, 1951, having lost consciousness a few hours before. She was grossly myxoedematous and was in coma, though responsive to stimuli. There was nothing else to account for the coma. The patient spontaneously recovered full consciousness within 24 hours of admission without specific treatment. A typical history of myxoedema was then obtained extending over two years. For six months she had been increasingly lethargic, drowsy, and sensitive to cold. The radioiodine excretion pattern was hypothyroid in type and did not alter materially after a course of thyroid-stimulating hormone. Her ketosteroid excretion in 24 hours was 5.1 mg., kepler factor A was 143. The patient remained fully conscious while these investigations were being done. She steadily improved with L-thyroxine therapy and was euthyroid three months after starting treatment.

The second case was a woman of 69 who was seen at her home in 1949. She was immensely fat, obviously in an advanced stage of myxoedema, and stuporose. Her trunk felt almost as cold as the surrounding January air. She had been vomiting for a few days and the blood pressure was 90/70–85/60. In spite of immediate admission to the hospital and prompt oral treatment with thyroid extract, stupor deepened to coma and she died five days later without recovering consciousness. Necropsy revealed almost complete atrophy of the thyroid. The pituitary was normal. There were large medullary haemorrhages in both suprarrenals, but apart from recent compression the cortices were normal. The patient's history was obtained in detail from her daughter with whom she lived. She had clearly suffered from myxoedema for some years. The point of interest was that two years before her terminal illness the patient had been in coma at home for several days and had made a spontaneous recovery. It seems reasonable to suppose that on that occasion the coma was due to the myxoedema. In her last stages the vomiting and hypotension were probably due to the unusual occurrence of suprarenal haemorrhages which must have hastened the end.—We are, etc.,

Cardiff.
Isleworth.

L. BROTMACHER.
N. F. COGHILL.

Appendix in the Hernial Sac

SIR,—Mr. T. E. Winckworth's letter (*Journal*, September 5, p. 567) records a case of acute perforative appendicitis in a hernial sac in a man of 62, and inquires as to the frequency of this condition. It may be of interest, therefore, to report its occurrence at the earlier extreme of life. In March, 1951, there was admitted to hospital a baby of 7 weeks, with a tender irreducible swelling occupying the right inguinal canal. An occasional lump had been previously noted in this place by the nurse. The child had vomited once about 48 hours before, and after a normal motion had been constipated for this period. The temperature was 102° F. (38.9° C.), pulse 120, abdomen soft, both testicles normal in size and situation.

At operation on a diagnosis of 'strangulated inguinal hernia, a foetal type appendix perforated at its middle was found in a sac full of pus, the neck of the sac being shut off by the caecum. The appendix was removed, the stump being easily invaginated. The neck of the sac was closed,

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nd the canal was drained. The child was discharged ealed on the tenth day, and has remained well since, having ashed through an attack of pertussis without any sign of eherniation.—I am, etc.,

H. B. WALKER.

Minehead.

SIR,—I was very interested in the case described by Dr. E. Winckworth (*Journal*, September 5, p. 567), because have on two occasions seen a similar condition associated with femoral hernia.

Two years ago, while I was working with the late Mr. N. E. Tanner, he operated on a woman for a femoral hernia which had recently become tender. At operation the sac was found to contain the tip of the appendix, which was considerably swollen and congested. There were early signs of inflammation, but the congestion was considered to be secondary to the impaction of the appendix in the neck of the sac. Curiously, exactly one week later, I personally operated on an identical case in a woman. I have not, however, heard of any similar cases.

With regard to the occurrence of the normal appendix in a hernial sac, I recently found one in the sac of an inguinal hernia in a small child.—I am, etc.,

Birmingham.

D. G. MAURICE.

Possible Sequel of Treating Infants in the Erect Posture

SIR,—I was interested to read Professor John Craig's reference (*Journal*, July 11, p. 98) to flattening of the head noticed in infants nursed in an upright posture. At this hospital a similar condition has been present in three cases of cardiochylasia or hiatus hernia nursed in a "chair." In one child the flattening was marked during the period of treatment, but at the age of 2½ years the shape and measurements of his head seem to have reverted to normal. He has not required any form of therapy since he was a year old.—I am, etc.,

Pontypridd.

W. DAVIES.

Pain of Transurethral Manipulations

SIR,—As a urologist, I heartily agree with your two correspondents, Dr. E. C. Atkinson (*Journal*, August 22, p. 440) and Mr. H. Calvert Dales (*Journal*, September 5, p. 567). May I put in a plea for the use of smaller instruments as well as lignocaine ("xylocaine") and/or general anaesthesia?

In my clinic I use a 16 French viewing cystoscope, which I had specially made. This is only three-quarters the size of the 21 French cystoscope generally used. For double catheterizing I use either an 18 or 21 French American Brown Bueger instead of the 23 French double catheterizing cystoscope in general use, some of which in practice tend to be even larger than the listed scale. For anyone who is accustomed to endoscopy these smaller instruments give an adequate view, and I am sure contribute considerably to the comfort of the patient, both during the procedure and afterwards.—I am, etc.,

Luton.

HENRY CLARKE.

SIR,—I am glad that Dr. E. C. Atkinson (*Journal*, August 22, p. 440) has raised the question of anaesthesia for transurethral instrumentation. It is a matter of astonishment to me that even now some surgeons pass instruments per urethram without any anaesthetic at all. I think that there is a tendency to decry local surface analgesics as useless because they are never given a chance. I have seen surgeons use a local analgesic, and immediately start to operate. Mr. Lang Stevenson waits for ten minutes, and Mr. Winsbury-White for five minutes (*Journal*, September 19, p. 674). I am sure it would surprise many readers to know how long five minutes' waiting means. If checked by a watch it is very much longer than one thinks.

For many years I have followed the advice of my colleague, the late Mr. Douglas Crow, who was in charge of the throat department at the Royal Sussex County Hospital. He used to teach that after anaesthetizing a patient with a

local analgesic one should treat another patient, and after that return to the patient one has anaesthetized—by then the analgesic will have taken effect. I am sure that, if adequate time were allowed, local analgesics would be more effective, and Mr. Crow's simple method ensures this.

No surface analgesic will anaesthetize the deep structures, and gentleness is still necessary. I have had patients attending my out-patient clinic for years for dilatation of a stricture under a local analgesic, who have occasionally had to submit to this treatment without an analgesic when I have been away, and they tell me the local analgesic makes a very great difference. I follow the technique of the late Canny Ryall, but, having had a few alarms with cocaine, for many years now I have used 1/1,000 cinchocaine ("nupercaine") with good effect and no untoward results.—I am, etc.,

Hove.

H. J. MCCURRICH.

Neonatal Asphyxia

SIR,—Your annotation (*Journal*, August 8, p. 328) and the correspondence on this subject have prompted me to quote an article describing a resuscitation trolley that was photographed and produced in the *Journal of Obstetrics and Gynaecology of the British Empire* (1949, 56, 1044).

This referred to a resuscitation trolley the purpose of which was to facilitate the passage of an endotracheal tube so that a newborn baby might be insufflated with oxygen and respirations established. Since this time in the last 3½ years this trolley has been present at every caesarean section (215) and forceps delivery, and a large percentage of the babies have required this method of resuscitation consisting purely of the rhythmic insufflation of the lungs through an endotracheal tube with oxygen controlled at the correct pressure with a water manometer. No other method of resuscitation has been used, and no drugs of any kind have been administered to a baby to stimulate respiration.

With the use of a resuscitation trolley as described it soon becomes practicable for an anaesthetist or obstetrician to pass an endotracheal tube in any sized baby, and with the use of a water manometer no injury to the baby will occur by too great a pressure of oxygen being applied to the baby's lungs.—I am, etc.,

Workington, Cumberland.

JAMES B. JOYCE.

SIR,—I am grateful to Mr. W. G. Mills (*Journal*, September 19, p. 675) for writing that my "arguments are sound" and that my "practice can be shown to give dramatic results" but I cannot claim by anyone who takes the trouble to try, but I cannot claim the special skill with which he credits me in giving intracardiac injections. They are, in fact, simplicity itself in infants.

All that is required is a hypodermic syringe with a 1-in. (2.5-cm.) needle of fairly fine bore—a No. 15 or 16 is suitable. This is inserted about 3–4 cm. internal to and superior to the position of the normal apex beat, and slight suction is applied from time to time as it is inserted the last half of its length. Immediately blood appears in the syringe the desired dose of "cardiazol" ephedrine is injected. If by any chance the ventricular cavity is not struck the first time it is only a matter of seconds to have another try. The fine needle cannot possibly do any damage, though it is possible that it and the injection of 0.5 ml. of fluid into the cavity might stimulate a contraction in a heart which had practically ceased to beat.

The great advantage of the method is that it is certain. The dosage does not depend on or get lost in the peripheral circulation before it reaches the heart, and, if by any chance the result is not, as Mr. Mills says, "dramatic" owing to the heart having ceased to beat, I have in one case found that firm alternating pressure on the thorax apparently initiated enough circulation to take the blood to the brain and make the baby breathe. In such cases milking the umbilical cord would have been useless, and of course all oxygenating methods—such as that mentioned by Dr. David Morris (p. 675)—depend on the existence of quite a reasonable peripheral circulation. I am glad to see that quite a few textbooks now suggest intracardiac injections. The great

difficulty is to get people to use a drug, cardiazol ephe-drine, which no textbook mentions but which is much more effective and logical than nikethamide ("coramine"), and still more so than lobeline, which is practically useless in these cases.

May I take this opportunity to correct and apologize for a slip in my previous letter (*Journal*, August 29, p. 510)? I there wrote that you noted (*Journal*, July 25, p. 199) that, while the maternal mortality has been quartered in the last 20 years, the stillbirth rate remains unchanged. What you actually wrote was: "While in the last 20 years the maternal mortality has been quartered, stillbirths and neonatal deaths have shown no comparable decline." The difference is significant, though not sufficiently so to affect the argument or need correction except in a scientific journal. I am sorry it happened.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

Some Complications of Temporal Arteritis

SIR,—Dr. David Kendall's article entitled "Some Complications of Temporal Arteritis" (*Journal*, August 22, p. 418) comments on the occurrence of this disease in arthritic patients.

A woman of 78 years in good health, and who had not previously suffered from arthritis, experienced sudden acute pain in the right hip-joint. The onset of the pain could be timed to within a few minutes, occurring on rising from her chair after lunch. The pain was of such intensity as to suggest a fracture of the neck of the femur. The leg could not be raised from the bed for several weeks. This attack was shortly followed by a similar acute pain in the left hip-joint, and two months later by temporal arteritis affecting both temporal arteries and the occipital branch of the right occipital artery. As the arteritis resolved, the patient rapidly became blind in the right eye, and has only a little vision in the left eye.

I would like to suggest that the lesion in the region of the hip-joints was possibly of the same nature as the inflammatory condition of the other arteries with the same type of onset and resolution.—I am, etc.,

Newport, Mon.

K. V. CROWTHER.

The Age of the Menarche

SIR,—Referring to Drs. Dagmar C. Wilson and Ian Sutherland's memorandum (*Journal*, September 12, p. 607), Stefansson¹ mentions that the girls in the Arctic begin with their menstrual period at an early age, but he points out that they protect themselves against the cold so efficiently that their bodies are as warm as if they were in the Tropics. This is further evidence that climate is not the determining factor, and suggests that clothing must be taken into consideration.—I am, etc.,

Wilshire, Lancs.

ARTHUR H. GREGSON.

REFERENCE

¹ *The Friendly Arctic*, 1921, London.

Emergency Bed Service

SIR,—Dr. Stephen J. Hadfield reports, in his field survey of general practice (*Journal*, September 26, p. 683), that the Emergency Bed Service has attracted a certain amount of adverse criticism. This is perhaps inevitable, but he adds: "There seems a lot to be said for the principle that if a general practitioner has decided that admission to hospital is urgently necessary then the job of the Emergency Bed Service should be to find a bed and not first to decide whether or not a bed should be found."

The Service is only too well aware of the resentment felt by many practitioners at being asked clinical details by lay staff. It fully recognizes that its job is to find a bed and not to "decide whether or not a bed should be found"—a decision which, as a lay organization, it does not and cannot make. With nothing but a bare diagnosis, however, finding a bed is always a difficult and hopeless task. Deplorable though it may seem to general practitioners, the fact remains that the majority

of London hospitals are unwilling to accept a case from the E.B.S. without clinical details. The information requested from the practitioner, which varies with the diagnosis, is that which experience has shown is most often required by the hospitals, and which the doctor himself presumably gives if he applies direct to the hospital.

A further reason for requiring clinical details is that, on occasions when difficulty is experienced in finding a bed, the case is submitted to a doctor representing the regional boards. This doctor cannot assess the case and give instructions to the Service without adequate information.—I am, etc.,

G. F. ABERCROMBIE,
Chairman, Emergency Bed Service Committee,
King Edward's Hospital Fund for London.
London, E.C.2.

The Method of Execution

SIR,—I am amazed at the complacency of chaplains and others not about to be hanged regarding our present method of execution. It is defended because only 9 to 12 seconds are said to elapse between the procession from the condemned cell and the pulling of the scaffold lever, as against the minute which would elapse before unconsciousness supervened upon the first inhalation of carbon monoxide gas.

It is a well-known fact that the first effect of carbon monoxide poisoning is a blunting of the emotions, while in any case there would be no need for a staged execution, and the fatal gas, being odourless, could be introduced without pomp and circumstance, after the expiration of the customary period for grace.

In contrast, let any person of imagination picture himself taking the horrid drop with its awful culmination, after the expiration of those few seconds. Would anyone, Sir, not prefer for himself almost any other method?

As a doctor, I would not hesitate to administer euthanasia to any unfortunate so condemned to execution, and I would be infinitely grateful to anyone who would administer to me any hypodermic or intravenous injection to save me from the horror of our present barbarous method.—I am, etc.,

South Molton, N. Devon.

R. A. NASH.

SIR,—May I most emphatically dissociate myself from the activities of the B.M.A. representatives who have been discussing improved methods of killing persons convicted of murder?

May I point out that our activities should only be concerned with life and its preservation and that the B.M.A. has no place in discussions on taking life?

Finally, may I please be permitted to suggest that, if as an Association we are consulted, we should in all humility recognize that there are no circumstances which absolve us individually or collectively from the ancient Commandment "Thou shalt not kill"?—I am, etc.,

Gateshead, 8.

K. T. BROWN.

St. Luke's Day

SIR,—The small international society of which Luke, the physician, was a foundation member is now world-wide. On October 18 its many thousands of members recall with gratitude his life and work. How much poorer the world would be had Luke never lived and laboured. We of the medical profession may well take our part in commemorating with gratitude his life and work, and join in the hope and prayer that by the prescriptions he has left to us all the diseases of the world's mind and soul may be cured.

Shakespeare's Macbeth demands of his physician: "Canst thou not minister to a mind diseased?" It is in this branch of medicine that Luke excelled. Though it is rather as a writer than a physician that he has gained fame, his writings entitle him to a high place of honour among the world's psychiatrists. How many minds, sick with foolishness and selfishness, have found relief in studying his textbook.—I am, etc.,

Banstead, Surrey.

HERBERT CAIGER.

Obituary

J. F. CARTER BRAINE, M.D., F.R.C.S., F.F.R.

Dr. J. F. Carter Braine, director of the radiotherapeutic department of Guy's Hospital, died at his home at Speldhurst, Kent, on September 20 at the age of 60.

Born on January 21, 1893, John Francis Carter Braine received his medical education at Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1916. After qualification he entered the R.A.M.C. and served in France and East Africa in the first world war. On demobilization he returned to Guy's as demonstrator of anatomy, and later was appointed Griffiths demonstrator in the department of pathology, a post he held for some years, during which time he took the Durham M.D. in 1925, winning a gold medal for his thesis. He had previously graduated M.B., B.S. at Durham in 1920; in 1921 he took the D.P.H. of the English Royal Colleges; and in 1922 he obtained the diploma of F.R.C.S. It is interesting to recall that both his father and grandfather were Fellows of the Royal College of Surgeons of England.

Always attracted to radiotherapy, Carter Braine was chief assistant in the old actinotherapy department at Guy's Hospital from the mid-twenties, with the late Colonel W. Langmuir Watt, who died two months ago, as an assistant surgeon. In 1925 Carter Braine was appointed surgeon to the radiotherapy department of the hospital, and in due time he acquired a wealth of experience in this field of treatment, working, as he did, unceasingly to improve techniques and results, so that his selection in 1939 as director of the department was an obvious choice. In the same year he was elected a Fellow of the Faculty of Radiologists.

During the last war he acted as adviser in radiotherapy to the group officer in the Guy's sector, and when, in 1941, the Guy's U.S.A. Hospital was opened at the Wildernesse, near Sevenoaks, he helped to create in hurried accommodation a radiotherapy department which was in use until the end of the war, when it was transferred to Pembury Hospital. From 1941 to the end of hostilities it is estimated that Carter Braine travelled by road each year in black-out conditions at least 20,000 miles between Tunbridge Wells, Pembury, the Wildernesse, and London in the performance of his duties. The strain such calls made on his frame, robust though it was, must have provided fertile ground on which the seeds of his fatal illness were sown. His ability as an organizer showed itself most clearly during the war years; an inspiration to his staff, Carter Braine's enthusiasm and encouragement produced a remarkable loyalty in those under him.

He was civil consultant in radiotherapy to the Royal Navy, and was formerly surgeon in charge of the radium department at King Edward VII Hospital, Windsor, and radiotherapist to the West London Hospital. He was a foundation member of the Society of Radiotherapists of Great Britain and Ireland (now part of the Faculty of Radiologists). A member of the official British delegation to the fifth International Congress of Radiology held at Chicago in 1936, he was also assistant treasurer and a member of the board of management of the sixth International Congress of Radiology, held in London in 1950. Carter Braine had wide interests outside

his profession. His love of the countryside was shown in the careful husbandry of his farm. Art and architecture, too, appealed to him; and he was a competent photographer, as the fine clinical photographs and slides used in his department could testify. His unpretentious manner, his modesty, and his sympathy and understanding inspired the affection of colleagues and patients, to whom he was the beloved physician. A keen sense of humour and an even temperament ensured him many friends, who, with his widow and daughter, have suffered a very severe loss by his death.

L. A. ROWDEN, M.B., D.Sc., F.F.R.

The death occurred at Harrogate on August 16 of Dr. L. A. Rowden, a former president of the British Institute of Radiology, at the age of 82.

Leonard Alfred Rowden was born at Newcastle-upon-Tyne on March 23, 1871, and was educated at Lenzie Academy and at Glasgow and London universities, graduating M.B., C.M., with a commendation, at Glasgow in 1892. After graduation he was in general practice at Thirsk and Morley before finally setting up his plate on his own account at Leeds. The discovery of x rays by Röntgen in 1895 saw the birth of radiology, and it was to this branch of medicine that Dr. Rowden devoted most of his working life. He became one of the pioneers in the use of x rays, starting before the turn of the century, when the first plant at the General Infirmary at Leeds was installed at a cost of £5 15s., and he later fitted up his own electrical laboratory, one of the earliest of its kind in this country. In 1908 he was appointed director of the x-ray department at the General Infirmary at Leeds, and in 1910 he became radiologist to the Hospital for Women and Children, holding both positions until 1917. From 1910 to 1919 he was radiologist to the Leeds Public Dispensary, and he was also honorary consulting radiologist to Dewsbury General Infirmary. In the first world war he served in the R.A.M.C. from 1915 to 1919 at home and in France. After the war he returned to Leeds, where he remained until his last illness. He retired from practice in 1948. The ambulance movement in Yorkshire also received his support. He was examiner and instructor in the ambulance department of the old London and North-Eastern Railway, examiner for the St. John Ambulance Association, and he gave the Rowden challenge shield for yearly competition by the ambulance teams in Leeds workshops and factories.

Dr. Rowden was a past president of the British Institute of Radiology, the Society of Radiographers, and the Leeds and West Riding Medico-Chirurgical Society. A member of the British Medical Association for some forty years, he acted as one of the secretaries of the Section of Radiology and Medical Electricity at the London Annual Meeting of the Association in 1910, and when the B.M.A. met at Glasgow in 1922 he was president of the Section of Radiology. He also represented his constituency at eight Annual Representative Meetings from 1918 to 1927. In 1939 the honorary degree of D.Sc. was conferred upon him by the University of Leeds, and when the British Association of Radiologists and the Society of Radiotherapists of Great Britain and Ireland amalgamated as the Faculty of Radiologists in 1940 he became a Fellow of the Faculty. Dr. Rowden was always ready to help any young man who showed interest in x-ray work. He had a fine collection of positive prints and films, and nothing pleased him

more than to be able to show them to visitors. He was not a prolific writer, but his contributions to *A Descriptive Atlas of Radiographs* outnumbered all others. Latterly he was particularly interested in pelvimetry. He was one of the few pioneers who escaped injury through radiation. A widower, he leaves six sons and two daughters. His eldest son, Dr. W. H. Rowden, is in practice at Leeds.

The *British Medical Journal* has lost an old and valued contributor by the death, which took place in Edinburgh on September 27, of PHILIP FRANCIS SULLEY, London editor of the *Sheffield Daily Telegraph* and Parliamentary Lobby correspondent. For many years—indeed, the beginning of the association does not seem to be discoverable from the office records, but it may well have been 30 years or more—right down to the Parliamentary recess last summer, Sulley contributed Medical Notes in Parliament and generally acted as watchdog for the *British Medical Journal* over the proceedings at Westminster. This was, of course, only one of his extra-activities; his main job was to interpret Parliamentary doings to Yorkshire in the form of a London Letter; but he did it, as he did everything else, with great care, good judgment, and a profound knowledge of Parliamentary procedure, personalities, and affairs. He had also, which was very important for such work, a capacity for compression, and could condense into a few lines a statement or fragment of discussion when an amateur would have straddled across a page.

Sulley, who was in his seventieth year, was a Scotsman who, having passed through St. Andrews University, came south to make his reputation. He began his Parliamentary journalistic work about 1906, when the Campbell-Bannerman Government came into power. He had been chairman of the Press Gallery, and twice chairman of the Lobby. He was indeed the "father" of the Lobby, and was much esteemed by his colleagues as well as by Parliamentarians and others as a political journalist, able to express himself with frankness and wit, and always keen on safeguarding the highest standards of journalism. A year or two ago he had a severe illness for which he underwent an operation, and, although he returned to his accustomed haunts at Westminster, he was, as one of his colleagues expressed it, "rather like a winged bird." Proceedings in Parliament cover all human interests, and to dissect from the daily question times and from the debates in the House and its committees matters of interest in health and medicine called for an alert mind and no uncommon labour. But Sulley did his job admirably and his practised pen will be greatly missed.

We record with regret the death on September 7 of Miss WINIFRED LINTON, honorary F.C.S.P., formerly head of the department for remedial exercises at the Brompton Hospital.

Sir GEOFFREY MARSHALL writes: The death of Winifred Linton brings to an end a life of unremitting work which formed one of the stepping-stones for the spectacular rise of chest surgery and medicine in our time. She was trained as a nurse at St. Bartholomew's Hospital, and served as such with the Army in the Dardanelles in the first world war. After her return home she took up physiotherapy, and began her association with the Brompton Chest Hospital, where she developed and was head of the department for remedial exercises. There she worked first with the late Mr. J. E. H. Roberts, and then with the late Mr. Tudor Edwards, whose brilliant team-work set new standards in surgery which have since become standardized in every civilized country. Miss Linton was the most modest and self-regardless of women; but she was a genius. If the disability of a patient was explained to her, she would devise exercises and postural procedures which would reduce the disability to a minimum, and she would gain the confi-

dence and eager co-operation of patients of all ages and of every rank of society. A patient about to undergo a major operation, such as the removal of the whole of one lung, would be taught beforehand how to breathe and cough using the other lung only. She was equally successful in dealing with patients suffering from chronic disease, showing them how to overcome the shortness of breath associated with such conditions as asthma and chronic bronchitis. She trained many other physiotherapists, and her pupils have become heads of departments in hospitals here and abroad. She was a woman of small stature and of no special distinction in appearance; but her zest and her complete devotion to the relief of her patient carried instant conviction and made her respected and beloved. She had a delicious sense of humour, and she was a dear. Her work lives on and expands.

Dr. HOMER FORDYCE SWIFT, a former member of the Rockefeller Institute for Medical Research, died in New York on September 24 aged 72. He graduated M.D. New York and Bellevue Medical College in 1906. He was assistant pathologist and dermatologist at Bellevue from 1908 to 1910, and then became associated with the staff of the Rockefeller Institute. In 1914 he was appointed associate professor of medicine at Columbia University, and three years later obtained a similar appointment at Cornell Medical College. In 1912, with A. W. M. Ellis, he introduced the autoserosalvarsan method of treatment of neurosyphilis (the "Swift-Ellis treatment"). During service with the Allied Armies in France in 1918 he collaborated in the production of an important report on trench fever for the American Red Cross Society's Commission. He returned to the Rockefeller Institute as an associate member in 1918, becoming a full member three years later. He was made a physician to the Rockefeller Institute for Medical Research in 1936; he was a member of the Council of New York University from 1942 to 1946, and consultant to the Secretary of War during the same period.

Medico-Legal

CLAIM AGAINST DOCTORS FAILS

After a five-day hearing, Mr. Justice Finmore dismissed on October 9 at Birmingham Assizes a claim for damages for personal injuries by a man who contended that the injuries resulted from a supposition that he had venereal disease when he was actually suffering from cancer. Later amputation of the penis had been performed.

Daniel Edwin Hulse, 36, of Oldbury, Worcs, alleged negligence by Dr. C. J. Wilson, resident surgical officer, and Mr. J. H. Kirkham, stipendiary surgeon, both of the West Bromwich and District General Hospital, and also against the Birmingham Regional Hospital Board, who administer the hospital.

The defence was a denial of negligence.

Mr. E. Ryder Richardson, Q.C. (for Hulse), opening the case, said that in 1948 Hulse underwent a number of tests for venereal disease at a Birmingham hospital. The tests proved negative. He was also seen at West Bromwich Hospital. The pain increased, and on January 1, 1949, Hulse entered the West Bromwich Hospital, where they still thought he was suffering from the disease. An operation was performed and he was sent home three days later. In March Hulse saw another surgeon, who began deep x-ray treatment for cancer, but on July 25 an amputation operation was performed. Mr. Ryder Richardson alleged that the doctors had wrongly diagnosed a disease as the source of the trouble, instead of cancer, and Hulse was claiming damages for personal injuries.

Giving evidence, Hulse said he had nineteen operations altogether, including several plastic surgery operations.

His last operation was on May 27 this year, and he still suffered from pains in the lower abdomen and had spells of giddiness.

Dr. H. Barrada, Hulse's doctor, said he thought Hulse was fit enough to do clerical work, but unable to carry out many forms of manual work, to which he had been accustomed.

Mr. M. Harmer, of London, said that if the diagnosis of Hulse's trouble had been made earlier he might eventually have had to have only a partial amputation instead of a total one. The subsequent extensive plastic operations would also probably have been found unnecessary, because a man with a partial amputation was to a large extent able to carry on a normal life. He thought that a man who had only a partial amputation could work better, and there was less risk of infection, than if he had a total amputation. In his opinion, if Hulse had been treated in January, 1949, three months would have been saved, and the man might have escaped with a partial amputation, but he agreed in cross-examination that in 1948 a time lag of about six months before admission to hospital was not unreasonable for a minor operation.

Dr. William Henry Bond, consultant radiotherapist to United Birmingham Hospitals, said that the cancer did not respond to radiotherapy, but it would probably have been resistant to radiotherapy even if it had been diagnosed earlier. Having regard to Hulse's age, cancer was the least probable cause of this condition, and he thought Dr. Wilson had acted correctly under the circumstances.

Professor B. W. Windeyer, director of radiotherapy at Middlesex Hospital, London, said there was no reason why Dr. Wilson should suspect cancer when he first examined Hulse. In a man of Hulse's age such a cancer was extremely rare.

Professor F. A. Stammers, professor of surgery at Birmingham University, said he considered that Mr. Kirkham's actions after the minor operation in January, 1949, were quite reasonable.

Mr. Kirkham, giving evidence, said that he did not see Hulse at all until he performed a minor operation on him in January, 1953. The operation disclosed an ulcer, which might have been due to one of three causes. He considered cancer to be the least likely one, particularly in view of Hulse's age.

Mr. Vaughan (for Dr. Wilson and the regional hospital board), in his closing speech said there was a waiting-list of six to nine months in 1948 for operations at the hospital. There was nothing to induce any reasonably minded doctor to think that there was anything in Mr. Hulse's case requiring a higher priority than for the first operation—a very minor one.

On behalf of Mr. Kirkham, Mr. A. P. Marshall, Q.C., said that Mr. Kirkham had acted reasonably and properly in delaying the serious surgical cancer test until after the possibilities of inflammation and syphilis had been disproved. There was no evidence of negligence on Mr. Kirkham's part.

The judge, dismissing the claim, said that he found no evidence of any negligence against any of the defendants. There was no reason for Dr. Wilson to suspect cancer in the early stages, and at that time there was no reason for the case to be treated as one of urgency. Mr. Hulse had not been told to go back to the hospital if the pain became worse, but there was nothing to stop him going to his doctor, or to the hospital, if this happened. "I don't think you can blame the doctor for not saying 'Please come back' to him," said the judge.

Referring to the question of whether Mr. Kirkham should have diagnosed cancer when he discovered an ulcer during an operation, the judge commented: "The dangers of making a diagnosis too quickly are just as great as making a diagnosis too slowly. I don't think anyone can complain that Mr. Kirkham did not diagnose cancer straight away."

"I think the real gravity of the case against Mr. Kirkham was that he delayed too long satisfying himself beyond doubt that venereal disease was not the cause, and that he should have turned to the only other alternative—cancer. Such a cancer is extremely rare: in a young man of about 30 it is rarer still. Until you get rid of the other more likely causes you would not expect it was cancer in a man of this age." In any event, if Mr. Kirkham had at once diagnosed cancer no one could say that Mr. Hulse could have avoided an amputation altogether.

Messrs. Hempsons acted on behalf of the Medical Defence Union for Mr. Kirkham.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending September 26 (No. 38) and corresponding week 1952.

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

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

CASES In Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	29	2	3			21	2	12	1	
Dysentery ..	263	45	88	4	4	103	21	96	3	1
Encephalitis, acute ..	5	0	0	1		4	0	0	0	
Enteric fever: Typhoid ..	6	2	0	1	2	5	0	0	0	2
Paratyphoid ..	13	6	2(B)	0	1(B)	33	1	2(B)	0	0
Food-poisoning ..	274	20		2		160	20		0	
Infective enteritis or diarrhoea under 2 years ..				16	42				20	41
Measles* ..	492	13	76	15	32	2,590	272	59	25	61
Meningococcal infection ..	33	1	15	0		30	3	6	1	
Ophthalmia neonatorum ..	28	2	3	0		31	5	6	0	
Pneumonia† ..	245	13	122	1	1	261	12	165	5	
Poliomyelitis, acute: Paralytic ..	119	8	21	28	12	127	10	14	9	4
Non-paralytic ..	99	7				61	5			
Puerperal fever‡ ..	225	37	25	0		253	38	5	1	2
Scarlet fever ..	786	42	176	32	39	852	60	242	17	43
Tuberculosis: Respiratory ..			110	15				133	28	
Non-respiratory ..			24	3				27	9	
Whooping-cough ..	2,771	190	230	27	26	1,366	77	87	19	123

DEATHS In Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0		0	0
Dysentery ..	0	0		0	0	0	0		0	
Encephalitis, acute ..		0					1			0
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	10	1	2	1	3	6	0	1	1	4
Influenza ..	4	0	0	0	0	5	1		0	0
Measles ..		1	0	0	0		0		0	0
Meningococcal infection ..		0	0				0			
Pneumonia ..	120	15	16	4	5	133	20			4
Poliomyelitis, acute ..	7	0		0	0	9	0			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis: Respiratory ..	78	9	14	3	4	95	12	14	1	6
Non-respiratory ..		0	4	0	1		0	2		1
Whooping-cough ..	1	0	0	0	0	1	0		2	0
Deaths 0-1 year ..	223	24	24	3	19	191	17	25	10	13
Deaths (excluding stillbirths) ..	4,318	566	502	87	141	4,386	640	543	96	147
LIVE BIRTHS ..	7,494	1,098	818	217	349	7,368	1,128	798	198	361
STILLBIRTHS ..	185	27	22			188	23	21		

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

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending October 3 (39th week of the year) were as follows: paralytic, 79 (119); non-paralytic, 78 (99); total, 157 (218). This is a decrease of 61 compared with the previous week, the figures for which are in parentheses. The reduction is satisfactory, and there is no doubt that the drop to the winter levels of the disease is under way.

Cancer Statistics

The Royal Cancer Hospital, London, has issued the first of a series of reports giving detailed statistics on the type of cancer and results of treatment in patients admitted to it. It is entitled *Clinical Statistical Report* (Number 1), and covers the years 1945-9. The report includes figures showing the yearly survival and recurrence rates of all new patients with cancer, classified by site, age, sex, clinical stage, and histological type. In the words of its introduction, "It is intended for those who are seriously interested in studying the position as it is to-day rather than in advocating one particular treatment method or supporting some already entrenched belief." The authors are Mr. A. H. Hunt, Dr. J. B. Harman, Mr. M. H. Harmer, Mr. P. M. Payne, B.Sc., Professor D. W. Smithers, and Mr. K. M. Turner, B.Sc.

Infectious Diseases

The largest variations in the number of notifications of infectious diseases in England and Wales during the week ending September 26 were decreases of 784 for whooping-cough, from 3,555 to 2,711, and 116 for measles, from 608 to 492, and increases of 153 for scarlet fever, from 633 to 786, and 61 for dysentery, from 202 to 263.

The incidence of scarlet fever rose slightly in most regions of the country. The largest local variation was an increase of 38 in the number of notifications in Lancashire, from 117 to 155. The largest decreases in the number of notifications of whooping-cough were 103 in Yorkshire West Riding, from 317 to 214, 91 in London, from 281 to 190, 77 in Essex, from 223 to 146, and 73 in Glamorganshire, from 148 to 75. A small decline in the incidence of measles was recorded in most areas, but no large fluctuations were reported. 29 cases of diphtheria were notified; these were 4 more than in the preceding week and the largest total for 28 weeks. The largest local fluctuation in diphtheria was a decrease in Durham from 4 to 0. 6 of the 13 cases of paratyphoid fever and 2 of the 6 cases of typhoid fever were notified in London.

218 cases of acute poliomyelitis were notified during the week. These were 4 fewer for paralytic and 5 fewer for non-paralytic cases than in the preceding week. The largest returns were Warwickshire 29 (Coventry C.B. 11, Birmingham C.B. 7, Shipton-on-Stour R.D. 3), Lancashire 20 (Preston C.B. 5, Blackpool C.B. 4, Liverpool C.B. 4), London 15 (Lewisham 3, St. Pancras 3), Southampton County 12 (Bournemouth C.B. 3), Yorkshire West Riding 12 (Sheffield C.B. 3), and Northamptonshire 11 (Kettering M.B. 8).

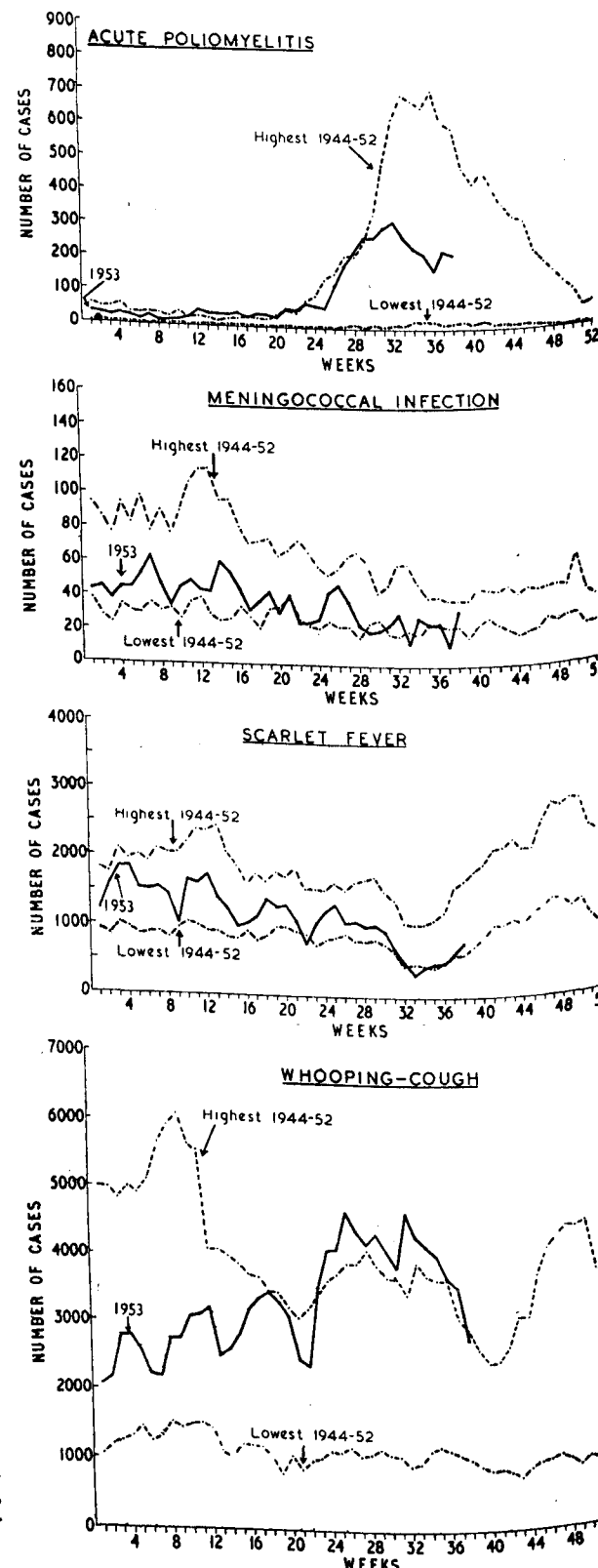
The largest centres of dysentery during the week were London 45 (Southwark 12, Chelsea 9), Lancashire 30 (Liverpool C.B. 7), Yorkshire West Riding 22 (Bradford C.B. 8), Durham 18 (Stanley U.D. 9), Middlesex 17, Kent 14 (Maidstone M.B. 9), Worcestershire 12 (Bromsgrove U.D. 12), Surrey 10, and Yorkshire North Riding 10 (Middlesbrough C.B. 10).

Week Ending October 3

The notifications of infectious diseases in England and Wales during the week included scarlet fever 992, whooping-cough 2,292, diphtheria 24, measles 621, dysentery 212, paratyphoid fever 16, and typhoid fever 10.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 are shown thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Medical News

Postgraduate Travelling Fellowships.—The British Postgraduate Medical Federation (University of London) is prepared to offer a limited number of Postgraduate Travelling Fellowships, tenable for one year, to registered medical and dental practitioners who are in the course of training as specialists in one of the preclinical or clinical branches of medicine, surgery, or dentistry, at one of the medical or dental schools or teaching hospitals and Postgraduate Institutes of the University of London. Further information about these Fellowships will be found in the advertisement columns.

The Pathologist in Court.—Speaking from the chair of the Medical Protection Society, to which he was unanimously re-elected at its annual meeting on October 7, Sir Ernest Rock Carling referred to the tendency in some coroners' courts for pathologists to express opinions on clinical matters. The pathologist had the remarkable advantage of being wise after the event and of entire exemption from the responsibility of having decided what the treatment of the deceased person should have been. He considered that in expressing such opinions the pathologist or morbid anatomist was stepping outside his proper province, and in his view coroners should not in future attach the importance some of them seemed to do to the clinical opinions of pathologists. Sir Ernest Rock Carling went on to say that the Society had been anxious about the attitude taken by some hospital authorities to complaints against members of their staff. In repudiating liability on its own account one authority had gone so far as to present the plaintiff with a series of points on which it was alleged a member of the staff had been negligent. One regional board had told its staff that they would individually be held responsible for any accident connected with blood transfusion which might occur at the hands of registrars, house-surgeons, and others looking after their patients. On these matters representatives of the defence societies and the British Medical Association had been conducting negotiations with the Ministry of Health, and there were signs that a different attitude between the employers and the employed staff in this respect might obtain in the future. He also referred to the tendency to increase the amount of damages awarded against doctors.

Charing Cross Hospital Medical School Dinner.—A record number of past and present students attended the annual dinner at the Savoy Hotel, London, on October 10, under the chairmanship of Lord Inman. The occasion was marked by farewell presentations to Mr. Norman Lake, the senior surgeon, and Professor H. W. C. Vines, head of the pathology department and formerly Dean, who are retiring under the age limit. Responding to the toast of "The Medical School" proposed by Dr. C. M. Scott, the Dean, Dr. E. C. Warner, reviewed the School's progress. This done, he turned to the main business of the evening. A fund had been opened to commemorate the many years' service by Mr. Lake and Professor Vines, and £720 had been collected. The bulk of the money would go to establish a Norman Lake prize for clinical surgery and to augment the Vines prize in pathology. Both Mr. Lake and Professor Vines, he was glad to say, would continue to work for the hospital, the former as chairman of the hospital research committee and, for a time, as director of surgical studies, the latter on the board of governors and the school council. Mr. David Trevor, to whom it fell to propose their healths, nicely blended reminiscence with appreciation. Mr. Lake had been on the staff for 34 years and senior surgeon for 20 years—surely a record. He would be remembered as a general surgeon in the widest sense of the word. Professor Vines, who had come to the hospital in 1928, was distinguished as an educationalist and an organizer. Above all, he was the force behind the planning of the new hospital at Harrow. The chairman then pre-

sented a tape recorder to Mr. Lake, on which the proceedings of the evening were being registered, and a cocktail cabinet to Professor Vines. Mr. Lake, whose speech will long be remembered, spoke of his great gratitude to the hospital, which had afforded him a "lifetime of most absorbingly interesting work." Professor Vines asked his hearers to remember that the life of an institution depended, not on its buildings, but on the enthusiasm and good will of its alumni. He predicted a rosy future for the Charing Cross School. These speeches were greeted with enthusiasm, and the evening ended with a vote of thanks to Lord Inman by Mr. Arthur Gray.

King's College Hospital Medical School Dinner.—The annual dinner of past and present students was held at the Dorchester Hotel, London, on October 3, with Mr. V. E. Negus in the chair. The toast of the chairman was proposed by Mr. W. I. Daggett, and Mr. V. E. Negus replied on behalf of himself and the guests, and gave the toast of the medical school. The wit of the speakers fittingly matched the brevity of their speeches, to the evident delight of the diners. It was announced that next year would be the 125th anniversary of the medical school, when it is hoped that a specially large number of past students will be able to take part in the celebrations.

The London Hospital Old Students' Dinner was held at the Trocadero Hotel, London, on October 8. Mr. George Neligan, from the chair, proposed the toast of "The Hospital and Medical School," which was replied to by Dr. A. E. Clark-Kennedy, who is retiring as Dean of the Medical College. Dr. A. G. Maitland-Jones proposed the chairman's health. Among the guests were Professor A. D. Gardner, Sir Lionel Whitby, Lieutenant-General Sir Frederick Harris, Surgeon Vice-Admiral Sir A. Ingleby-Mackenzie, Air Vice-Marshal J. M. Kilpatrick, and Sir James Spence, who had earlier in the day delivered the Schorstein Lecture on "The Varieties of Clinical Experience."

Charles Best Institute.—The new Charles H. Best Institute, at the University of Toronto, was officially opened on September 15, when Sir Henry Dale, O.M., turned a golden key in the door of the new building. The Institute will be used by the Department of Physiology for teaching purposes, research, and by the associated Banting and Best Department of Medical Research. At a special convocation held before the opening, the University presented honorary degrees to Dr. Detlev W. Bronk, the new Director of the Rockefeller Institute for Medical Research; to Dr. B. A. Houssay, of Argentina; to Dr. E. P. Joslin, of Boston; to Dr. W. G. Penfield, of Montreal; and to Sir Lionel Whitby, the Vice-Chancellor of the University of Cambridge. Convocation addresses were given by Sir Henry Dale and by Sir Lionel Whitby.

Italian Visit by R.S.M. Delegation.—At the invitation of the president of the Lombardy Region of the Italian Red Cross a small delegation of Fellows of the Royal Society of Medicine have been lecturing in Northern Italy. The party was led by Sir Gordon Gordon-Taylor, and included Sir Clement Price Thomas, Mr. L. R. Broster, Professor L. J. Witts, Dr. H. M. Sinclair, and Mr. R. T. Hewitt, secretary of the Royal Society of Medicine. Lectures were given at the Universities of Milan, Pavia, and Padua.

Opinion on Crime.—The Nuffield Foundation has invited Lord Pakenham, a Fellow of Christ Church, Oxford, and formerly Minister of Civil Aviation and First Lord of the Admiralty, to undertake a critical appraisal of current views of the causes of crime. He will be assisted by a small group of assessors, some of whom are medical. They are Dr. Desmond Curran, psychiatrist at St. George's Hospital, and Dr. T. C. N. Gibbens, lecturer in forensic psychiatry at the Institute of Psychiatry. The non-medical assessors include Dr. M. Grünhut, reader in criminology at Oxford, Mr. Frank Milton, a Metropolitan magistrate, and Mr. Leslie Farrer-Brown, secretary of the Nuffield Foundation.

Grenfell Association Christmas Cards.—Once again the Grenfell Association is offering Christmas cards for sale, all proceeds of which will be devoted to the maintenance and furtherance of the Grenfell Mission's medical work in Labrador and Northern Newfoundland. An illustrated leaflet giving details of cards available (ranging in price from 3½d. to 1s. 2d.) may be obtained from the association office, 66, Victoria Street, London, S.W.1, on receipt of 1½d.

Electroencephalographic Society.—At the annual general meeting of the Electroencephalographic Society, held at the National Hospital, Queen Square, on October 3, Dr. Denis Hill (Institute of Psychiatry), and Dr. Geoffrey Walsh (Edinburgh) were elected to the council to fill vacancies caused by retirement. The general meeting was followed by a series of papers. Summaries may be obtained from the honorary secretary, Dr. D. A. Pond, Maudsley Hospital, London, S.E.5.

The Annual Report of the Board of Medical Auxiliaries for 1952-3 records that the Association of Operating Theatre Technicians has been recognized as a qualifying body. A register of operating theatre technicians is to be published in due course. The British Dietetic Association has withdrawn its membership.

The Births and Deaths Registration Act, 1953, came into force on September 30. It simply consolidates, with a few minor amendments, previous legislation on the registration of births and deaths in England and Wales.

Sir James Learmonth, regius professor of clinical surgery at Edinburgh, has been appointed Sir Arthur Sims Commonwealth Travelling Professor for 1954 by the Royal College of Surgeons of England.

Sir Harry Platt will leave on October 24 for Cyprus and Israel for a two weeks' lecture tour under the aegis of the British Council. He will spend the first week in Cyprus, giving a number of formal lectures and clinical demonstrations, and the second week in Israel, where he will lecture, hold clinics, and operate in Tel-Aviv, Haifa, and Jerusalem.

COMING EVENTS

Cambridge University Courses for General Practitioners.—A series of one-day symposia for general practitioners will be held on Saturdays at Addenbrooke's Hospital during the academic year. The following programme has been arranged: October 24, "Tuberculosis and Other Diseases of the Chest"; November 14, "Disorders of the Blood"; December 12, "Dermatology"; January 9, "Obstetrics and Gynaecology"; February 6, "Infectious Diseases"; March 6, "Cardiovascular Diseases"; April 3, "Orthopaedics, Treatment of Injuries and Physical Medicine"; May 1, "Cancer"; May 29, "Paediatrics"; June 26, "Nervous Diseases"; July 24, "Diseases of the Ear, Nose, and Throat; Diseases of the Eye." Further information may be obtained from the secretary, the Medical School, Tennis Court Road, Cambridge.

University College Hospital Medical School.—The annual dinner of past and present students will be held at the Savoy Hotel, London, W.C.2, on October 30 at 7.30 for 8 p.m. Dr. Kenneth H. Stokes will be in the chair. Tickets (price £1 7s. 6d.) may be obtained from the dinner secretary, University College Hospital Medical School, London, W.C.1. On October 29 and 30 there will be the usual postgraduate demonstrations at the Medical School. These include a symposium on the treatment of severe hypertension.

27th General Hospital Reunion.—The annual dinner will be held at the Eccleston Hotel (near Victoria) on October 31 at 6.15 for 7 p.m. Tickets £1, inclusive of wine; informal dress. Those wishing to attend should communicate with Dr. L. S. Potter at B.M.A. House, Tavistock Square, London, W.C.1.

The British Occupational Hygiene Society.—The first conference of the society will be held on November 2 at

11 a.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. The Minister of Labour, Sir Walter Monckton, will open the conference, and Dr. T. Bedford will deliver the presidential address. The main subjects for discussion will be the measurement of the worker's environment, chemical toxicity, and occupational hygiene and the industrial designer.

SOCIETIES AND LECTURES

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

Friday, October 16

ROYAL EYE HOSPITAL.—5.30 p.m., Dr. A. A. Guild: Ocular Manifestations of Neurosyphilis.

Monday, October 19

● HUNTERIAN SOCIETY.—At Talbot Restaurant, 64, London Wall, E.C.4, 7 for 7.30 p.m., dinner meeting. Presidential Address by Sir Heneage Ogilvie: Life is Like That.

INSTITUTE OF NEUROLOGY.—5 p.m., Dr. Robert Aird (U.S.A.): Recent Work on Epilepsy.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: Lecture demonstration.

LONDON UNIVERSITY.—At Guy's Hospital Medical School, 5 p.m., Professor William Montagna (Brown University): The Architecture, Growth, and Differentiation of Skin.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. B. G. C. Ackner: Aches and Pains of Psychogenic Origin.

Tuesday, October 20

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor J. H. Burn, F.R.S.: Acetylcholine and Cholinesterase in Heart Muscle.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. I. Williams: Erythrodermia.

ROYAL EYE HOSPITAL.—5 p.m., Dr. R. D. Lawrence: Diabetes and the Eye.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Mr. A. M. Clave: Sexual Disorders.

SOCIETY FOR THE STUDY OF ADDICTION.—At Medical Society of London, 8 p.m., quarterly meeting. Presidential Address by Dr. H. K. V. Soltau: Scope and Effect of Institutional Treatment in Alcoholism. Discussion to be introduced by Professor A. D. Macdonald: Pharmacology of Addiction.

UNIVERSITY COLLEGE, LONDON.—At Anatomy Theatre, 1.15 p.m., Professor J. B. S. Haldane, F.R.S.: Physiology of Diving.

● Wednesday, October 21

LONDON UNIVERSITY.—At Guy's Hospital Medical School, 5 p.m., Professor William Montagna (Brown University): The Architecture, Growth, and Differentiation of Skin.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor N. H. Martin: Circulating Proteins in Health and Disease.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Urology Lecture by Mr. L. N. Pyrah: Uretero-colic Anastomosis: Technique, Management, and After-care.

Thursday, October 22

● ABERNETHIAN SOCIETY.—At St. Bartholomew's Hospital, London, E.C.4, 5.30 p.m., Opening Address by Sir Lionel Whitby: Devils, Drugs, and Doctors.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor F. G. Young, F.R.S.: Growth Hormone of the Anterior Pituitary Gland.

DURHAM UNIVERSITY: DEPARTMENT OF SURGERY.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, 4.30 p.m., Rutherford Morison Centenary Lecture by Sir Gordon Gordon-Taylor: The Rutherford Morison Tradition.

HARVEIAN SOCIETY OF LONDON.—8.15 p.m., Buckston Browne Prize Essay by Dr. Sheila P. V. Sherlock: Jaundice.

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Professor David Whitteridge, F.R.S.: Cardiovascular Disturbances in Paraplegia.

● INSTITUTE OF CARDIOLOGY, National Heart Hospital.—9.30 a.m., Professor M. L. Rosenheim: Oedema.

● INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY.—At National Hospital, Queen Square, W.C.1, 5.30 p.m., Sir Russell Brain: Aetiological Factors of "Acquired" Group (Virus Infections, Lipodosis, Vascular, Degenerative Diseases).

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Structure and Classification of Pathogenic Fungi.

INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—5 p.m., Professor F. C. Ormerod: Tuberculous Disease of the Upper Air Passages.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Professor J. S. Young: Dissemination of Malignant Tumours.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. K. G. Lowe: Acute Renal Failure.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. J. H. Paterson: neurology demonstration.

SOCIETY FOR CULTURAL RELATIONS WITH THE U.S.S.R.—7.30 p.m., Dr. B. Kirman: Impressions of the Soviet Health Services. Report of Visit to the Soviet Union.

Friday, October 23

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. H. J. Wallace.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 4.30 p.m., Mr. A. W. Bourne: Conservatism in Obstetrics.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—Mr. F. P. Rapet: Recent Advances in the Treatment of Some Common Urological Diseases.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., Dr. Lindsey W. Batten: Scope and Limitations of Preventive Medicine.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor E. J. Wayne: Clinical Evaluation of New Drugs.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson: Demonstration by Dr. G. D. Lumb: Irradiation Changes in Malignant Disease.

ROYAL EYE HOSPITAL.—5.30 p.m., Dr. A. A. Guild: The Myopathies.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—F. Alberts, M.B., B.S., D.A., Consultant Anaesthetist in Wisbech and Doddington Area; C. C. Smith, M.B., B.S., D.M.R.D., Assistant Radiologist in Peterborough and Stamford Area; M. Barry, M.D., M.R.C.P.I., Assistant Chest Physician at Ipswich Area Chest Clinic; D. P. F. Embleton, M.R.C.S., L.R.C.P., Senior Registrar in Chest Medicine at Ipswich Area Chest Clinic; T. J. Sullivan, M.B., B.Chir., Medical Registrar at Peterborough Memorial Hospital; S. K. Chatterjee, M.B., B.S., F.R.C.S., Surgical Registrar, Peterborough Memorial Hospital; K. N. Kamdar, M.B., B.S., D.M.R.D., Registrar in Radiology, East Suffolk and Ipswich Hospital; A. J. Abraham, F.R.C.S., Registrar in Plastic Surgery, West Norwich Hospital; J. V. Fennell, M.B., B.Ch., D.P.M., Consultant Psychiatrist in Ipswich Mental Hospital Group; J. L. Dunscombe, M.B., Ch.B., Assistant Pathologist to Hospitals in West Suffolk Area; L. Capper, M.B., B.S., M.R.C.P., Senior Registrar in Chest Medicine at Cambridge Chest Clinic; M. A. Birnstingl, M.B., B.S., F.R.C.S., Surgical Registrar, J. M. Brownlie, L.R.C.P.&S Ed., Orthopaedic Registrar, and E. R. S. Hooper, M.B., B.S., D.A., Anaesthetic Registrar, all three at Norfolk and Norwich Hospital; D. D. Guha, M.B., Surgical Registrar at West Norfolk and King's Lynn Hospital.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—E. Fischer, Ph.D., L.R.C.P. & S.I., Senior Hospital Medical Officer, Royal Western Counties Institution, Starcross, Devon; R. C. Allison, M.B., B.Chir., D.A., Assistant Anaesthetist (S.H.M.O.) to West Cornwall Clinical Area; J. A. Smith, M.B., B.Chir., F.F.R., D.A., Consultant Anaesthetist to Plymouth Clinical Area; F. S. W. Brimblecombe, M.D., M.R.C.P., D.C.H., Consultant Paediatrician to Exeter Clinical Area; H. P. Guerrier, M.B., B.S., F.R.C.S., Consultant Surgeon to Exeter Clinical Area (Torquay and Newton Abbot Hospitals); Kathleen J. Harrison, M.B., Ch.B., D.Obst.R.C.O.G., D.C.H., Registrar in Pathology, Frenchay Hospital, Bristol; A. G. G. Toomey, M.R.C.S., L.R.C.P., D.M.R.D., Senior Registrar in Radiology to North Gloucestershire Clinical Area; S. R. Hewitt, M.B., B.S., D.Obst.R.C.O.G., M.R.C.O.G., Senior Registrar in Obstetrics and Gynaecology, Plymouth Clinical Area; P. W. Seargeant, M.B., Ch.B., F.R.C.S., Surgical Registrar to Cossham/Frenchay Group of Hospitals, Bristol; Patricia M. Gilbert, M.B., Ch.B., Registrar to South-west Regional Blood Transfusion Centre, Southmead, Bristol; R. L. Batten, F.R.C.S., Surgical Registrar, Westover super-Mare Hospital; R. M. Norman, M.D., M.R.C.P., D.P.M., Research Consultant in Neuropathology; A. G. Freeman, M.D., M.R.C.P., Senior Registrar in General Medicine, Exeter Clinical Area; S. Mallick, L.R.C.P. & S. Ed., D.Obst.R.C.O.G., Registrar in Obstetrics and Gynaecology, Gloucestershire Royal Hospital, Gloucester; P. A. Oye Anyegbum, M.B., B.Ch., D.L.O., Ear, Nose, and Throat Registrar, South Devon and East Cornwall Hospital, Plymouth.

SWANN, W. G., M.D., D.P.H., D.Obst.R.C.O.G., Medical Officer of Health and Port Medical Officer of Belfast.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Eedy.—On September 16, 1953, to Francoise, wife of Dr. B. N. Eedy, 39, King Edward Avenue, Mansfield, Notts, a brother for Bernardine and Patrick—Michel.

Graves.—On October 3, 1953, at Kitts Croft, Writtle, Essex, to Valerie (formerly Scotland), M.B., B.S., wife of Dr. J. C. Graves, a son.

Macaskill.—On September 28, 1953, at the Boston General Hospital, to Daphne, wife of Dr. John S. M. Macaskill, 2, Church View, Coningsby, Lincs, a daughter—Elizabeth Mary.

Mills.—On October 1, 1953, in Birmingham, to Dr. Margaret J. Mills, wife of Wilfrid Mills, F.R.C.S., a son.

Ogan.—On October 4, 1953, at Queen Charlotte's Hospital, Goldhawk Road, London, W.2, to Ovidia, wife of O. Kesandu Ogan, M.R.C.S., L.R.C.P., D.R.C.O.G., a daughter.

Roddie.—On September 24, 1953, at Johnstone House, Royal Maternity Hospital, Belfast, to Alix P. M. Roddie (formerly Hurst), M.B., B.S., wife of T. Wilson Roddie, M.B., B.Ch., M.R.C.O.G., a daughter.

Shaw.—On October 5, 1953, to Joyce (formerly Dadds), M.B., B.S., wife of Kenneth V. Shaw, A.R.I.B.A., of Quarry End, Waltham, Darlington, Co. Durham, a son.

Shepherd.—On October 1, 1953, at Enfield, Middlesex, to Demetra, wife of Henry Robert Shepherd, D.S.C., M.B., Ch.B., a second son—Michael Charles.

Slovick.—On September 28, 1953, at King's College Hospital, London, S.E., to Pamela, wife of David Slovic, M.R.C.S., L.R.C.P., a daughter.

DEATHS

Alden.—On September 14, 1953, John Wenham Alden, M.B., B.Ch., of 186, Woodstock Road, Oxford.

Barer.—On September 22, 1953, at 29, The Avenue, Hitchin, Herts, Max Barer, M.B., B.S.

Bartlett.—On September 15, 1953, at Kisumu, Kenya, James Henry Bartlett, B.M., B.Ch., aged 44.

Clark.—On September 15, 1953, at his home, Lanadon Lodge, Churston Ferrers, Devon, John Clark, M.B., C.M., formerly of Radcliffe, Lancs, aged 82.

Dow.—On September 20, 1953, in a nursing-home, Edinburgh, Robert Charles Scott Dow, L.R.C.P.&S. Ed., L.R.F.P.S., F.D.S.R.C.S. Ed., of 4, Peel Terrace, Edinburgh.

Gibson.—On September 13, 1953, at Cartref, Terrick, Aylesbury, Bucks, Michael Joseph Gibson, M.D., F.R.C.O.G., late of Dublin, aged 77.

James.—On September 18, 1953, Robert Blake James, M.R.C.S., L.R.C.P., of Riverside, Hungerford, Berks, aged 84.

Jaques.—On September 20, 1953, at Worthing Hospital, Robert Jaques, F.R.C.S., of Worthing, Sussex.

Kahan.—On September 16, 1953, Nest Kahan (formerly Thomas), M.B., B.S., D.P.M., D.C.H., formerly of Kingston, Surrey.

Keats.—On September 18, 1953, Bertram Abbott Keats, L.M.S.S.A., of 37, The Ridgeway, Finchley, London, N., aged 71.

Kennedy.—On September 15, 1953, at Boughton-under-Blean, Faversham, Kent, Arthur Kennedy, M.C., M.B., Ch.B., aged 61.

Scott.—On October 2, 1953, at his home, 22, Longton Avenue, Manchester, James Murray Scott, M.B., Ch.B., aged 44.

Scroggie.—On September 20, 1953, in a nursing-home, Strirling, William Keith John Scroggie, C.I.E., M.R.C.S., L.R.C.P., Colonel, I.M.S., retired, of Abbotford Lodge, Callander, Perthshire.

Wills.—On September 22, 1953, Ronald Leonard Wills, M.R.C.S., L.R.C.P., of Sheerness, Kent, formerly of The Lizard, Cornwall.

Wright.—On August 22, 1953, at his home, Takapuna, New Zealand, John Edward Wright, M.B.E., F.R.C.S. Ed., F.A.C.S., L.D.S.R.C.S.

Any Questions?

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

Protection by A.T.S.

Q.—For how long does the usual prophylactic dose of A.T.S. (say 1,500 I.U.) confer protection against tetanus arising from (a) infected wounds, and (b) further infected wounds received several days later?

A.—(a) A single prophylactic dose of 1,500 I.U. (1950), which is equivalent to 3,000 I.U. (1928), is regarded by many surgeons as adequate insurance against the risk of tetanus. The protection is usually at its maximum two or three days after a subcutaneous or intramuscular injection of antitoxic serum, and then slowly diminishes as the A.T.S. is eliminated; it is probably very low after about three weeks. Occasionally, however, the duration of adequate immunity may be only a few days in some sensitive persons who have had previous injections of horse serum. If it is desired to prolong the period of protection, some surgeons double or treble the usual dose for cases considered to be tetanus-prone—for example, those with dead tissue or foreign bodies in wounds, particularly when there has been delay between wounding and efficient surgical treatment. But the more usual practice in such cases is to give two further doses, each of 1,500 I.U., at weekly intervals. There is no hard-and-fast rule. Children may be given the same doses as adults.

To-day emphasis is being laid increasingly on active immunization with tetanus toxoid. The first dose of toxoid may be injected, if desired, six weeks after the last dose of antitoxic serum.

(b) It is probably unwise to assume that the protection afforded by antitoxin, given more than a day or so previously, will be adequate in all persons. Another dose of serum is indicated.

Folic Acid and Diarrhoea

Q.—It has been my experience that folic acid checks the diarrhoea in both sprue and idiopathic steatorrhoea, often before there is any recognizable improvement in the blood picture. What is the explanation of this? On the contrary, I have failed to observe any improvement in the diarrhoea of coeliac disease in children when this is treated with folic acid. Why is this?

A.—During the war it was discovered that large doses of sulphaguanidine were effective in the diarrhoea of sprue, even though no pathogens were present. The same was true of crude liver extract. It is probable that the common action of these three agents—sulphonamides, liver, and folic acid—is a change of the intestinal flora to one which is less irritant to the mucosa. Cortisone may act in the same way or, more probably, by diminishing the irritability of the mucosa. At any rate, it is clear that, although diarrhoea, anaemia, and the defect in fat absorption are roughly parallel, they may diverge, particularly in the early stages of treatment. Diarrhoea usually improves first, next anaemia, and only after a long interval fat absorption.

It is probable that the pathology of coeliac disease is somewhat different from that of sprue, sensitivity to foods—for example, wheat gluten—being more important than disturbance in the intestinal flora. Moreover, the anaemia of coeliac disease is rarely megaloblastic. Deficiency of folic acid *per se* probably favours diarrhoea, as is suggested by the intestinal upsets of untreated pernicious anaemia. Finally, the consequential effects on the diarrhoea of improvement in the anaemia are not to be despised.

Homosexual Tendencies in Middle Age

Q.—What treatment is advised for a man in his fifties with homosexual tendencies which have been getting worse during the last year? This is causing him considerable worry. He is married, and has two children. He is physically fit, and has no signs of prostatic disease.

A.—Your questioner does not make it clear whether conscious homosexual tendencies were present before the patient reached his fifties, or whether they represent a new orientation. In the former case, no help could be anticipated from psychotherapy. In the latter case, it would be essential to establish the diagnosis (that is, the reason for hitherto repressed tendencies of this kind complicating the psychosexual picture) before thinking of treatment.

In either case, should moral and social considerations demand it, "biochemical castration"—that is, planned extinction of the sexual libido—should be considered. This can be effected by means of a daily dose of up to 15 mg. of stilboestrol. The possible side-effects must, however, be remembered.

Unilateral Premenstrual Mastalgia

Q.—I have a patient who for the past year has had mastitis in the left breast coming on fourteen days after a period. It lasts until the next period starts and has gradually been getting worse, the left arm being also affected by pain. On the last occasion, the pain started again on the second day of the period (which lasts only two to three days) instead of on the fourteenth day. Latterly, she has been having some pain in the right breast too. The pain is becoming very severe and, being more or less continuous, is making her ill and depressed. She had a similar occurrence some five years ago, but this lasted some six to seven months only. Is there any treatment?

A.—This condition is probably an exaggeration of the usual premenstrual mastalgia—an exaggeration which is part of a menstrual tension state. The breasts are often unequal in development and function, so it is common for this type of discomfort to be worse on one side. In this condition there is nearly always a background of overanxiety and frequently a fear of cancer. Indeed, the general illness and depression in this case are more likely to be the cause than the result of the pain.

The patient should be reassured and instructed to wear a well-fitting brassière. Her intake of fluid should be restricted to not more than 30 oz. (850 ml.) in 24 hours for two weeks premenstrually, and at the same time salt should be avoided as far as possible. Sodium retention is also discouraged by giving ammonium chloride 10 gr. (0.65 g.), in capsules, three times daily.

Hormone therapy is not very satisfactory for premenstrual mastalgia. Oestrogens may reduce the discomfort but at the expense of upsetting the menstrual cycle. Small doses of androgens are preferable but involve some risk of producing masculinizing effects. If the simple measures mentioned above are insufficient, then the first hormone to be tried should be ethisterone 5–10 mg. sublingually three times daily for ten days premenstrually. It is unlikely to have any undesirable side-effects and sometimes appears helpful.

Otitis Externa in the Tropics

Q.—Why is otitis externa so common in the Tropics? How is it acquired, and what measures of prevention are recommended?

A.—The external auditory meatus is lined with skin, and this is the only area of skin in the body which is not readily accessible for cleansing purposes. In consequence any excess of moisture either from perspiration or from water getting into the ear may cause maceration of the superficial epithelium, thus allowing organisms to gain entry and produce an acute inflammation. The common pathogens are the streptococcus, *Pseudomonas pyocyanea*, and certain fungi of the aspergillus group. Though the infecting agent

is different the mechanism of production of external otitis is similar to that responsible for athlete's foot. In both the infection is in an area of skin not always readily accessible and is most commonly found in visitors to hot countries. Unlike athlete's foot, however, otitis externa does not commonly spread from one person to another.

In the very acute stage great pain and considerable constitutional disturbance may be experienced, and rest in bed with sedatives and an antibiotic may be needed. Locally a wick of wool soaked in half-strength metacresyl acetate ("cresatin") and left in for a few hours will often give relief if combined with local heat. For a fungus infection 2% thymol in spirit may be needed.

The prevention of otitis externa in the Tropics is best achieved by preventing water from getting into the ear canal, and by using a mild oily mercurial solution as ear drops twice weekly (dilute mercuric nitrate ointment, 1 drachm (4 g.); expressed almond oil to 1 oz. (28.4 ml.)).

Resorcin Stains

Q.—Please can you tell me how to remove the brown stains of resorcin from a wash-basin?

A.—Fresh stains of resorcin may often be removed by sponging with alcohol, ether, or glycerin. Older stains should be treated with a warm 3% solution of citric acid. If the stain has seeped through cracks in the glazed surface of the porcelain, prolonged soaking may be necessary.

NOTES AND COMMENTS

Filatov's Tissue Therapy.—Dr. W. M. CORBET (of *Excerpta Medica*, Amsterdam) writes: Your expert dismisses the query about Filatov's tissue therapy ("Any Questions?" September 12, p. 634) somewhat lightly, and this misleads the questioner. Many enthusiastic reports have appeared, and continue to appear, more especially in the Italian and Spanish literature.

OUR EXPERT writes: I am quite certain that I have not misled the questioner as to the therapeutic value of Filatov's treatment, though I may have been slightly misleading in suggesting that nearly all the references were confined to French and Russian journals. I do not think it is a matter of any importance.

Car Sickness in Small Children.—Dr. FRANCIS LESLIE (London, S.W.1) writes: Some children are completely cured of car sickness and the feeling of nausea ("Any Questions?" August 29, p. 519) if the car is earthed by means of a metal chain attached to a bumper, provided that one or two links of that chain touch the ground at slow speeds or when the car is stationary. A car, just because it is insulated by rubber tyres, must presumably possess quite an appreciable electrical charge similar to the rubber-tyred operation theatre trolley, and the fact that some children are cured of sickness and nausea by the earthing of the vehicle suggests that an electrical charge is responsible for their symptoms. I know of one firm of car agents who did not like the appearance of a chain hanging from a car delivered to one of their clients, and so they installed a metal tube under the car through which passed the earthing chain, and reserve chain could be released as the end links were worn away by contact with the road surface. Surely these facts invite fuller investigation, and I would welcome the comments of those with children who suffer from car sickness or nausea.

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

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent*, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the British Medical Journal alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Brimedada, Westcent*, London. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: *Mediacora, Westcent*, London. B.M.A. SCOTTISH OFFICE: 7, Drumshough Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 31 1953

THE PLACE OF FORCEPS IN PRESENT-DAY OBSTETRICS*

BY

T. N. A. JEFFCOATE, M.D., F.R.C.Sed., F.R.C.O.G.

(From the Department of Obstetrics and Gynaecology, University of Liverpool)

The Former Place of Forceps

The invention of the forceps was probably the most important event in the history of obstetrics, for dissemination of knowledge of the instrument, coinciding as it did with the first serious incursions of the medical profession into the realms of midwifery, gave the supremacy to the man midwife and afforded him, for the first time, opportunities for the study of normal as well as abnormal labour—a study from which all modern knowledge has come. So great an advantage did this instrument give the obstetrician of two centuries ago that it became hated by the midwives, who did everything possible to discredit it in the eyes of parturient women. It was this attitude which prompted Smellie and others of his day to use wooden- or leather-covered forceps, which, being devoid of a tell-tale metallic rattle, could be applied surreptitiously without the knowledge of either patient or handymaid.

The early patterns of forceps were short and straight, so they can have been used only when the foetal head was low in the pelvis. This, together with the fact that anaesthesia was not available, must have given them a high degree of safety and freedom from certain, although not all, misuses. It might therefore now be argued that it was unfortunate that the early instruments were very soon lengthened, curved, and supplied with axis-traction mechanisms, because it was these modifications which not only allowed but encouraged the accoucheur to reach higher and higher for the foetal head. It should be noted, however, that Smellie lengthened and curved his forceps primarily for use on the aftercoming head, and he always preferred the short straight instrument when the head presented, insisting that the presenting part must be low before they could safely be applied (see Johnstone, 1952). Responsible obstetricians of the past always recognized and taught that forceps are useless for overcoming major degrees of disproportion, but inexperienced and less skilful practitioners repeatedly tried them when the pelvic brim or cavity was contracted—with disastrous results. The objection to forceps, based initially on prejudice and vested interests, thus quickly became justified by their abuse.

With more general observance of the rules governing the safe use of forceps, the instrument gradually became

more popular, but even to-day it has not completely lived down its evil reputation. It achieved a clearly defined place in obstetric practice during the latter half of the nineteenth century, and this place remained relatively static until about 25 years ago. At that time, when many of us were undergraduates, the high-forceps operation was banned even if it had not completely disappeared from the practice of the unscrupulous and less learned. Mid-forceps and low-forceps operations were regarded as proper in both domiciliary and hospital midwifery, but only as a last resort, conservatism in their use being justified by the risk of sepsis if by nothing more.

Recent Developments in Obstetric Practice and Results

The last 25 years has seen a revolution in obstetrical methods and outlook, a revolution which has, or should have, modified our views on the place of forceps as on other matters. The main factors in the revolution are well known: the introduction of the lower-segment type of caesarean section which made abdominal delivery safe even when carried out late in labour; the discovery of sulphonamides and later of antibiotics; the provision of facilities for immediate and adequate blood transfusion; developments in anaesthesia; the extension of antenatal supervision to cover practically all pregnant women; the increased facilities for hospital delivery; and the upgrading of maternity hospitals and of their staffs. These and other changes have brought about a dramatic fall in the mortality and morbidity rates not only of the mother but also of the child. Indeed, in some respects modern trends are better shown by foetal than by maternal results.

The fall in the stillbirth and neonatal death rates is here illustrated by the experience of the Liverpool Maternity Hospital for the 25 years 1926–50, an experience which covers the birth of 50,622 babies (Fig. 1). During this period the neonatal death rate was reduced by one-third, and the stillbirth rate by two-thirds. Moreover, there was an important change in the relative importance of the various causes of foetal death (Fig. 2). Birth injury, which has long been credited with approximately 33% of deaths, now accounts for less than 10% of stillbirths and neonatal deaths. Intranatal and neonatal asphyxia still take a heavy toll, mainly because of associated prematurity. Foetal malformation becomes relatively more important as preventable causes disappear.

*Read in opening a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Cardiff, 1953.

All manner of factors have played a part in this reduction in foetal mortality, and it is impossible to apportion the credit exactly, but study of the results suggests that it is mainly due to better intranatal care of the foetus. This in turn is the result of the appointment of *resident* obstetricians of greater skill and experience and, along with this, a change in obstetric management. In obstetrics, as in politics, the last quarter-century has seen a swing from the conservative to the radical outlook. There has been more and more interference with natural delivery, no matter whether the foetus presents by the head or by the breech. Thus the forceps delivery rate has risen from 6-7% to 16-17% of total births (Fig. 3), an increase which has occurred at the expense of spontaneous delivery and not of caesarean section. Indeed, during the 25 years the section rate also rose

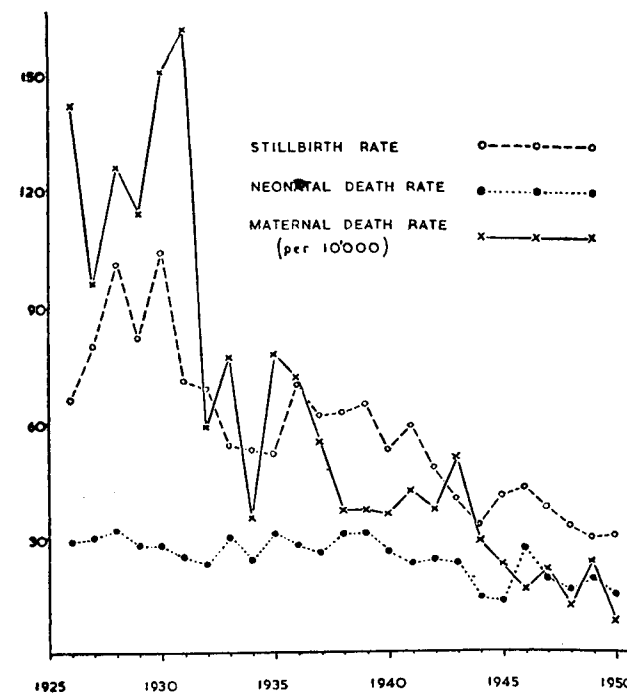


FIG. 1.—Diagram showing the change in maternal and foetal results at the Liverpool Maternity Hospital during 25 years.

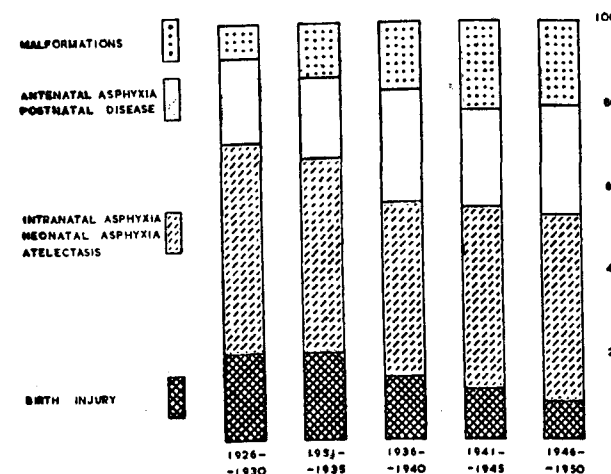


FIG. 2.—Relative importance of various causes of all foetal deaths for five-year periods during 25 years, shown in percentages. "Intranatal and neonatal asphyxia and atelectasis" includes deaths associated with prematurity except where there was definite evidence of intracranial injury. "Antenatal asphyxia" includes all deaths *in utero* before the onset of labour.

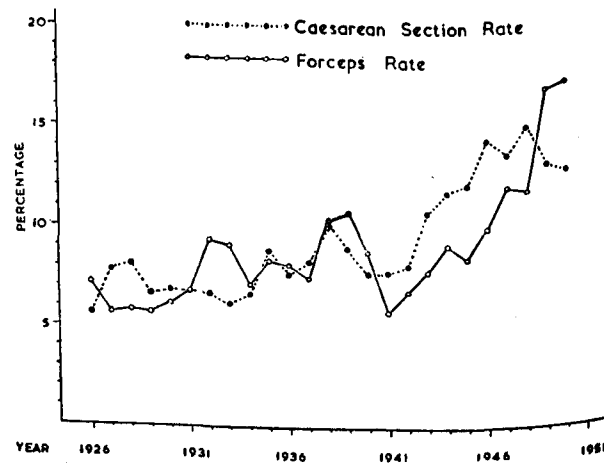


FIG. 3.—Rates for caesarean section and forceps delivery expressed as percentages of all births in the Liverpool Maternity Hospital during 25 years.

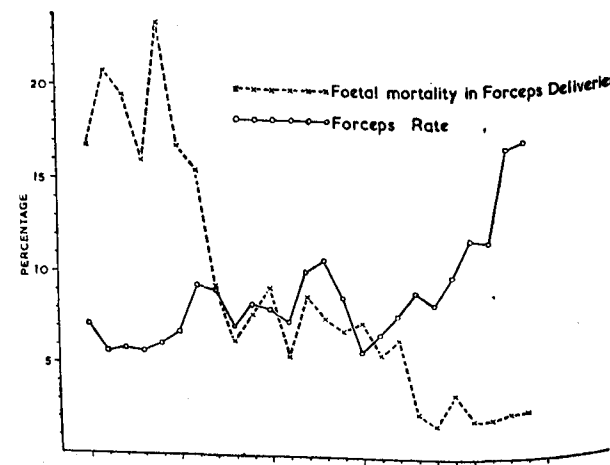


FIG. 4.—Diagram showing the falling foetal mortality associated with forceps delivery. Foetal mortality in this and other tables includes both stillbirths and neonatal deaths.

from 5 to 15% (Fig. 3). Altogether, in a hospital which deals with highly selected material and includes a high proportion of abnormal cases, approximately one-third of the babies are now delivered either by forceps or by caesarean section.

Decreased Risks of Forceps Extraction

Not only have the forceps operations increased in number, they have at the same time decreased in risk. Thus the foetal mortality attending the operation has fallen from 20 to 2% (Fig. 4). At the same time the danger to the mother has become very small. During the last 15 years of the period under review 3,522 women were delivered with forceps and 13 died. The fatal outcome was unrelated to the operation in at least seven of these; in the remaining six anaesthesia was the cause of death of three women and contributed to the death of a fourth. There was only one case, in 1941, in which the operation was the direct cause of death. In this, severe shock developed after a difficult mid-forceps delivery.

The risks of forceps have been reduced by changing their method of use and their indications.

Changes in Technique

Under this heading many matters might be mentioned: the discarding of all forms of axis-traction instrument; the substitution of skill for force in traction; the use of episiotomy; the correction of the position of the foetal head

before or after the application of the forceps, and, more recently, the use of local analgesia. The most important of all changes in technique, however, has been the ever-increasing emphasis placed on the accurate application of the blades to the sides of the foetal skull.

Changes in Indications

The decision on when forceps can safely be used is probably more important than knowing how to use them, and a modification in outlook regarding the time and place for forceps is a striking feature of the obstetrical revolution of the last 25 years, and the main reason for the improvement in results. This modification in outlook is not unrelated to other developments. The increased safety of caesarean section has, for example, done away with the need to use forceps in cases mechanically obstructed late in labour. Whereas formerly only the high-forceps operation was condemned, it has gradually but convincingly been demonstrated that many mid-forceps operations, even though technically possible, are prejudicial to the health

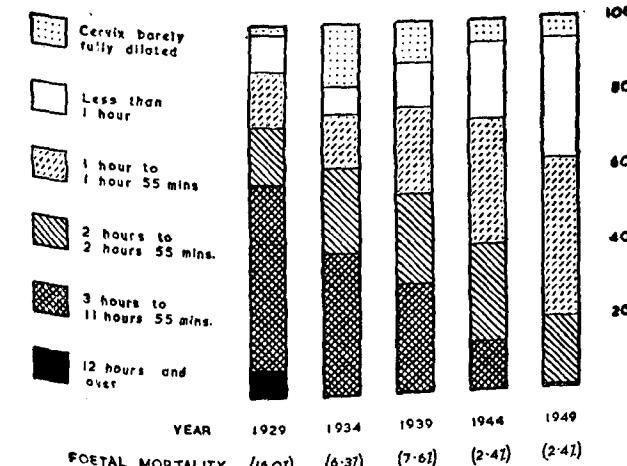


FIG. 5.—Duration of the second stage of labour in cases of forceps delivery, expressed in percentages. 1929 is the first year for which details are available. "Cervix barely fully dilated" refers to those cases in which the anterior lip was not fully taken up or in which cervicotomy was carried out.

and life of both mother and child. Difficult mid-forceps operations have therefore become fewer and fewer, the safer alternative of caesarean section being preferred. On the other hand, the number of forceps deliveries has become swollen at the expense of what would have been spontaneous deliveries had the second stage been allowed to continue longer. The situation might be summarized by saying that babies previously born dead with forceps are now being delivered alive by caesarean section, while those stillborn as a result of spontaneous delivery are now extracted alive with forceps.

Formerly, in accordance with conservative principles, the second stage of labour was allowed to continue almost indefinitely provided foetal distress did not develop. This usually meant that when it was finally decided to use instruments not only was the mother exhausted but the foetus was asphyxiated and already suffering from cerebral congestion if not more serious damage. A baby in poor condition was then subjected to anaesthesia and to the trauma involved in rotation and extraction, with considerable risk of a fatal outcome.

The ever-improving results are associated not only with more frequent use of forceps but with their more timely use. The trend towards a shorter duration of the second stage prior to forceps delivery is shown in Fig. 5.

Indications for Forceps Delivery in Modern Practice

Nearly every student taking the final examination, if asked the indications for forceps, gives priority to "maternal

distress" and "foetal distress." It is the traditional answer, but is it still acceptable? If by maternal distress is meant physical exhaustion manifested by a rising pulse rate, prostration, ketosis, and possibly pyrexia, then it should no longer be accepted as an indication for forceps. It is indefensible to allow any woman in the second stage of labour to reach such a state, and forceps extraction (if it is the appropriate treatment) should have been carried out much earlier. Similarly with foetal distress. This condition may come on suddenly and without much warning, in which case immediate forceps delivery is called for, provided the usual conditions are satisfied. In most cases, however, prolongation of labour and slow advance give ample warning that foetal asphyxia is likely to develop. In all such cases the distress should be anticipated and forceps applied while the foetus is in relatively good condition. Good obstetrics calls for intelligent anticipation, and if it is clear that the presenting part is held up on the perineum it is unjustifiable to withhold assistance because an arbitrary time limit has not expired or because the foetal heart is steady. Similarly, if the mother and baby have been exposed to a long and tiresome first stage of labour it can be assumed that neither is well fitted for the ordeal of the second stage, and that they will show evidence of stress sooner or later.

One condition which deserves special mention is uterine inertia in the second stage of labour. There are still some who, fearful of poor uterine action in the third stage, recommend deferring delivery. This outlook again is a relic of the past and takes no account of modern efficient methods for preventing and controlling post-partum haemorrhage. With care over anaesthesia and with ergometrine at hand, forceps extraction is nearly always the best treatment of inefficient uterine action once the cervix is fully dilated.

A low-forceps delivery before evidence of foetal distress or before an absolute indication is present is often called a "prophylactic forceps" operation—a term introduced by De Lee in 1920. It was some time before it was accepted in this country, and it has caused derision amongst older obstetricians, who regard it as an excuse for meddling some midwifery. I am not concerned to defend the term, although it is expressive in that it indicates that the operation is preventive—preventive of foetal asphyxia and death, preventive of maternal injury and nervous stress. I am concerned, however, to justify the use of forceps as a leisurely planned operation *before* the onset of a situation which results in their use becoming dangerous. Even if the prophylactic forceps operation is sometimes an unnecessary operation, no harm comes of it in skilful hands.

It is necessary to recognize, however, that the freedom with which forceps can safely be used must vary with the circumstances under which midwifery is carried out. The decision in each individual case must always rest on whether the application of forceps is safer for mother and child, bearing in mind the skill of the obstetrician, the availability of assistants, and the facilities and equipment of his environment. The indications are therefore different in domiciliary and hospital practice.

Domiciliary Practice

Outside hospital it is probably wisest and safest for no one, no matter how expert, to attempt any forceps delivery unless the vertex is below the level of the ischial spines and is visible at the vulva. Even then it is necessary to ensure that the head is really as low as it appears and that the signs are not deceptive because of shallowness of the pelvis and extreme moulding and caput formation. No part of the head should be palpable abdominally. If high standards of asepsis cannot be maintained, and if an anaesthetist is not available, it is usually best to leave it to Nature as long as is reasonably possible and until a clear indication for delivery is present. There is only a limited place for a "prophylactic" operation in domiciliary practice.

Hospital Practice

Granted a fully equipped and expertly staffed hospital, a low-forceps operation combined with episiotomy can usually be carried out with impunity, and therefore with freedom. It involves less risk for both mother and child than does a spontaneous delivery after a protracted second stage of labour. No matter whether the occiput be anterior or posterior, it does not require rotation at this level in the pelvis. Care has to be taken to exclude such possibilities as contraction of the bony outlet, but this is a bogey which has been grossly exaggerated. Outlet contraction sufficient to cause real difficulty is exceptionally rare in a pelvis where inlet and cavity are adequate.

Even in hospital, however, a mid-forceps delivery must be approached with caution, recognizing that it almost always involves dealing with an unrotated head. This does not mean that the head is malrotated; it is normal for the sagittal suture to remain transverse or oblique until the vertex reaches a low level. Other speakers are dealing with the problem of the unrotated head, and I would stress the second difficulty associated with the mid-forceps operation—namely, the presence of previously unrecognized disproportion at the level of the mid-plane of the pelvis. Although in most cases the experienced obstetrician can sift the cases accurately and decide beforehand which will deliver easily with forceps and which will not, there is always the possibility of meeting unexpected difficulty, and particularly so in a multigravida with an unusually large baby. The likelihood of an error in judgment is reduced by intranatal radiography, facilities for which should be available in all maternity units.

It is in the case in which forceps have been applied, and in which unexpected difficulty is encountered, that tragedy may occur. The tragedy results from a train of human reactions which have personal pride and prestige as their basis. We have all experienced them. The unexpected resistance to delivery is followed by a stronger pull and then removal of the blades to confirm the position of the foetal head. Further traction with little effect brings to mind the vision of a stillbirth. Now is the time to stop, but the patient and her relatives have been prepared for forceps delivery, not caesarean section. Moreover, it requires much courage to admit to assistants, midwives, and onlookers that a mistake has been made and that vaginal delivery is not safe. The remote possibility of successful delivery spurs the obstetrician to renewed and more frantic efforts. Now he is seized with dread, casts caution to the winds, and ultimately he may or may not succeed in extracting a mangled foetus, the mother also being injured in one way or another.

The situation is more dangerous if some progress is made than if the passage of the foetal head is completely obstructed. In the former case the foetal head is crowded more and more into an ever-decreasing pelvic diameter, with inevitable injury; in the latter it can come to no harm except from the pressure of the forceps themselves.

One of the fears which drive the obstetrician to make frantic efforts is that the case may become one of "failed forceps"—a label which by tradition involves everyone concerned with ignominy, and which itself can be responsible for bad obstetrics. How much better it would be if it were generally recognized that even the best exponents can make a mistake occasionally, and that failure to deliver with forceps is not so great a sin as a failure to recognize defeat at an early stage. If the forceps are applied skilfully no harm comes to the baby or to the mother, provided the attempts at extraction are discontinued immediately it becomes clear that there is greater difficulty than anticipated. All that is necessary is to have the courage to proceed to caesarean section before the life of the foetus is jeopardized.

Trial of Forceps

This raises the question of whether, under proper conditions, a "trial of forceps" is an acceptable procedure.

This means that when the head is arrested in the mid-pelvis forceps should be applied tentatively with the declared intent of abandoning the operation in favour of caesarean section if it does not proceed smoothly. The forceps need to be applied accurately to the foetal head, and traction has to be cautious. If all mid-forceps deliveries in hospital were viewed as trial operations the dread of failure would disappear from the mind of the operator and he would be happy not to proceed in the face of difficulty. The idea of a trial of forceps is not new. It was suggested and practised by Frank (1908) and again by Fraenkel (1925) and others in the 1920s. It has been recently advocated by Parry Jones (1952) and by Douglass and Kaltreider (1953).

When it was first introduced it was difficult to justify because of the maternal risk of caesarean section after interference *per vaginam*. Now, however, that this risk has largely gone, it should be re-examined and not discarded merely on the grounds of prejudice. It could, of course, be abused, and it has no place save in the hands of the expert working in hospital—the same qualifications which apply to the accepted practice of trial of labour. The only difference is that trial of labour is concerned with disproportion at the brim; trial of forceps is concerned with disproportion in the cavity. The trial of forceps may have only a small place, but if it has a recognized place it may well help to do away with the tragic condition of "failed forceps" and it may revolutionize the outlook of everyone concerned in any forceps delivery. As Douglass and Kaltreider (1953) point out, "It is a most comforting thought, when sitting down to do a mid-forceps operation, that one is not irrevocably committed to vaginal delivery."

Do Forceps Protect the Baby?

It has often been argued in recent years that the blades of the forceps, if properly and accurately applied, protect the foetal head from injury. The argument is not illogical, and its truth is already established in the special case of the after-coming head. The frequent and almost regular use of forceps for lifting the after-coming head from the cavity of the pelvis is one of the most important factors in the Liverpool Maternity Hospital (Cox, 1950).

Forceps are also said to protect the fore-coming head, especially the small and soft head of the premature baby (Studdiford and Salter, 1938; Scott, 1940; Assali and Zacharias, 1947). This matter still awaits proof, but in our experience forceps certainly do no harm and may do good so far as the delivery of small babies of toxæmic mothers is concerned (Hamilton, Jeffcoate, and Lister, 1949).

Advantages to the Mother

So far, the use of forceps has been considered almost entirely from the standpoint of the foetus. If under modern conditions this instrument must be regarded more and more as being primarily used in the interests of the child, it should also be recognized that Smellie, too, viewed it in this light and adopted it with the idea of reducing his stillbirth rate. It offers a means for speeding delivery to give the baby opportunity to establish its own respiratory function before the respiratory function of the placenta fails. Nevertheless, the question arises whether forceps bring any advantage to the mother. If properly used after full dilatation of the cervix, and in conjunction with episiotomy, and assuming asepsis, they should have no ill-effect. They are sometimes blamed for fistulae and other injuries, but these are mostly due to the condition calling for the use of forceps. They are clearly of advantage in that they shorten labour and spare the woman much mental and physical stress.

Do they prevent prolapse? There is some evidence to show that a prolonged second stage with overstretching and devitalization of the paravaginal tissues is more important

in causing prolapse than a quicker delivery with a tear or episiotomy. The matter is still *sub judice*, but meanwhile there is nothing to suggest that forceps in the hands of the expert do any harm to the mother, and they may be instruments of good as well as of mercy.

Dangers of Forceps in Modern Practice

The greatest danger of forceps delivery at the present time is anaesthesia, and this danger has, if anything, increased with the introduction of modern anaesthetic agents whose safety depends on increasing skill on the part of the anaesthetist. As mentioned previously, there have been six maternal deaths associated with forceps delivery in the Liverpool Maternity Hospital during the 15 years preceding 1950. Three of these were the result of the inhalation of vomit during induction of general anaesthesia, and the fourth was due to the effect of an anaesthetic on a diseased heart. Since 1950 there have been more cases of inhalation asphyxia and pneumonia as a result of vomiting during induction or recovery from anaesthesia given for the purpose of the application of forceps. This risk is very great when labour has been prolonged, as it has in many cases in which forceps delivery is indicated. The other risk is third-stage and post-partum haemorrhage associated with depression of myometrial activity by the anaesthetic.

To recognize these risks, and to have them ever present in mind, is to reduce them to a minimum. They constitute the chief reasons for advocating the use of local analgesia for all easy low-forceps extractions.

Conclusion

There is danger in praising forceps too highly and in claiming too large a place for them; it might encourage their abuse. There is also danger in adopting an ostrich-like attitude and failing to recognize that times have changed, and are changing. It will not do to condemn forceps merely on the grounds that they represent interference with Nature, if it can be shown that their results improve on those achieved by Nature.

The fact that childbirth is a physiological process does not necessarily mean that it is a benign one. The reproductive function in all species is both dangerous and wasteful. Nature is not concerned with making reproduction safe for individual mothers or offspring; she expects losses, and for this reason provides a supply of potential offspring which is so bounteous as to offset them and ensure the continuance of the race.

The natural maternal and foetal mortality rates are unknown, but it is quite certain that they are much higher than those which obtain when the medical and nursing professions stand by ready to interfere judiciously with Nature. Obstetricians do well to leave childbirth to Nature only so long as she is efficient, but when she fails—as she often does—lives can be saved only by carefully planned and skilful intervention. Moreover, as the means and methods for intervention become safer, they can offer more and more to the individual than can Nature.

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"FAILED FORCEPS": A REVIEW OF 37 CASES

BY

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During the period January 1, 1948, to May 31, 1952, 37 cases of "failed forceps deliveries" were admitted to the Norfolk and Norwich Hospital. Of these patients 21 were primigravidae and 16 multiparae. This paper is based upon an analysis of these cases.

Maternal and Foetal Hazards

A study of the recent annual reports of nine hospitals shows the maternal mortality rate in "failed forceps" cases to be 2.0%, while the foetal loss is 36.2%. So far as the risk to the foetus is concerned these findings are in reasonable conformity with those in the present series as shown in Table I. It will be seen that seven infants were

TABLE I.—General Analysis of the Present Series

	No. of Cases	Maternal Morbidity	Foetus Dead on Admission	Stillbirths	Neonatal Deaths	Total Foetal Loss
Primiparae	21	6 (28.6%)	2	3	1	4 (19.1%)
Multiparae	16	4 (25.0%)	4	4	1	5 (31.2%)
Total	37	10 (27.0%)	6	7	2	9 (24.3%)

stillborn, while a further two died during the neonatal period, the total foetal loss being 24.3%, or 22.2% if correction is made for one case of hydrocephalus.

Although no mother died as a result of this intervention, the maternal morbidity rate stood at the high figure of 27.0%. The remote prognosis for these patients may thus be less favourable than the immediate results suggest, since, as emphasized by Miller (1928), Clave (1931), Stacey (1931), and Feeney (1947), the sequelae of puerperal infection often persist for many years.

Duration of Labour

Table II shows that labour tended to be prolonged in these cases compared with normal vertex deliveries, this being most marked in primigravidae. In these patients the

TABLE II.—Duration of Labour in Failed Forceps Deliveries

	Total Cases	First Stage Over 24 Hours	Second Stage Over 2 Hours
Primiparae { Failed forceps* ..	19	12 (63.2%)	14 (73.7%)
{ Normal ..	185	36 (19.5%)	19 (10.3%)
Multiparae { Failed forceps* ..	11	2 (18.2%)	7 (63.6%)
{ Normal ..	215	22 (10.2%)	1 (0.5%)

* Excluding 6 caesarean sections and 1 case in which details were absent.

first stage lasted over 24 hours in 63.2% of cases, a finding that suggests that, in some cases at least, delivery may have been attempted for this reason alone. The second stage lasted more than two hours in 73.7% of primigravidae, and 63.6% of multiparae. This, however, was mainly due to the time expended in transferring the patient to hospital.

Past Obstetric History in Multiparae

The past obstetric history in the 16 multiparae is summarized in Table III. It will be seen that a history of previous dystocia was given by eight patients (50%), while of eleven cases in which details regarding the size of

TABLE III.—Analysis of Past Obstetric History in Multiparae

Case No.	Parity	Past History	Maximum Past Weight	Present Weight
4	6	Normal	8 lb.	10 lb.
6	1	Stillbirth. Cause unknown	6½ "	7 14
8	7	2 forceps deliveries	Unknown	7 8
11	4	Normal	7½ lb.	10 3
15	8	Forceps with last delivery	7½ "	6 8
16	1	"	7½ "	8 1
17	9	Normal	Unknown	7 13
19	1	Forceps. Occipito-posterior	7½ lb.	7 8
20	1	Normal	Unknown	7 8
22	4	"	6½ lb.	6 4
25	4	"	9 "	10 12
27	1	Forceps delivery	8½ "	10 4
28	2	Both forceps. First stillborn	10 lb. (S.B.)	10 10
30	1	Normal	8½ "	10 5
33	2	First forceps. Stillborn	Unknown	9 11
37	3	Normal	11 lb.	9 8

former infants were available, in no fewer than seven the present infant was larger than its forerunners and was thus capable of causing difficulties not previously experienced.

Causes of Failure

As pointed out by previous writers on this subject (Phillips, 1926; Murray, 1927; Miller, 1928; Claye, 1931; Stacey, 1931; Feeney, 1947; Browne, 1949; Freeth, 1950), the three fundamental factors responsible for failure to deliver the patient are disproportion, incomplete cervical dilatation, and some malposition of the foetal head. That two or more of these factors may be present in one and the same case is shown in Table IV, where, for the sake of clarity, the main cause is emphasized.

TABLE IV.—Causes of Failure to Deliver the Patient

	No. of Cases	Cause Present			Type of Cause		
		Single	Multiple	None	Disproportion	Undilated Cervix	Malposition of Head
Primiparae	21	14	3	4	3	3 (2)	11 (2)
Multiparae	16	7	7	2	4	3 (5)	7 (4)
Total	37	21	10	6	7	6 (7)	18 (6)

The numbers in parentheses indicate subsidiary conditions.

In 18 cases some malposition of the foetal head—usually an occipito-transverse or occipito-posterior position—was the main reason for failure. In addition this feature was observed in a further six patients, although here it was not the main cause. Thus, in 64.9% of cases the foetal head was not in a suitable position for a straightforward forceps delivery. By contrast, disproportion was present in only seven cases—three primiparae and four multiparae—an incidence of 18.9%. Incomplete cervical dilatation occupied a position mid-way between the two conditions already mentioned, being encountered as a main factor in six cases and as a subsidiary in a further seven, the total incidence being 35.1%.

It is interesting to note that these results compare closely with those observed in the much larger series reported by Freeth (1950), with the difference that malposition of the head was often observed in multiparae. This finding is also contrary to the views of Claye (1931), who was of the opinion that anterior rotation of the occiput almost invariably took place in these patients.

Method of Delivery in Hospital

This aspect of failed forceps deliveries, which was fully described by Freeth (1950), is summarized in Table V. Craniotomy was necessary in two cases only (5.4%). In one the foetus was hydrocephalic, while in the other, in which disproportion was present, the foetal heart sounds disappeared shortly after admission. This low incidence of destructive operations—Stacey (1931) gave the proportion

of cases thus delivered as 25%—together with the fact that caesarean section was carried out in six cases (16.2%), supports the prevailing view that the indications for section in cases of this nature could well be broadened.

Of the remaining 29 cases, 6 (16.2%) delivered themselves spontaneously after time had been allowed for full cervical dilatation to occur. A forceps delivery was necessary in 23 patients (62.2%). In this latter group seven of the deliveries were classed as "easy low forceps," the presenting part being on the pelvic floor and the occiput anterior. Thus in a total of 13 cases (35.1%) delivery ultimately presented no special problem, the original difficulty encountered in the attempted extraction having disappeared.

TABLE V.—Methods of Delivery in Hospital

	Spontaneous	Forceps				Caes. Section	Caes. Hyst.	Craniotomy
		Low	And Rotation	As O.P.	Total			
Primiparae	3	5	8	2	15	2	—	1
Multiparae	3	2	6	—	8	3	1	1
Total	6	7	14	2	23	5	1	2

Discussion

Taking into account the three main causes of failed forceps deliveries, it is evident that the incidence of these cases could best be reduced by timely recognition of disproportion, incomplete cervical dilatation, and malpositions of the foetal head.

Disproportion.—In most cases this abnormality can be recognized during the antenatal period. Although even in a primigravida the fact that the foetal head fails to engage at or near term is not necessarily indicative of disproportion, this must always be excluded. In every such case, therefore, clinical pelvimetry, supported if necessary by radiological assessment of the pelvis, should be carried out. This policy is the one generally followed in primigravidae. In multiparae the possibility of disproportion is often overlooked. To a large extent this is due to the belief that in these patients engagement of the foetal head before the onset of labour is the exception rather than the rule. Whatever the truth of this view, the fact remains that in some of these patients disproportion is present. This is shown in Tables III and IV, which suggest that stricter antenatal assessment is necessary in multiparae, especially with regard to the relationship between the size of the present infant and that of its predecessor. Recognition of disproportion after the onset of labour, although even more vital, is often more difficult. It is usually agreed that once the lowest bony part of the head has descended to the level of the ischial spines engagement has taken place. Although this is true in most cases, such a finding may be misleading either if excessive moulding has occurred or if the pelvis is abnormally shallow. At other times the presence of a large caput obscures the actual bony level of the foetal head. For these reasons it is safer to determine whether or not any portion of the head can be palpated above the symphysis pubis, it being taken that should any be felt delivery will be dangerous (Browne, 1949).

Incomplete Cervical Dilatation.—Although in theory full cervical dilatation can be present when a rim of cervix is still palpable, in practice this is rarely the case. It is therefore safest to assume that so long as any portion of the cervix can be felt on vaginal examination full cervical dilatation has not yet been reached. To attempt a forceps delivery under such conditions would be unwise. This rule should apply as rigidly to multiparae as to primigravidae. Although in the former patients the cervix is often reputed to be soft and easily dilatable this is not always so, the residual rim of cervix on occasion proving an effective bar to delivery. At other times delivery may only succeed at the expense of a dangerous cervical laceration. If indications to terminate labour arise before full dilatation,

SICKLE-CELL ANAEMIA IN THE ACCRA DISTRICT OF THE GOLD COAST*

A REVIEW OF TWENTY CASES

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incision or manual stretching of the cervix has been recommended (Browne, 1949). These procedures, however, have a limited application and are fraught with hazard. In such cases, therefore, it is probably wiser to transfer the patient to hospital.

Malpositions of the Foetal Head.—Since, as has been pointed out by Freeth (1950), it is unwise to assume that the occiput is necessarily anterior, it is essential to determine the position of the foetal head before applying the forceps. For this it is usually recommended that an ear be sought or, failing this, that the nape of the neck be identified (Browne, 1949). These measures, although possessing a high degree of accuracy, have the disadvantage that full anaesthesia is necessary for their proper application. This objection no longer obtains if use is made of the suture lines to determine the position of the occiput. These landmarks can easily be reached in most patients, and with practice a high degree of accuracy in their identification may be obtained. Late in labour caput formation may obscure these features to some extent, though in all but exceptional cases they can usually be made out with time and patience. If doubt still exists a good case can be made for examination under anaesthesia, the whole hand being passed into the vagina. Such a measure should, however, in no way commit the obstetrician to immediate delivery if the position of the head or the state of the cervix implies that this course would be unsafe.

Conclusions and Summary

An attempt has been made to determine the causes and assess the dangers, both to the mother and to the foetus, of "failed forceps deliveries."

The importance of these emergencies lies mainly in the fact that they represent a small subgroup of that category of deliveries loosely termed "difficult forceps" in which essentially the same conditions and the same dangers exist. Thus, as Fletcher Shaw (1928) pointed out, for every case in which failure occurs there must be many in which delivery is accomplished only after prolonged and dangerous traction, often through an incompletely dilated cervix.

The amount of maternal disability and foetal loss in these cases must be considerable. In consequence, every effort should be made to reduce the extent of this hazardous intervention.

Thirty-seven cases of "failed forceps deliveries" admitted to the Norfolk and Norwich Hospital are reviewed.

In over half of the multiparae consideration of the past obstetric history might have provided grounds for suspecting dystocia.

The causes of failure at the initial attempt at delivery were malpositions of the foetal head, incomplete cervical dilatation, and disproportion. This last factor, however, was not a common finding in the present series.

In a considerable proportion of cases (35.1%) delivery ultimately presented no particular problems.

Suggestions for the earlier recognition of the causes of failure have been discussed.

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It has been found impossible, in reviewing the literature, to assess the incidence of sickle-cell anaemia either in America or in Africa. The incidence of sickle-cell anaemia to the sickle-cell trait has been reported in America to vary from 1:2 (approximately) (Winsor and Burch, 1945) to 1:71 (Switzer and Fouché, 1948), with many intervening estimates. These figures show great disparity, but they do prove that sickle-cell anaemia is relatively common in America when it is remembered that approximately 900,000 negroes in the United States exhibit the trait (Beacham *et al.*, 1950).

On the other hand, the majority of writers in Africa regard sickle-cell anaemia as rare, in spite of the fact that the incidence of the trait in the African native may be more than double that of the American negro (Gelfand, 1944; Murray-Lyon, 1944; Beet, 1947; Robertson and Findlay, 1947; Mackey, 1949; Raper, 1950; Lehmann, 1951; Jelliffe and Humphreys, 1952; *British Medical Journal*, 1952). Smith (1943), however, estimated the incidence of the anaemia to the trait to be 1:5 in Nigeria, and Lambotte-Légrand (1951) stated that 6% of trait-positive Africans in Leopoldville suffered from sickle-cell anaemia. Foy *et al.* (1951), in Kenya, did not describe any cases, but stated that there were four cases of sickle-cell anaemia in the 13 trait-positive Africans examined, and concluded that the anaemia was commonest among infants and newborn babies. This statement, however, requires confirmation, as it has been shown that the neonate may be protected against sickle-cell anaemia (Watson, 1948; Edington, 1952), and there are only three reports in the literature of sickle-cell anaemia occurring under the age of 4 months (Cohen *et al.*, 1947; Frazier and Rice, 1950; Heldrich, 1951). Thus the part that the sickling phenomenon plays in the morbidity and mortality rates of the African native has still to be assessed.

I have diagnosed sickle-cell anaemia in 33 instances. Only one examination was possible in 13 patients, however, and these are consequently not considered in this review.

The following investigations were employed to discover those who were suffering from sickle-cell anaemia. (1) One patient was discovered on routine surveys of the population in which 2,255 Africans were examined and questioned. The findings are shown in Table I. It is not intended to discuss these surveys in detail. (2) Patients in the Gold Coast Hospital in whom a sickling test had been requested and found positive were examined. Of 60 sickling-positive patients investigated four were considered to be suffering from sickle-cell anaemia. (3) Patients in the Gold Coast Hospital showing many target cells in the peripheral blood smear on which routine differential counts were being performed

*This paper is based on part of a thesis submitted for the degree of M.D. of the University of Glasgow.

TABLE 1.—Incidence of the Sickle-cell Trait in 2,255 Africans, Showing Age, Sex, and Type of Group Examined

Age Group	Type of Group	Persons Examined		Males		Females	
		No.	Sickling	No.	Sickling	No.	Sickling
Newborn	Newborn	384	71	211	44	173	27
8-12 yrs.	School-children	200	36	100	19	100	17
12-24 "	Boys	327	48	327	48		
16-26 "	Nurses	428	90	85	12	343	78
Adults	Anaemia	123	9			123	9
"	Pregnancy	413	75			413	75
"	Patients	125	21	62	11	63	10
All ages	Villagers	255	57	113	22	142	35
	Total	2,255	407 (18%)	898	156 (17.4%)	1,357	251 (18.4%)

were examined. Of 50 patients investigated two were considered to be suffering from sickle-cell anaemia.

The remaining 13 cases were discovered among patients referred to me by medical colleagues as suspected cases for investigation.

Diagnosis of Sickle-cell Anaemia

The diagnosis of sickle-cell anaemia in Gold Coast Africans is not an easy task, as their "normal" values in clinical medicine are unknown. Colbourne *et al.* (1950), in an attempt to discover the "normal" clinical findings, thoroughly investigated a village of 255 inhabitants in the Southern Gold Coast. The diseases from which these villagers suffered are shown in Table II.

TABLE II.—Incidence of Diseases in a Village of 255 Inhabitants

Condition	%	Condition	%
Ancylostomiasis	52	Malarial parasitaemia	32
Ascariasis	76	Signs of malnutrition	26
Enlargement of liver	33	Schistosomiasis	9
" spleen	46	Streptococci	21
Guinea-worm infection	52	Yaws	75
Herniae	10	Sickle-cell trait	22

The blood counts and the haemoglobin and haematocrit values fell much below the standards regarded as normal in Britain. Malaria, liver disease, malnutrition, ancylostomiasis, and bilharzial infection are all capable of causing anaemia, and may all be found in one individual. The haematological findings in Africans suffering from anaemia may thus not be clear-cut. In one individual there may be present both a haemolytic factor (malaria) and a macrocytic factor (liver disease and malnutrition) in addition to an iron deficiency (ancylostomiasis and schistosomiasis). I thus had difficulty in deciding the criteria necessary for the diagnosis of sickle-cell anaemia. In the surveys it was decided primarily to rely mainly on the history given by the individual and to investigate thoroughly all cases in which a history of recurrent attacks of joint pain, vague ill-health, or jaundice was given. In addition, individuals showing more than 4% of target cells in peripheral blood smears were investigated, as Diggs and Bibb (1939) found these cells in all the 47 cases of sickle-cell anaemia they discussed. The method of discovering patients suffering from sickle-cell anaemia employed in the survey is open to criticism, but in the one girl in whom sickle-cell anaemia was diagnosed the history was dramatic and was not simulated by any of the other individuals examined and questioned. It should be noted that acute rheumatism is extremely rare in the Gold Coast.

Sickle-cell anaemia was not finally diagnosed unless the following criteria were fulfilled: (a) sickling of the erythrocytes; (b) signs of increased haemolysis in the peripheral blood with a persistently raised reticulocyte count; (c) lack of response of the haemolytic anaemia to antimalarial therapy; (d) a low erythrocyte sedimentation rate and lack of response of the joint pains to salicylate therapy; and (e) absence of any other condition which might be responsible for the haemolytic anaemia.

Methods Employed in the Investigation

The rapid bacterial method (Robinson, 1945) was used throughout to detect the presence of sickling. Haemoglobin was estimated by Sahli's method, using two haemoglobinometers which were afterwards kindly calibrated by Dr. J. V. Dacie at the Postgraduate Medical School, Hammersmith, and Dr. J. N. Marshall Chalmers at St. George's Hospital. The packed cell volume was estimated by centrifuging oxalated venous blood (Wintrobe's method) in a haematocrit tube at 3,000 r.p.m. for 30 minutes. Red- and white-cell counts were performed in three sets of pipettes which were checked against each other and against normal individuals (European). They consistently gave similar results, and it is not felt that grave inaccuracies have resulted. Reticulocytes were counted by the coverslip method, using an alcoholic solution of brilliant cresyl blue. Five hundred cells were counted. Target cells were enumerated on a thin blood smear stained by Leishman's method.

The 500 cells were counted by moving transversely across the centre of the smear and the percentage of target cells to the nearest whole number was calculated. Serum bilirubin was estimated by the use of a Lovibond's comparator. Coombs's test was performed, using dried anti-human-globulin serum supplied by the Ministry of Health Blood Group Reference Laboratory. The erythrocyte sedimentation rate was estimated in the manner described by Wintrobe (1947). No correction for anaemia was made. The bromsulphthalein excretion test was performed with a dosage of 2 mg. per kg. and blood was withdrawn at the end of 30 minutes. An alkalized portion of the serum was compared with prepared known percentage standards and acidified serum. The standard three-tube Kahn test was employed. Routine blood culture, Widal, and Weil-Felix tests were performed when considered necessary. It was not possible to perform investigations requiring the use of a colorimeter. The faecal urobilinogen output or haemolytic index was not calculated. Schlesinger's test was employed to detect urinary urobilin and the resultant colour was compared with a normal standard.

Review of the Cases

Three females and 17 males, representing six Gold Coast tribes, were considered to be suffering from sickle-cell anaemia (see Table III).

TABLE III.—Age and Sex Groups of 20 Cases of Sickle-cell Anaemia

Sex	No.	Age in Years					
		0-5	6-10	11-20	21-30	31-40	Over 40
Male	17	—	3	8	4	1	1
Female	3	—	2	—	—	1	—

In only five cases was it possible to examine both parents, and they all showed the sickling phenomenon. In another case one parent was available for examination and the erythrocytes also sickled. None of the parents were found to be suffering from sickle-cell anaemia. Twenty-three siblings were examined and five were considered to be suffering from sickle-cell anaemia; three of these five were in one family. The results of the examination of the families agreed with the homozygous theory of the inheritance of sickle-cell anaemia (Neel and Valentine, 1947).

Previous Histories

The previous histories in all cases were strikingly similar. A history of severe recurrent attacks of pain in the larger joints of the limbs was given. The first attacks had occurred in "infancy" in 12 instances, and the latest onset of the attacks occurred at the age of 7½ years. The present number of attacks a year varied from "continuous" to nil, the latter in an African male nurse, aged 44, who stated that the attacks had ceased at the age of 35. In nine

instances it was stated that the attacks became less severe as the patient became older, and in ten the attacks of joint pain were associated with cold weather. Wintrobe (1947) does not mention that sickle-cell anaemia may become less severe with age, but cold weather was regarded as a possible factor in precipitating the acute episodes of sickle-cell anaemia by Graham (1924) and Berk and Bull (1943).

In the Gold Coast, however, cold weather is associated with the rainy season and with an increase in the mosquito population and a corresponding increase in malarial infection. Knisely and Bloch (1942) described massive intravascular agglutination in vivax and falciparum malaria with local haemoconcentration and tissue anoxaemia resulting from the clumping of the erythrocytes. Similar findings were reported in the one case of sickle-cell anaemia they examined. Malaria may thus act as the "trigger" mechanism in precipitating a crisis in sickle-cell anaemia. Intravascular sickling could be produced by the local anoxaemia caused by the malaria parasite, with resultant increased stasis, increased sickling, and a further increase in the local tissue anoxaemia. A vicious circle would thereby be established. The history of a decrease in the number of attacks as the patient becomes older is also compatible with the theory that malaria may be a precipitating factor in the crises—the attacks lessening in frequency as the patient's premunity to malaria develops. It is suggested that in the Gold Coast the association between cold weather and the acute episodes of sickle-cell anaemia are in all probability associated with the greater incidence of malarial infection found during the rainy season.

Symptomatology

Seven of the 20 patients did not complain at the time of examination. The symptoms, in order of frequency, were: joint pains (11), fever (9), nausea (9), headache (5), abdominal pain (4), pains in the limbs (4), pain in the chest and lumbar pain (2), weakness (2), yellow eyes (2), eye complaints (2), dizziness (1), leg ulcer (1), and palpitation (1). In general the symptoms are those usually described in the literature. The eye complaints were, however, unusual, and micro-aneurysms of the retinal vessels were found in these two patients (Edington and Sarkies, 1952).

Clinical Signs

Eleven of the patients were asthenic and resembled the type of habitus described by Winsor and Burch (1944a, 1944b) with a short trunk and long slender limbs and fingers. "Tower" skull was noted in two patients and mongoloid features in a further two. Jaundice was noticeable in nine and scars of leg ulcers in seven. Active leg ulcers were present in one patient only. The elbow-joint was swollen in one patient and the small joints of the fingers in another.

The heart was considered to be enlarged clinically in five patients. Systolic bruits were present at the mitral area in four and at the pulmonic area in one. The blood pressure was consistently low. The incidence of cardiac complications in this series (25%) is lower than that usually reported, and figures as high as 95% have been recorded (Winsor and Burch, 1945).

Enlargement of lymph nodes was not a striking feature, but small rubbery cervical nodes were palpable in eight patients.

The liver and spleen were palpable in eight and 11 patients respectively. In only one patient was hepatic insufficiency marked, and the bromsulphthalein retention was 35% at the end of 30 minutes. The hepatic insufficiency gradually improved without improvement in the anaemia or in the signs of increased haemolysis. The aetiology of hepatic insufficiency in sickle-cell anaemia is obscure, but has already been described in five patients by Henderson (1950). The diagnostic importance of a palpable liver or spleen in the Gold Coast African is difficult to assess. "Normally" in children the liver may be palpable in 58%, and the spleen in 86%. In adults the figures are lower, and are in the region of 21 and

24% respectively (Colbourne *et al.*, 1950). The spleen in sickle-cell anaemia is enlarged in the younger age groups and diminishes in size with the progress of the disease until only a fibrosed remnant with a characteristic histopathological picture may be found. The spleen in races living in a hyperendemic malarial area follows a similar course, but the histological appearances are different and the small size of the fibrosed spleen in sickle-cell anaemia is not seen. In my opinion no reliance can be placed on enlargement of the spleen or liver as diagnostic points in sickle-cell anaemia in the Gold Coast African.

As already noted two patients revealed aneurysms of the retinal vessels, and dilated and tortuous retinal vessels were observed in a further two.

Blood Findings

The types of anaemia found in the 20 cases were normocytic orthochromic in 7, normocytic hypochromic in 4, macrocytic orthochromic in 1, macrocytic hypochromic in 4, microcytic orthochromic in 3, microcytic hypochromic in 1. These findings are discussed below. The haemoglobin varied from 4 to 14.2 g. per 100 ml. of blood, with a mean of 10.1 g.; the packed cell volume from 14% to 41%, with a mean of 31%; and the white blood cells from 5,400 to 25,300 per c.mm., with a mean of 11,000.

The most striking and constant feature, however, was the presence of numerous target cells in the thin blood smears of each patient. They varied from 32 to 87%. Sickle- or oat-shaped cells were seen in 10 instances and nucleated red cells in 14. The thin smear of one patient contained more nucleated red cells than white. Anisocytosis and poikilocytosis were features of the severe cases only. The reticulocytes varied from 3.4 to 25% and the serum bilirubin from 0.8 to 14 mg. per 100 ml. of blood. The Coombs test was negative in the nine instances in which it was performed. Howell-Jolly bodies were seen in three instances and Cabot's rings in one. The erythrocytes in all instances were more resistant to hypotonic saline than normal controls. The E.S.R. varied from 3 to 40 mm. in the hour, with a mean of 14.

The haematological findings in these cases agree closely with the reported findings of Diggs and Bibb (1939), who reviewed 44 cases. The procedure with the least number of variables in routine haematology is the packed cell volume. Unfortunately this does not hold in sickle-cell anaemia. The rapidity and degree of sickling vary from patient to patient, and the replacement, in varying proportions, of the flexible biconcave disk by a rigid oat- or sickle-shaped cell cannot but influence the packed cell volume. This change also influences the sedimentation rate of the erythrocytes, which is low in sickle-cell anaemia (Bunting, 1939; Diggs and Bibb, 1939; Altmann, 1945). The variation in the types of haemolytic anaemia diagnosed can be explained by this variability of the packed cell volume, from which the absolute values, used in the classification of the anaemia, are calculated. It should also be noted that Diggs (1932), discussing the blood picture in 74 cases of sickle-cell anaemia, stated that sickled cells in a blood smear were the exception rather than the rule. In this series sickled cells were seen in 10 instances only.

Examination of the Bone Marrow

Table IV illustrates the findings in nine patients in whom sternal marrow puncture was performed. The marrow in all cases was of thin consistency, and marrow fragments could not be satisfactorily separated from blood. The recorded results are therefore those of the "haemomyelogram." The nomenclature adopted is that of Israëls (1948). At least 500 cells were counted, and the results are shown in percentages. The cells enumerated under the heading "macronormoblast" resembled superficially the megaloblast, but the nuclear chromatin was clumped in blocks and could not be mistaken for the fine network arrangement of the true megaloblast.

Sickled cells were rarely seen in smears, and target cells were much more common, although in no case did they

TABLE IV.—Results of Marrow Biopsy Differential Counts in Percentages

	Case 1	Case 2	Case 4	Case 5	Case 7	Case 10	Case 11	Case 14	Case 19
Haemoglobin in g./100 ml.	9.1	6.1	7.5	7.5	9.0	7.7	4.0	6.6	14.2
P.C.V.	26%	21%	22.5%	26%	25%	26%	14%	22%	40%
W.B.C. per c.mm.	9,000	6,600	14,200	23,000	14,000	5,400	10,000	25,200	6,200
Haemocytohist	—	0.2	0.4	0.1	0.5	0.2	2.2	0.6	—
Proerythroblast	2.6	3.8	1.6	4.0	2.0	0.6	10.2	5.2	3.6
Normoblast:									
Early	3.2	6.6	2.0	3.0	4.0	1.2	3.6	8.6	4.0
Intermediate	1.8	11.6	5.6	8.0	14.0	14.0	8.2	12.0	7.0
Late	48.6	28.8	50.0	30.0	20.0	18.0	36.4	31.2	28.2
Mitotic	0.8	1.8	3.2	2.0	1.0	—	6.4	3.0	1.2
Macronormoblast:									
Early	—	—	—	—	—	—	—	—	—
Intermediate	—	—	0.2	—	—	—	—	—	—
Late	1.6	1.0	7.0	2.0	—	—	1.6	—	—
Myeloblast	—	—	—	1.5	0.5	1.2	3.4	4.4	0.2
Promyelocyte	1.0	0.8	0.4	2.5	6.0	0.4	2.0	—	2.0
Neutrophil:									
Myelocyte	0.2	1.0	1.0	3.0	3.0	8.0	5.6	0.4	8.2
Metamyelocyte	2.0	3.4	1.4	8.0	20.0	16.0	7.4	3.0	12.4
Polys	25.0	34.2	18.0	22.0	21.0	26.0	2.8	22.4	20.0
Eosinophils (total)	3.0	0.6	—	1.5	1.0	2.0	1.4	2.0	2.0
Basophils (total)	—	1.0	—	0.5	—	—	—	—	—
Lymphocytes	9.0	5.0	6.0	11.0	5.0	0.2	—	0.2	0.2
Monocytes	0.2	0.2	0.2	0.5	0.5	8.4	3.4	6.0	4.8
Plasma cells	1.0	—	3.0	0.4	1.5	0.8	0.4	0.8	—
Megakaryocytes	—	—	—	—	—	—	—	0.2	—
Myeloid-erythroid ratio	Normal 1:1.2	Normal 1:1.3	Normal 1:3.3	Normal 1:1.2	Normal 1:3.1	Normal 1:6.1	Normal 1:2.8	Normal 1:2.3	Normal 1:1.1

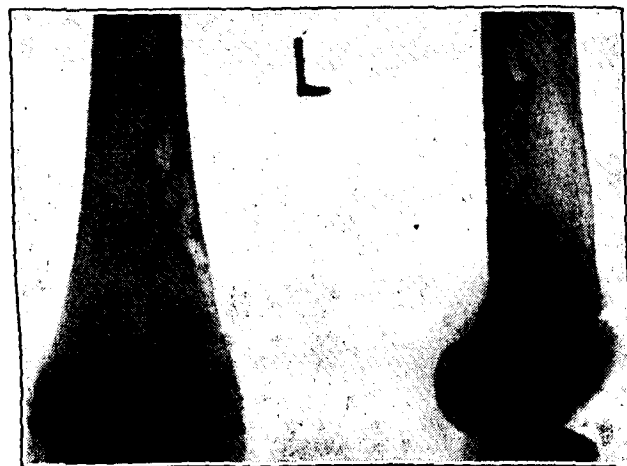
approach the numbers seen in peripheral blood smears. Nucleated red cells were never seen in sickled form in direct smears, although it is known that they are capable of sickling (Herrick, 1910; Sydenstricker, 1924a, 1924b; Diggs and Bibbs, 1939; Watson, 1948).

Malaria parasites were not detected in any of the marrow smears. In all cases a normoblastic hyperplasia was present; the myeloid-erythroid ratio varied from 1.6:1 to 1:3.3.

Radiology

Radiological changes which were considered to be due to sickle-cell anaemia were found in 9 out of the 17 patients who were x-rayed. Two mechanisms are thought to be involved in the production of the radiological changes described in sickle-cell anaemia: (a) hyperplasia of the bone marrow producing non-specific lesions which have been described in other haemolytic anaemias, the most important being Cooley's; and (b) lesions produced in bone by the blockage of blood vessels by sickled erythrocytes, with consequent infarction.

Lesions due to hyperplasia of the bone marrow were seen in nine patients and infarctive lesions were present in three. Absence of a well-defined outer table of the skull with perpendicular trabecular striations radiating outwards from the inner table, giving the "hair-on-end" appearance, was the most common lesion, and was seen in eight patients. A generalized mottling of the ribs with trabeculation in



Antero-posterior and lateral views of left femur, illustrating an infarctive lesion. Accentuated growth lines can also be distinguished. Case 2.

the direction of the long axis and enlargement of the heart were seen in two instances. Infarctive lesions in the femora (see Fig.) were noted in four patients, and changes in the tibia and fibula in one.

Treatment

Antimalarial treatment with mepacrine hydrochloride, 0.1 g. thrice daily for five days, followed by proguanil, 0.1 g. thrice daily for five days, was given to the 20 patients without relief, and crises occurred in two patients who were on suppressive proguanil therapy. Salicylates and aspirin did not relieve the joint pains or arrest the condition. Liver and iron therapy had apparently no effect on the anaemia.

In two cases splenectomy was considered for the mechanical relief that was thought might follow removal of the grossly enlarged spleen. It was felt, however, that, in view of the poor results of splenectomy in sickle-cell anaemia recorded in the literature and the absence of readily available blood for transfusion, the risks involved were not justified. One of these patients died some months after discharge from hospital. The cause of death could not be ascertained.

It was considered that the various treatments described above had no effect on the course of the disease in any patient.

Many drugs have been prescribed in sickle-cell anaemia, but few, if any, have proved of value. Diggs (1934) reviewed the literature and personally treated seven cases. Iron, copper, liver, and hog's stomach were therapeutically useless. Murphy and Shapiro (1945) confirmed these findings and added anticoagulants, blood transfusion, and salicylates to the list. Oxygen therapy has also been reported to have little effect on the crises (Hughes *et al.*, 1940). Leivy and Schnabel (1932) and Torrance and Schnabel (1932) believed that the administration of alkali and potassium sulphocyanate relieved the crises, and Grek and Findlay (1951) thought that oxygen inhalation combined with nicotinic acid given intravenously was of help if administered early in the acute crisis. Josephs (1938) reported that the injection of normal plasma or of a protein-free plasma concentrate reduced the rate of blood destruction in patients suffering from sickle-cell anaemia. Kaplan and Lewis (1949) confirmed these findings, but the effect was transitory and tended to reversal with repeated injections.

Course of the Disease

These patients have been followed up for periods varying from two months to four years. Only one patient has died. The remainder have been observed in and between crises. All grades of severity of the anaemia were seen, but even

when the haemoglobin was as high as 14.2 g. per 100 ml. signs of increased haemolysis were constantly present in the peripheral blood and urobilin was present in excess in the urine. One boy aged 16 lost 95 days from school in five acute attacks in the 1948-50 period, and only 18 days in two acute attacks in the 1950-2 period. It would seem that the condition tends to improve with advancing years.

Differential Diagnosis

In the 20 patients investigated a clinical "triad" of a history of recurrent joint pains, many target cells in the peripheral blood smear, and sickling of the erythrocytes has invariably been associated with signs of increased haemolysis in the peripheral blood. In my opinion three important conditions have to be considered in the differential diagnosis. These are acute rheumatic fever, a chronic haemolytic anaemia due to malaria, and so-called "Mediterranean anaemia."

The absence of sore throat, palpable nodules, or joint swellings, or evidence of valvular disease of the heart, with, in many instances, a normal sedimentation rate, eliminates the possibility that this condition is a rheumatic manifestation. In addition there was no response to salicylate therapy.

Malaria parasites were detected in the blood of only four patients and there was no haematological or symptomatic response to malaria therapy in any of the 20 patients. In addition, in five instances the spleen was not palpable and the history of recurrent attacks of joint pain given by these patients was striking, and was not simulated by any of the many hundreds of Africans examined and questioned—all of whom were developing or had developed premunition to malaria. From these facts it is felt that malaria can be excluded from the list of possible diagnoses.

It is difficult to exclude Cooley's anaemia, as, apart from the sickling of the erythrocytes, sickle-cell anaemia and Cooley's anaemia may present an almost identical blood picture in fixed films. Many patients showing target cells in peripheral blood smears were investigated, however, and in no instance was the syndrome described in these 20 patients found in the absence of the sickling phenomenon.

Discussion

If the homozygous theory of the inheritance of sickle-cell anaemia is correct, and if the incidence of the trait in the population of the Accra District of the Gold Coast is taken to be approximately in the region of 19%, by calculation the incidence of the anaemia should be 1%.

I examined 2,255 Africans and diagnosed sickle-cell anaemia in only one instance, giving an incidence of approximately 0.05%. This figure is, however, completely fallacious, as multiparous women, mothers at term, and newborn infants were included in the survey. It is most probable that the incidence of sickle-cell anaemia in mothers at term and in multiparous women is extremely low, as, excluding the mortality from the anaemia in the younger age groups, the primigravida may die suddenly before term in an acute sickle-cell crisis (Edington, 1951). It is also unlikely that the newborn child suffers from sickle-cell anaemia.

In addition, in the surveys the age groups most likely to exhibit the active disease (infancy and early childhood) were, unavoidably, not examined. It is perhaps significant that, in the group of 200 young schoolchildren examined, whose ages ranged from 8 to 12 years, one girl was found to be suffering from sickle-cell anaemia—an incidence of 0.5%. Although I have reviewed only 20 cases in this article, sickle-cell anaemia has now been diagnosed in 33 instances and the sickling phenomenon has been considered to be the cause of death at 13 necropsies (to be published). It can thus be stated that sickle-cell anaemia is not rare in the Accra District of the Gold Coast. It has not been possible to assess the incidence of sickle-cell anaemia, but

I consider that the calculated incidence of 1% may well be correct, which would agree with the homozygous theory of the inheritance of sickle-cell anaemia.

Summary

In the Accra District of the Gold Coast 2,255 Africans were examined for the presence of the sickle-cell trait and the anaemia. Sickling of the erythrocytes was present in 407 instances—an incidence of 18.1%. No ill effects were attributed to the presence of the trait in 406 Africans. The remaining African girl was suffering from sickle-cell anaemia.

The case reports of 20 patients suffering from sickle-cell anaemia are discussed. It was found that, in the Gold Coast, a history of recurrent attacks of pain in the larger joints and the presence of many target cells in the peripheral blood smear was invariably associated with sickling of the erythrocytes and signs of increased haemolysis in the peripheral blood. The importance of malaria as a "trigger" mechanism in initiating the crises of the anaemia is considered.

It is concluded that sickle-cell anaemia is not rare in the Accra District of the Gold Coast.

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THE HEALTH VISITOR AND THE FAMILY DOCTOR*

BY

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When I started collecting my thoughts for this paper I rather naturally began by considering the health visitor, but I was inevitably led to the realization that health-visiting work was only an aspect of the increasing service that is now expected from the general practitioner. No doctor who has been in practice over the last twenty-five years can have failed to realize that the conception of general practice has been, and is, changing; it will depend to a large extent upon the attitude of mind of the general practitioner himself if it is to be for the better. The medical profession, with the service it provides, is becoming increasingly important as a prop to the general weal of the nation; it must also be remembered that over the years we, as doctors, have been largely allowed to keep our own house in order. The number of Acts of Parliament regulating the profession of medicine has been very small. The first Acts I know of occurred in the time of Henry VIII† and simply said who could be allowed to practise medicine under certain conditions. The next Act was in 1858‡ and tightened up the controls, made more formal arrangements for entry into the profession, and provided, through the General Medical Council, for doctors who misbehaved to be taken off the list. Then we had the National Health Insurance Act of 1911, and the scope of this Act was much widened by the National Health Service Act of 1946. This last Act not only laid certain duties upon the doctor but by the comprehensive nature of the Act, and the associated obligations laid on the local authorities, increased the scope of the doctor's responsibilities.

There are, of course, other Acts which have affected doctors, and Parliament, through the Midwives Acts and the Nurses Acts, has provided assistants for him and arranged that they are adequately trained.

Although up to a century ago nurses were often disreputable, there has been little difficulty in their relationship with doctors: Florence Nightingale was more than a match for any man, even a doctor, and her influence remains.

It took a long time for the midwives and the doctors to settle down together; in the eighteenth century there were some very acrimonious discussions with midwives proper and the so-called "men midwives," who were beginning to make their presence felt. I cannot refrain from quoting William Smellie, about 1750, regarding the conduct proper to a midwife, for it is surely applicable,

*Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Cardiff, 1953.

†(a) The Physicians Act, 1540 (32, Hen. 8, C. 40).—The Act exempted members of the Fellowship of Physicians from having to undertake the duty of constable, and allowed physicians to practise medicine in all its branches. (b) The Herbalists Act, 1542.—In order to avoid "Sorceryes, witchecraftes and other inconveniencies, it was enacted that no p'son within the Citie of London, nor within seven myles of the same, shoulde take upon himself to exercyse and occupie as physician or surgeon, except he be first examyned approved and admitted by the Bisshopp of London," etc.

‡The Medical Act, 1858 (21 and 22 Vict. Cap. 90).

with obvious modifications, to the relationships between doctors and their other handmaidens:

"She ought to be a decent, sensible woman of a middle age, able to bear fatigue and well instructed in the elements of practical midwifery.

"She ought to live in friendship with other women of the same profession, contending with them in nothing but in knowledge, sobriety, diligence and patience; she ought to avoid all reflections upon men practitioners; and when she finds herself at a loss, candidly have recourse to their assistance—this confidence should be encouraged by the man who ought to rectify what is amiss without exposing her mistakes.

"These gentle methods will prevent that mutual calumny and abuse which too often prevails among the male and female practitioners, and will redound to the advantage of both, for no accoucheur is so perfect but that he may err sometimes."

One is now led to wonder why the health visitors—the other assistants—have been introduced into the medical scheme of things. As I have pointed out, the scope of medical practice has widened—almost entirely owing to the work of the profession. The family doctor now appreciates that the full therapeutics of a sick person includes the welfare of the patient's family. The cure of the actual ailment and the full economic and medical recovery of the patient are often associated with such matters as the patient's occupation, his housing, his financial position, his relationship with other members of his family, and other medico-social aspects of the case. If the general practitioner loses sight of these facts he is in danger of ceasing to be the family doctor.

General practice as I knew it thirty years ago was largely a matter of medicine and personality. A country practitioner for whom I worked was an outstanding man, and combined a good knowledge of medicine with the means of meeting many of the social responsibilities of ill-health in his patients. I am quite certain he would not be able to do it now. Personality and integrity are still as important, but medicine is not merely a matter of medical therapeutics—it must include social therapeutics.

The widening outlook has been obvious in the field of hospital practice, where the hospital practitioner is buttressed by an increasing army of auxiliaries—almoners, physiotherapists, dietitians, occupational therapists, and others. The same has been happening in general practice—for have we not there the children's officer, the probation officer, the N.S.P.C.C. officers, and others?—but in the subject of our talk we also have a key worker, one who can assist the practitioner to deal rationally with these other useful auxiliaries, and one who can also help the practitioner himself.

How the Health Visitor can Help the Doctor

I would therefore like to introduce to you the health visitor and let you know how I feel she can help you in your work. First of all, it is not always realized what a well-qualified and well-trained person she is. She must (1) be a fully trained registered nurse; and (2) have taken at least the first part of the midwifery certificate (as a matter of fact most health visitors are fully trained midwives and have worked as such); and (3) have passed an examination following a nine-months course in social medicine, including a knowledge of infant and child care, welfare work in relation to the disabled and the aged, maternal care; personal, domestic, and community hygiene, including household management; together with knowledge of social, industrial, and economic conditions and of the means of teaching.

I have analysed the qualifications of about 370 health visitors in some of our largest cities. Apart from the qualifications mentioned above, which they all possess, a number of them have also been trained and had experience in fever nursing, orthopaedics, housekeeping, tropical diseases, nursery nursing, the care of the tuberculous and mental cases—a few hold a higher qualification such as a tutor in public health training, the diploma in nursing, or are Queen's nurses. Taking gross populations, there appears to be about one health visitor per 9,000 of the population in these big cities. There will therefore be in this 9,000 about 130 births per annum, and about 500 children under school age; there will also be about 900 persons over the age of 65, a number of whom require some constant supervision. Apart from these there will be disabled persons, both young and old, problem families, and tuberculous patients. It is no light task helping to keep this mixed family under observation and to provide for them, but the health visitor's training equips her to do much for them, although I know only too well the magnitude of the task and the severe shortage of health visitors that exists.

The general practitioner will obviously want to know what assistance he can get from the health visitor. In a talk such as this I can only indicate the various fields where she can assist the doctor through her intimate knowledge of the family, or by invoking the assistance of other voluntary or statutory organizations. In many towns the health visitor is already carrying out the work I shall mention. I would like her to do this in a closer association with the family doctor. Before proceeding, I may remind you that the health visitor trained as a nurse is fully aware of her ethical obligations towards any patient she visits.

1. Care of the Mother and Child

This has been the primary function of the health visitor for over a hundred years when society in general was little concerned regarding the health and happiness of women and children. Although uninvited, and with no statutory right of admission to a home, the health visitor has been instrumental by her knowledge and perseverance in promoting the welfare of mother and child, and surely the husband also. The health visitor can assist the doctor in seeing that his advice on infant feeding and the care of premature children is followed, and in dealing with minor ailments and maladjustments. The continuing oversight of problem families, who cause such expense to the nation and such trouble to society, has been safely entrusted to her, although she would welcome some guidance and encouragement from the doctor.

The anxious mother welcomes the opportunity of discussing her difficulties with a knowledgeable person. These mothers ask questions and seek advice. How much better it would be if the health visitor knew that she was reinforcing the opinion of the family doctor. When emergencies occur—a mother is ill at home or has to leave a family to go to hospital—the health visitor can be left to do all she can to provide assistance. Then there is the preparation of the family for the return of a patient from hospital, sometimes imperfectly cured, needing special attention, diet, or care. Health visitors are encouraged to make direct contact with the hospital almoners so that there is a continuity of care.

Sometimes the aid of specialist agencies must be invoked—the children's officer, the probation officer, the N.S.P.C.C., and the doctor's time can often be saved by requesting the health visitor to make the necessary arrangements with these persons.

2. The Aged

Every general practitioner has a quota of persons who are old and, as a consequence, more frail and subject to disabilities, and more in need of friendly assistance, care, succour, and comfort. We are encouraging our health

visitors to keep these elderly people under supervision, report to the general practitioner when a special need arises, and ask for his assistance when a question of the disposal of these old people, either to an old persons' home or to a hospital, arises. The health visitor will, with his permission, call in a district nurse or suggest the need of a domestic help. Very often, in cases of inattention, arrangements can be made for the old person to be bathed, for the home to be cleansed, and for laundering the linen. The health visitor also frequently arranges for relatives to be informed of the condition of one of the elderly members of their families.

During the period of shortage of beds, either for the chronic sick or for the old people's home, the health visitors are asked for an assessment of the patient's "social" needs in assessing priorities for accommodation. I would much prefer that this was done with the assistance, or at the request, of the general practitioner, and, in fact, in my city it is an invariable practice for the general practitioner to be informed of the opinion of the health visitor regarding the disposal of such a case. Very often the health visitor is able to provide assistance to the elderly people by making their needs known to the Assistance Board or the Ministry of National Insurance, to invoke the assistance of voluntary agencies such as the "meals on wheels" service, or to arrange for assistance in shopping.

3. The Disabled and Handicapped

I very much doubt if a large number of general practitioners are aware of all the agencies that are willing and anxious to help disabled persons. Knowledge of these agencies can often lead to the provision of necessary help and comfort; not only that, but the local authority itself has an obligation to promote the welfare of the disabled, who include many aged persons. Special arrangements are also in force for caring for the mentally handicapped, both psychiatric cases and mental defectives. There are special visitors to provide for the particular needs of blind persons. As time goes on it will be possible to provide training in new work, occupational therapy, arrangements for the sale of goods made, for recreational facilities, for clubs, and so on. One of our big difficulties at the moment is to know the number and needs of persons in the different categories, for special facilities are often necessary to deal with special disabilities. The local authority would welcome information from the general practitioner, and much of the investigation of the case can, to begin with, be undertaken by the health visitor, especially if she has the co-operation of the doctor. The family health visitor is the general social worker; she will call for the specialist social worker—the psychiatric social worker, the probation officer, the home teacher for the blind, etc.—when necessary. With one key worker the number of visitors can be reduced.

In some cities, particularly in Cardiff, there are specialist health visitors dealing with certain types of aftercare. Specially trained health visitors visit diabetic cases, cases of gastric ulcer, and so on, in order to ensure that the regime prescribed at the hospital or by the doctor is being followed; but practice varies in different areas.

4. Tuberculosis

As our therapeutic advances begin to show a result it is likely that we shall have more cases of chronic tuberculosis on our hands, and not all of them can be contained in hospitals. The health visitor, working either as a specialist tuberculosis visitor or as the family-care worker, can see that the instructions of the general practitioner, the chest physician, or the medical officer of health, in relation to prevention are followed. She will see to it that the child is segregated where necessary, that contacts are shepherded to the chest clinic for investigation, and that extras, whether from statutory or voluntary agencies, and any special allowances which are necessary for the tuberculous patient himself, are

obtained and properly used. Tuberculosis is a chronic disease presenting a great variety of problems taxing the resources of the doctor and the local authority. Non-medical problems of finance, housing, and employment are frequent, and opportunities for discussion of a case with a social worker such as a health visitor must be very useful.

5. Accidents

As infection and other disease of childhood are becoming less prevalent it is surprising how accidents have emerged as a major cause of death and injury. Accidents in the home are very numerous. We are arranging for our health visitors to obtain as full information as possible about these, and to advise the mother how best to prevent recurrences.

Obligations of the Local Authority

I have pointed out the social and economic repercussions of sickness and the many agencies that are available to assist. The obligations of the local authority are very important: it must provide midwives, district nurses, home helps, and an ambulance service, and is encouraged to provide "care and aftercare"—a territory insufficiently explored but full of possibilities, both for the patient and for the doctor. A social worker like the health visitor can, with the doctor's assistance, make the needs known to the local authority.

A frequently heard complaint is that there are too many persons, representing well-intentioned and often necessary organizations, knocking at the door of the harassed housewife requiring information or offering assistance. I have counted over twenty such organizations in my own city. It is surely a waste of time for them to call indiscriminately. I would like to use the health visitor as a funnel, which, with the doctor's assistance, could be concerned with the economic deployment of these agencies. She could do this if she knew she was the accepted assistant of the doctor.

I have spoken of the health visitor in a city, but I know very well that in a country area, where the health visitor is also the district nurse and also the midwife, a close association has already evolved, and there is a good understanding between the doctor and her. It is not so easy in a town. The doctor may not know where to get hold of the health visitor, and hesitates to bother with officialdom in the town hall. We, as medical officers of health, are always ready to help, and would respond to any request from the doctor or the patient—and it often happens in this way—but I would much prefer that the contact was direct between general practitioner and health visitor. No general practitioner in Sheffield thinks of getting in touch with me when he wants the services of a district nurse or a midwife, and I am not particularly interested in supervising the day-to-day work of the health visitor.

It would save much trouble if the health visitor and doctor dealt direct with one another, either by telephone or in person, or that there was an arrangement for a regular transmission of information as required. No doctor thinks it necessary to provide his own midwife or district nurse; and, indeed, the State, appreciative of the value of these women, arranges to provide them and for the local authority to pay for them. The health visitor is in exactly the same position, and although the local authority engages her, supervises her, and deals with her terms of service, she is there for the good of the public, and in particular for the help that she can give to the general practitioner, who is primarily concerned with the care of the sick person and the welfare of his family.

Finally, although I have stressed the importance of the personal association between the doctor and the health visitor, I would like to say that this co-operation could be much better brought about if there was a closer association between the general practitioner and the medical officer of health and his medical staff. Both of us have our responsibilities to the patient, and we all have, I hope, the same desire to serve.

THE GENERAL PRACTITIONER AND THE HEALTH VISITOR*

BY

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During my 30 years in general practice I have had the advantage of a happy family partnership and the privilege of having practised medicine in an era which exemplified Mr. Churchill's dictum, given to a Royal College of Surgeons gathering, that the "longer we look back the further we can look forward," for we have seen more striking advances than could have been thought possible, among which must be counted the present liaison that is developing between those engaged in preventive medicine and general practitioners.

All my days the medical officer of health, owing allegiance to the local authority, has been respected as an administrator and regarded as an able colleague having specialized knowledge of infectious diseases, but whose duties in the main were no concern of ours. During my early years of practice, apart from social contacts, relationships between the work of the general practitioner and the medical officer of health were poor, and my then seniors in practice regarded welfare clinics as a form of subsidized competition which they disliked and mistrusted. In fact, in populous areas the work of the whole-time medical officer and that of the general practitioner were poles apart.

Let it be remembered, however, in arriving at a true conception of the picture, that the general practitioner was, in the main, a single-handed individualist, and obviously the time was not then ripe for the liaison we envisage to-day.

Nursing, the Keynote

The value of nursing has, to my mind, been paramount in the conduct of a practice, and I believe that nursing is the keynote to its success. I have had the advantage of having the same nursing sister with me for over a quarter of a century. At an early date I realized that her value was not just that of a nurse whose duties I understood and who officially carried out my treatment. The knowledge of the lives and habits of our patients which she gleaned and passed to me, and of the effect of their social problems on their illnesses, gave me an understanding which was invaluable in appreciating and treating their real difficulties—a knowledge which I had never encountered, or even considered, in my impersonal hospital life. It was she who revealed that a large proportion of patients who consulted us without physical signs, or who did not make progress, had financial, marital, or other family problems. It was she who comforted the pregnant single girl, and advised all patients, from the young mother to the aged sick, in those problems which were outside my clinical approach. She assisted in running our own infant clinic and became the confidant and friend of the parents, and, of course, of the children, who are now our second generation of patients. I suppose that, in the confines of one practice, this was the forerunner of social medicine and the liaison between doctor and health visitor as we are beginning to understand it to-day.

I am sure that all interested parties agree that the closest possible co-operation exists between the general practitioner and the nursing profession so far as the district nurse and the midwife are concerned. In my own area, with a popula-

*Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Cardiff, 1953.

tion of 120,000, the district nurses made over 60,000 visits last year. Without their co-operation and invaluable help a reasonable standard of efficiency in general practice could not be maintained in these busy days. In my first ten years in practice the "Gamp" still survived, and one had to fight hard to convince patients, even the intelligent ones, that trained nursing was essential to their safety. It is unthinkable that midwifery would be possible to-day without the closest co-operation between doctor and trained midwife.

Necessity for Liaison

It is with the public nurse—the health visitor—that lack of liaison is still so apparent, and some of the reasons become obvious when the problem is studied. Health visitors have always been the employees of the local authority, acting under the jurisdiction of the medical officer. They have worked in clinics, which, as we have said, were not looked upon with favour in the days of competitive practice, and they are a comparatively recent innovation, for it is only since 1919 that the health visitor has been recognized by the Government as an integral part of the social welfare structure. Study of their training syllabus and examination papers shows that primary qualification as a hospital-trained nurse and midwife is a requirement, followed by an intensive course of specialized nursing and social welfare; and this skill and competency has been kept, as it were, in the watertight compartment of the public health department. (In fact, many are actually unaware that a health visitor is primarily a trained nurse.)

The busy general practitioner, concerned with the treatment of minor ills and the diagnosis of major ones, cannot be pardoned for giving little time or thought to preventive medicine. This, he felt, was the sphere of others, and thus he never reaped the benefit of contact with that branch of the nursing—except, unfortunately, when advice given in the local authority clinic conflicted with his own and often created antagonism. If I may again speak from personal experience, it was in the field of tuberculosis that my colleagues and I first saw the real light of day in preventive medicine. In 1921 a physician was appointed by our local authority to take charge of this sphere who, if I may say so, was many years ahead of his time. He eliminated the concept of the tuberculosis dispensary and inaugurated a "chest clinic"—a title which to-day is finding favour everywhere. He pioneered extensive x-ray investigation, but he had, too, the foresight of social medicine, and encouraged all general practitioners to attend his clinics, and, to complete the liaison, brought them into contact with his enthusiastic sister in charge.

It was she who saw to it that she and her nurses were in touch with the patients, not just in the clinic but in their homes. She took a quite revolutionary step in making every possible contact—by telephone and personal visits—with the general practitioner, and it was she who gave us a vivid picture of how the social conditions of the home intensified the problems of the afflicted. The same sister still reigns, and with the recent enormous advances in the treatment of tuberculosis the liaison with the general practitioner, who now comes more than ever into the picture in this antibiotic era, has been firmly cemented. It is the welfare nurse who so impresses upon the patient that it is the family doctor who is to the forefront in this field. If I may digress, the value of that liaison has been exemplified in placing in suitable employment an ever-increasing number of tuberculous people who are fit to return to work; for there is contact via the chest clinic, the general practitioner, and the health visitor, so that details of the social environment, as well as the medical problems, are placed in the hands of the Ministry of Labour.

The 1946 Act, by opening the watertight compartments into which the care of the patient had gravitated, will ultimately revolutionize the practice of medicine and thus alter the whole conception of the broad issue of medical care. It was not until 1948 that the preventive sections of medi-

cine and the general practitioner began to work together in harmony, to the great benefit of the public.

The obvious key to this liaison is the health visitor, and the section of the Act which enlarged the duties of health visitors was in this respect visionary. I think we can prophesy that in the near future she will be regarded as invaluable as the district nurse in the conduct of modern practice.

What must be done, therefore, to accomplish this liaison? First, the general practitioner has to be satisfied—and many are not—that the work of the public health nurse is indispensable to him. When the doctor examines his records he will surely find, at a modest estimate, the great majority of his patients have been discovered, after hospital investigation, to be without physical signs of organic disease—perhaps a real justification for the general practitioner, for it is this majority who need his services and not that of specialism. When we come to analyse the matter, what do we find? The problems of the young mother, whose difficulties in infant feeding and whose natural anxieties due to inexperience cause her to need a good deal of comfort and advice, for which, although qualified to do so, the practitioner rarely has the time to give. We find, too, home problems which, undisclosed and unravelled, tend towards disharmony and discord, delinquency and mental ill-health, only too often reaching the psychiatrist, when they might have been dealt with much more effectively at an earlier stage.

Excursions into juvenile court magistracy gave food for thought when I recognized delinquent children and truants as cases which had been seen in the surgery and to whose problems I had neither a clue nor time to elucidate them. How often do those requests for a "tonic"—bromide and phenobarbitone sedatives—mask a state of affairs which the patient is unwilling to disclose to a busy doctor? Where active disease is concerned, only too often extensive measles and whooping-cough epidemics, a high incidence of tuberculosis, etc., are due to overcrowding and unsuitable home conditions. In such cases the health visitor would be invaluable in assisting in diagnosis and treatment—for example, she might find that immunization and vaccination had been postponed or neglected; might help the tired mother, often the subject of chronic ill-health and anxiety states, but responding quite satisfactorily to common-sense help and advice; might advise in the problem of the parent returning too soon to household duties or full employment following parturition or hospital treatment, by arranging necessary convalescence or home help. How many practitioners are aware, while recognizing that overcrowding is responsible for much mental and physical ill-health, that the rehousing of families by the local authority is often contingent on reports given by health visitors?

The Aged and Chronic Sick

It is my belief that much can be done for the aged and chronic sick by health-visitor liaison. The ventilation of this problem in Parliament and elsewhere has brought us face to face with the fact that the aged population is living longer and increasing numerically to an extent that may affect our whole social system. I found some excellent advice on this subject in a brochure issued by the Bristol Local Medical Committee. The 1946 Act, with its obliteration of the Poor Law hospital, however progressive it may have been, virtually cost, in my area, the use of 1,000 chronic-sick beds, and the general practitioner who prior to 1948 could easily lodge his chronic sick is now faced with a grave problem; for in spite of the excellent treatment afforded to a few in a geriatric unit, they cannot be accommodated in hospital. Also, the public has not yet been educated to this abrupt alteration, which has come to stay, and I feel sure that here the health visitor can do much by giving advice regarding hostels and by discussing with the family the problem that arises when the rest of the household are at work and unable to cope with the inevitable series of illnesses of old age, so rarely well

managed at home. The influence of a nurse, and her manner of approach, will do much to assist the aged who decide to maintain their sturdy independence by continuing to live at home; and by her contact with home helps, and often by tracing relatives, will be able to give invaluable service in this direction.

A Changing Phase

The changing phase of general practice, in which the practitioner will work in and with local authority services, will make the health visitor an essential factor, but the practitioner cannot assess the value of this ancillary service unless he has the means to study it; in effect he must have access in one way or another to local authority services. The Birmingham plan, published in the *Lancet* of April 5, 1952, is based on the assumption that general practitioners will work in local authority clinics. My visit to Birmingham was amply repaid by the courtesy and help afforded by the medical officer of health. (All good general-practitioner members of the B.M.A. should make pilgrimage to Birmingham, for it provides the vast majority of their leaders.) Birmingham regards the present services of local authorities as outmoded because they were inaugurated at a time when it was their duty to provide such services for those who could not afford them, and because the passing of the 1946 Act, which gives full facilities to the whole population, alters the entire position. The time is approaching when the general practitioner will, in the first instance, be the person responsible for the treatment of the family unit, and when the employment of junior staff by the medical officer of health's department for clinical duties will cease. The success of the scheme in Birmingham is obvious; Croydon, too, has an excellent liaison which enables the general practitioner to work in clinics if he so desires.

In my own area all clinics are open to practitioners, so that they may use the clinic or staff for ante-natal and post-natal care of patients, utilize the special services of the local authority such as physiotherapy for the pregnant mother, seek the help of the child guidance clinic, invoke the aid of the dental x-ray department, and have access to special departments for speech therapy, etc.; and this, combined with access to the chest clinic, gives great opportunities for further services to their patients. Thus practitioners will appreciate the value of the health visitor. Liaison of even the senior generation of doctors with the health visitors can be rapidly inaugurated by social contact, which will soon establish the happy relationship which always exists when doctor and nurse work together. But I feel it should be stressed that the practitioners must learn to regard the health visitor as an ancillary who has a highly specialized knowledge collateral with his own, not merely as a nurse acting under his official directions. So far as the younger generation of practitioners are concerned, they will come to regard health visitors as indispensable.

The student now sees them in the wards of hospitals, doing the rounds with him so as to assess the social after-care; but unless he meets them subsequently, the inestimable value of their knowledge is lost to him. Surely he will now enter practice, work when he so desires at adequately staffed clinics, and in the sphere of social medicine will have the advantage of calling upon the health visitor for the elucidation of his problem and of keeping contact, because he will meet her in the course of his work. His obstetric work will be immeasurably helped by meeting, through the offices of the health visitor, the midwife, either at the clinic or in his own surgery; and the present position will be improved, for only too often the general-practitioner obstetrician does perhaps two of the "antenatals" and the nurse the others—the two never meeting except in a possible emergency at a confinement.

Conclusion

Although enthusiastic about this subject, none of us would be so foolish as to suggest that health visitors are the complete solution to the many problems of practice, for history

teaches that enthusiasm is invariably followed by a stage of caution; but the most conservative would agree that in a large proportion of the cases which constitute our life's work and in which we need and would welcome assistance, this is waiting for us on our doorstep. May I say, too, that the use which is made, in certain areas, of open access to pathological services is so much less than was forecast that those in charge of administration in local authority need have no fear, in the first instance, that they would be overwhelmed by demands on their health-visitor services.

However, as the Minister said at Scarborough, it is the general practitioner who must captain the ship. It is not for him to evade his responsibilities but to increase them—because he has the necessary help. It is my belief that closer contact with the nursing profession must raise one's own standard; and I understand that, already, general practitioners who are working in clinics are becoming keen on postgraduate instruction that will keep them abreast of their subject when working side by side with health visitors.

So the doctor of the future, if he decides on general practice as a career, must realize that one of the most important factors in helping him to maintain personal contact with his patients, to understand their difficulties, and to guide those whose problems are not purely of disease but of social background, will be a firm liaison with the health visitor.

Finally, may I express my gratitude to the medical officer of health for East Ham, and his health visitors, past and present; for, without their invaluable help and co-operation and his advice to his authority to make liaison with general practitioners by offering the use of local authority services, this paper, however imperfect it may be, could never have been presented.

HYDROCORTONE AND SOFT-TISSUE LESIONS

BY

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The formation of painful scars in the moving parts of the body is a common cause of disablement. Non-specific inflammation of fibrous tissue follows injury or overuse and characterizes also the rheumatoid disorders.

Though there had been no satisfactory way of dealing with rheumatoid trouble, the problem of the painful scar due to trauma had been largely solved by the elaboration of manual methods. By means of deep massage in some cases, in others manipulation, it has proved possible to restore painless mobility, but it is usually a laborious business. For example, we have hitherto been quite satisfied with cure of tendinitis at the shoulder in say six or eight sessions, or tennis elbow in four to six sessions, since the breaking down of fibrous tissue in strong deep-seated tissue demand time and considerable ability and experience on the part of qualified personnel.

The fact of painful treatment, obtainable only from a minority of physiotherapists who have had special training in these techniques, naturally calls for constant exploration of alternative measures for dealing with

lesions of muscle, tendon, ligament, and joint-capsule. Fifteen years ago therapeutic local analgesia was extensively tried, but in the end we found it suited to only a few muscle lesions, to ligamentous injuries during the first day only of their occurrence, and, introduced epidurally, to some cases of low lumbar disk lesion. More recently we have experimented with short-wave diathermy and ultrasonic waves, and found they afforded no benefit in these disorders. When cortisone became available this was tried for its systemic anti-inflammatory effect, but it proved useless in non-rheumatoid conditions. However, hydrocortone, applied locally, has given excellent results.

Hydrocortone Acetate

This is supplied by Merck in 5-ml. phials containing in sterile suspension 125 mg. of the hormone. Hydrocortone has the same anti-inflammatory effect as cortisone, but exerts a local action. Hence it can be injected in small amount at infrequent intervals. It seems that no more need be injected than is required adequately to reach the whole affected tissue.

We were anxious to find out if hydrocortone could be used as effectively in traumatic as in rheumatoid inflammation. Since the reaction to aseptic injury is always excessive, we sought to control it by topical application of the hormone. We have found 25 mg. injected into the joint adequate for the shoulder, hip, and knee; 10 to 15 mg. for a tennis-elbow. After injury the cause of the inflammation is not, as in rheumatoid conditions, a continuing state; once the inflammation has been abolished there is nothing to reactivate it. Hence one or two injections suffice for those traumatic disorders in which hydrocortone is effective.

Since scarcity, expense, and possible toxicity with large doses all dictate that only small amounts of hydrocortone should be used, the importance of deciding on the exact site of the lesion is obvious. Hence the same system of diagnosis that originally enabled us to prescribe deep massage to one small point becomes more important than ever; for the 0.5 to 1 ml. of hydrocortone has to be injected into one precisely defined spot.

Diagnosis by Selective Tension

Tension brings on or aggravates pain in lesions of the moving parts. The approach is indirect and depends on assessment of function. Hence the diagnosis is arrived at by applying selective tension on each of the moving tissues in turn. From these responses a pattern emerges that identifies the precise tissue at fault. Search for tenderness is avoided so far as is possible, and, if it proves necessary, is confined to the structure already identified by this study of function as containing the lesion. When a number of movements are tested, some are found to be painful, weak, or limited, others normal. The negative side of the examination is as important as the positive, since, if one movement indicates that a lesion lies in a certain position, it follows that all movements that do not affect that part of that tissue must be of full range, painless, and strong. Hence interpretation is based on the pattern—that is, positive findings at one point balanced by negative findings elsewhere.

The main distinction when the moving parts are examined is between the contractile structures (muscle and tendon) and inert structures (capsule, ligament, bursa, dura mater, nerve-root, or nerve-trunk). Resisted contraction applies strong tension on muscle and tendon; stretching in the opposite direction may hurt too. Pain arising from inert structures appears on stretching only.

Examination of Function

Five different sets of data are correlated, as follows:

1. *Active Movements*.—These give a combined indication of the range of movement, muscle power, and state of volun-

tary control. Since range and power are assessed separately later, their chief virtue is to indicate willingness. Marked discrepancy between the range of active movement on the one hand and, on the other, the range of movement and muscular strength indicates psychogenic disorder.

2. *Passive Movements*.—These indicate the state of the inert structures without introducing complications due to muscle power and willingness. *Capsular pattern*.—If the entire fibrous cuff about any joint is found contracted, arthritis is present. The limitation of movement found corresponds to the capsular pattern. This is different for different joints, but maintains constant proportions at any one joint. For example, in arthritis at the shoulder, if abduction is, say, 45 degrees limited, lateral rotation will be 60 degrees limited but medial rotation only 15 degrees limited. *Non-capsular pattern*.—If the known proportions are not found, ligamentous sprain, internal derangement, bursitis, neoplasm, contracture of an extra-articular structure, or hysteria is present.

3. *Resisted Movements*.—One movement is tested for each group of muscles, and such a degree of resistance is applied that the joint itself does not move. The state of the muscles is thus assessed in isolation. If a full range of movement exists and only one resisted movement hurts, a muscle lesion is present. If several contradictory restricted resisted movements hurt, the muscles are unaffected. Painless muscle weakness without increase of pain characterizes complete rupture or a neurological condition.

4. *Painful Arc*.—If a tender structure lies between two bony surfaces it can be painfully squeezed when they are approximated. A painful arc results—that is, pain at mid-range of a movement disappears as the extremes are approached. For example, in supraspinatus and infraspinatus tendinitis, and in subdeltoid bursitis, the lesion lies between the acromion and the greater tuberosity of the humerus. Therefore, tenderness of any of these three structures may give rise to a painful arc. In the case of the tendons, the arc is associated with pain on resisted abduction and lateral rotation respectively. If the bursa is at fault neither resisted movement hurts. Since the simplest anatomical considerations indicate clearly where the tissue, since it is pinchable, must lie, an arc is a valuable localizing sign.

5. *Palpation*.—This may reveal warmth; if so, the finding indicates an active lesion. It occurs with recent injury or operation, fracture, internal derangement, neoplasm eroding bone, blood in the joint, rheumatoid or gouty arthritis, and bacterial infection. Fluctuation indicates fluid. Synovial thickening, crepitus, loose bodies, cysts, osteophytes, and bony enlargement are detectable. Tenderness serves to indicate the exact site of a lesion only if palpation is confined to the tissue already singled out by study of the diagnostic movements as that affected.

6. *Confirmation*.—Radiography seldom clarifies a diagnosis in lesions of the soft tissues and may prove most misleading; hence the paramount importance of the clinical assessment of function. Local analgesia provides the only means of disproving or confirming a localization arrived at clinically, and in all cases of doubt should be induced at once. After the injection whatever movement had been found painful is tested again. If the right spot has been reached this movement remains painless for one to two hours. Once the right spot has been found—if necessary by repeated small infiltrations—the hydrocortone can be injected the next day.

Choice of Cases

Most soft-tissue lesions of the moving parts respond rapidly to the standard methods used in orthopaedic medicine—deep massage, manipulation, traction, and therapeutic local analgesia (Cyriax, 1950). Thus we have selected for treatment by hydrocortone patients who either had failed to respond to our normal procedures or lived too far away to attend for such treatment.

Technique

Intra-articular injection presents little difficulty except at the shoulder. At the smaller joints, traction is useful to form a gap into which the needle can pass.

Shoulder.—The patient lies prone, the forearm on the affected side under his abdomen. However arthritic a shoulder-joint, this position is not painful; and it secures fixation of the humerus in slight medial rotation. The operator identifies the posterior bony projection lying at the point where the acromion and the spine of the scapula meet at right angles. He selects a spot 1 cm. below this point and thrusts in a thin needle 5 cm. long. He identifies the coracoid process anteriorly and aims the needle directly at it. He feels nothing as the needle traverses the fleshy infraspinatus, but the capsule of the joint offers clear resistance. Once the capsule of the joint is pierced the needle becomes embedded in articular cartilage—another characteristic sensation, quite unlike the impenetrable surface offered by bone. If the operator wishes to be doubly sure that the needle lies intra-articularly, he can pierce the capsule in several adjacent spots until resistance to the needle suddenly ceases and it passes easily to its full length between humerus and glenoid. 25 mg. of hydrocortone (1 ml.) is now injected.

Results

Shoulder.—Between us we have treated 21 cases, as follows: freezing arthritis, 9; infective arthritis, 6; post-traumatic capsulitis, 3; post-operative adhesions, 1; immobilizational capsulitis, 3; subscapular tendinitis, 1. The hope that an effective treatment had at last been found for freezing arthritis was again disappointed. The results were largely negative, and in several patients seen when the arthritis was in the early part of the first stage the disorder was uninfluenced, and progressed in the usual way towards increasing pain and limitation of movement. In one case no less than 125 mg. of hydrocortone was injected in the course of a month without effect. By contrast, the six patients with infective arthritis reported immediate relief. The constant pain ceased by the same evening, and the patients were able to lie on that side at night for the first time for months. The range increased, and so far (maximum seven months later) there has been no return of symptoms.

In the cases following trauma and immobilization the results were generally good and patients with lesions in the active stage (that is, unsuited to the physiotherapist's repeated gradual stretching) were brought within a fortnight to the point where this could be undertaken with success. Months of disablement were thus avoided. In the post-operative case (stiffness following operation for recurrent dislocation) no benefit resulted. The patient with subscapular tendinitis responded well. He had had two months' pain, and six days after injection of 1 ml. of hydrocortone had lost his symptoms; these have not returned.

Tennis and Golfer's Elbow.—These cases number 14: teno-periosteal tennis elbow, 9; tendinous tennis elbow, 3; golfer's elbow, 2. These disorders provided our most consistently spectacular results. We confined our treatment by hydrocortone to cases in which the lesion lay at the teno-periosteal junction or in the body of the common extensor tendon itself. Only 0.5 ml. of the suspension was used. Ten days after the injection 10 patients were playing tennis again painlessly. In the two remaining cases relief was incomplete, but cure followed a second injection. Two cases of golfer's elbow (strain of the common flexor tendon at the medial condyle) were fully relieved by one and two injections respectively. As a precaution (possibly unnecessary) patients were asked not to exert the wrist during the first few days after the injection, so as to give the anti-inflammatory action of the hormone a favourable environment for its action.

Knee.—Infective arthritis, 2 cases; sprained coronary ligament, 1 case. Infective arthritis of the knee had been present for two months in a woman of 26 years. After the

injection the heat, fluid, and synovial swelling almost disappeared for a week, and then returned rather more so than originally. By contrast, three fortnightly injections of 1 ml. suspension into a hot, swollen, painful knee of two years' standing had an excellent result, which has now lasted two months. The coronary sprain was of two months' standing. The ligament was infiltrated with 0.5 ml. of the suspension. Within a few days the symptoms ceased, but a small effusion remained. This was abolished by 1 ml. injected intra-articularly.

Miscellaneous.—One case of sprain of the deep aspect of the acromio-clavicular joint responded very well to two infiltrations; in another case it had no effect. A dancer who had been unable to dance for two months because of a sprained toe-joint was symptom-free after two injections. A tenosynovitis of the flexor carpi radialis which had responded indifferently to deep massage was cured by two infiltrations.

Other Uses.—Quite possibly, hydrocortone will have an important part to play in orthopaedic surgery. Introduced into the knee-joint after—for example, meniscectomy—it should serve to abort the traumatic arthritis and thus shorten convalescence materially. It may prove the treatment of choice in traumatic arthritis at the elbow-joint. Medical uses may include injection into the pleura and pericardium, and perhaps spraying the nasal mucosa in allergic conditions.

Conclusions

Hydrocortone exerts a strong anti-inflammatory action when in contact with fibrous tissue. Lesions of tendon, ligament, and joint-capsule caused by injury or overuse can apparently be cured outright within a week or two. Naturally, the smaller the area of tissue affected the more thoroughly it can be infiltrated. Precise diagnosis by means of the method of selective tension described is therefore an essential preliminary.

Tennis elbow and other tendinous disorders respond particularly well. However, another failure must be recorded in the apparently endless search for the effective treatment for freezing arthritis at the shoulder.

The indications for deep massage by the physiotherapist are narrowed, but those for manipulation remain unaltered.

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Since the Scientific Film Association's *Catalogue of Medical Films* was published in 1952, many more films on medical and allied subjects have been brought to the association's notice, and details of these have been compiled and published as a supplement (Harvey and Blythe, London, price 6s.). Information about some 260 films is given in the supplement, and with the main catalogue short descriptive notes on over 1,200 medical films are now provided. The supplement is intended for use with the 1952 catalogue, in which abbreviations are interpreted and distributors listed. The films cover many aspects of medicine. Most of them have been made in Britain, but some films from the United States of America, Canada, New Zealand, and Russia are also listed. The new films include three on accident prevention, fifteen on health education and health services, several of which are especially suitable for showing to children, and eight on rehabilitation. There are more than twenty on general and specialist surgical subjects, ten on anatomy, several on diseases of the ear, nose, and throat; a large selection on gynaecology and obstetrics, paediatrics, industrial medicine, personal hygiene, and nursing. There are also films on neurology, orthopaedics, pharmacology, psychology and psychiatry, and anaesthetics, and a number on veterinary science.

TECHNIQUE AND VALUE OF
AORTOGRAPHYREPORT OF A CASE OF EXTERNAL ILIAC
ARTERIAL GRAFT

BY

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Although aortography was introduced by Dos Santos *et al.* in 1929, it has never been a popular form of investigation in this country, and it is still considered by many to be a difficult and hazardous procedure of no clinical value. Recent developments in vascular surgery, however, have made aortography an absolutely essential investigation in certain cases. It is, in fact, neither difficult nor hazardous, and can be performed under sedation alone. The use of general or high spinal anaesthesia is unnecessary.

Technique

The patient is brought to the x-ray room having had, one hour before, "omnupon," $\frac{1}{2}$ gr. (22 mg.), and scopolamine, 1/150 gr. (0.43 mg.). In the x-ray room he is given a test dose of 1 ml. of 70% diodone. This is an important precaution, as, although toxic manifestations are rare, an occasional severe reaction will be encountered. The patient is placed on the x-ray table in the prone position and a marker is fixed opposite the spinous process which is judged to be correct. If aortography is being performed to show the iliac vessels the injection is made opposite the third lumbar vertebra. If it is desired to display the renal vessels the injection must be made opposite the first lumbar vertebra or opposite the twelfth dorsal vertebra, to show the coeliac axis and its branches.

A preliminary film is taken. This is viewed and the position of the marker checked before the injection is given. Before proceeding with the injection a dose of intravenous pethidine is administered. This is a most important part in the technique, as it obviates the use of spinal or general anaesthesia. In an average case 100 mg. gives good sedation, but sometimes less is sufficient. A small intradermal weal is raised with 2% lignocaine hydrochloride opposite

the selected vertebral spine and 4 to 4½ in. (10 to 11.4 cm.) from the midline. The needle is of s.w.g. 16 and 7 in. (18 cm.) in length. It is inserted through the weal and directed towards the vertebral body. If the latter is struck the needle is redirected to pass in front of it. The aorta is easily punctured and at once a strong pulsating flow of blood comes from the needle. It is important to advance the needle a few more millimetres before giving the injection. The needle is connected to the syringe filled with 30 ml. of 70% diodone by an intervening length of about 12 in. (30 cm.) of pressure tubing. In this way the surgeon making the injection stands well clear of the beam of x rays. The needle itself is firmly held in 5 in. (12.5 cm.) of soft tissue, and it is unnecessary for the surgeon to steady it with a hand, thereby exposing himself to x rays. The injection is given as rapidly as possible and the film exposed as the last few millilitres are going in. If the injection is to be

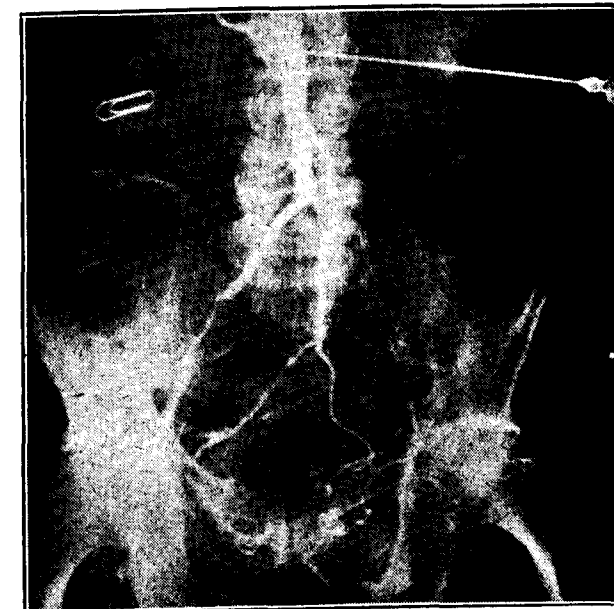


FIG. 2.—Case 3. Extensive atheroma and thrombosis.

made at the level of D 12 or L 1 it is necessary to direct the needle obliquely upwards, as the twelfth rib prevents its insertion opposite the first lumbar vertebra.

We have not encountered any serious ill effect using this technique. On two occasions the needle has been satisfactorily placed at the beginning of the injection but has come out before the injection was completed and a periaortic deposit of dye has been made. This occasions some pain in the back, which passes off readily as the dye is absorbed. Two patients with acute embolic occlusion of the aorta have died within 48 hours of aortography. In each case the site of the needle puncture was difficult to find at necropsy, and no extravasation of blood was seen.

Indications and Results

There are many occasions in which aortography may give extra help in the elucidation of a pathological process, and because it is simple to perform we have used it on a variety of clinical problems. Its greatest value is that it can be used to define exactly the site and extent of a block in the aorta or iliac arteries, the result of embolus or thrombosis.

We have not had a patient with aortic embolus admitted early enough to get a recovery, but the following two examples will illustrate the value of aortography in these cases.

Case 1.—A man aged 56 had complained of anigral pain for five years, but there was no clear history of a recent coronary occlusion. Four weeks before admission he had a sudden loss of power in both legs which lasted only 10 minutes. Two weeks later he went to bed after a sudden attack



FIG. 1.—Case 2. Aortic embolus.

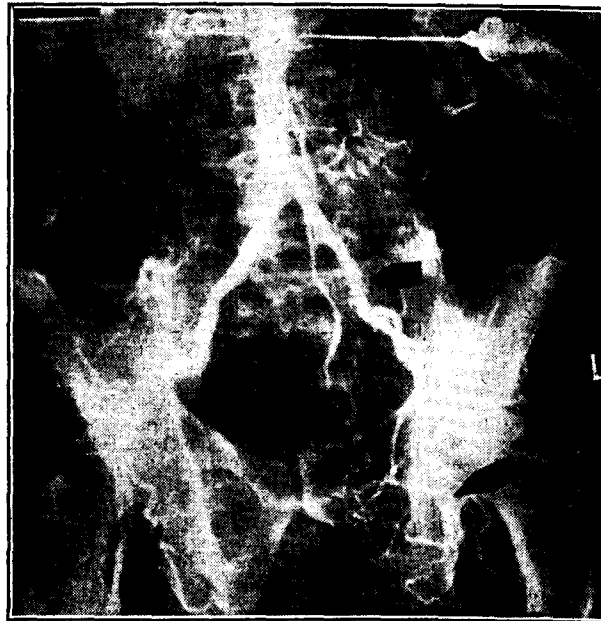


FIG. 3.—Case 4. Arrows indicate extent of block in external iliac artery.

of pain in the left calf and a cold foot. He was treated with tolazoline hydrochloride and improved somewhat. Thirty-six hours before admission he developed severe pain in both legs and within six to eight hours sensation was gone. A clinical diagnosis of embolus at the aortic bifurcation was made, but operation was considered inadvisable as the condition had been present for so long. Aortography confirmed the diagnosis and indicated the exact sites of obstruction. These were at the origin of the left common iliac and in the right external iliac. Necropsy confirmed the clinical diagnosis.

Case 2.—A woman aged 42 was known to have had auricular fibrillation and mitral stenosis for some years. She was admitted with a 30-hours history of loss of power and sensation in both legs. The lower limbs were mottled and cold and pulsations were absent. A clinical diagnosis of aortic embolus was made and an aortogram taken (Fig. 1). It was evident that the aorta was blocked at the level of the second lumbar vertebra. In view of the lateness of the condition no treatment was attempted and she died 24 hours later. Necropsy confirmed the site of the block.

It is in the locating of arterial thrombosis above the femoral artery that we have found aortography of greatest practical value. Such an obstruction may give rise to gangrene of the toes or to claudication in the calf, thigh, or buttock. The possibility that these symptoms may be relieved by endarterectomy or by arterial graft makes accurate visualization of the great vessels imperative. In many cases the disease will be shown to be diffuse and probably unsuitable for surgery, as in Case 3.

Case 3.—A man aged 59 was admitted with incipient gangrene of the toes of the right foot. The left leg had been amputated in 1948 for gangrene. Aortography (Fig. 2) showed that the left common iliac artery was obstructed at its origin, and that there was considerable narrowing of the proximal half of the right external iliac artery. The femoral artery is also obstructed just below the profunda femoris branch. The circulation to the legs is largely being maintained by anastomotic branches from the inferior mesenteric.

In Case 4, however, it was possible to excise and graft a thrombosed external iliac artery.

Case 4.—A man aged 64 had severe calf and thigh claudication of one year's duration. He had pain as soon as he took a first step and had to stop after 50 yards. There were no pulses in the left leg. Aortography (Fig. 3) showed this to be due to an obstruction of the whole of the external iliac



FIG. 4.—Case 4. Aortogram taken three months after graft to external iliac artery.

artery. The artery was exposed extraperitoneally on August 19, 1952, by one of us (R. E. H.). The great vessels were very atheromatous and the external iliac had no pulsation. The affected artery was dissected free, and after application of clamps to the common and internal iliac arteries trial section of the external iliac was begun. It was found to be blocked at its origin and had to be cut from the common iliac, leaving a window in the latter. In sectioning the lower end of the block a small arterial flow was found in the recanalized mural thrombus, but a clear artery was not found until about 1 cm. above the profunda branch of the femoral. A graft consisting of the aorta of a 4-year-old child was inserted by a continuous evert suture. The posterior tibial pulse did not become palpable until some six hours later, when it soon became strong. The patient was seen on November 1, nearly three months after the operation, and had no claudication, and said he could walk anywhere. The pulses are all present in the leg and are of

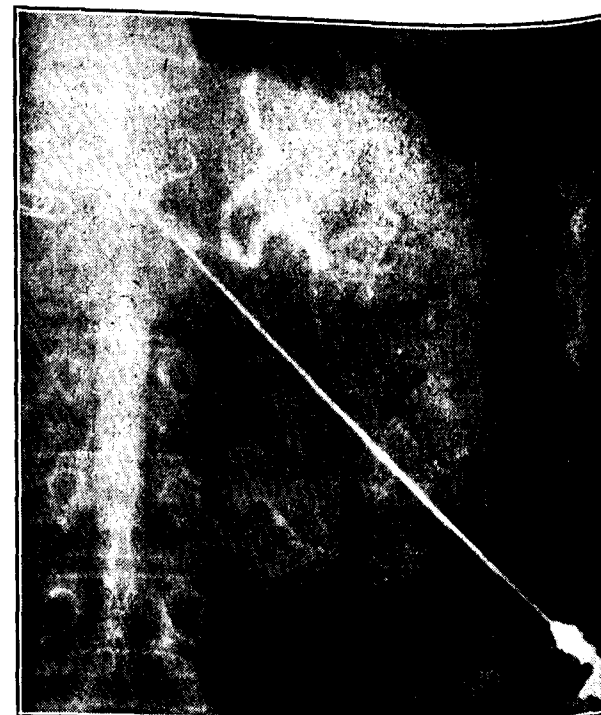


FIG. 5.—Enlarged spleen demonstrated by aortography. Arrow indicates artery to lower pole of spleen.

good volume. The post-operative aortogram (Fig. 4) shows the graft in position and of normal calibre. There was an excellent flow of blood in the femoral arteries. In October, 1953, 14 months after his operation, he was still getting an excellent functional result and all the peripheral pulses were present.

In addition to its outstanding value in the two types of case which have been described, aortography has occasional value in other circumstances.

In one patient a lump in the left hypochondrium was particularly difficult to feel because of the build of the patient. Serious doubt existed whether the lump was an enlarged kidney or spleen. Aortography clearly demonstrated that it was an enlarged spleen (Fig. 5), for the renal outline was clearly seen and the splenic arteries spread far beyond the confines of a normal spleen. Thus, in general terms, aortography may be of value in diagnosing a doubtful abdominal tumour. It may be of value in locating the site of a suprarenal tumour in a case of Cushing's disease, but we have not yet had the opportunity of testing this. Goodwin *et al.* (1950) record its use in such a case.

Aortography has been added to the more orthodox methods of pyelography in the investigation of kidney disease, as has been fully described by Griffiths (1950). It is claimed that the pooling of dye which occurs in a hypernephroma will distinguish it from a solitary cyst, but we feel that in the absence of such an appearance it would be dangerous to make a definite diagnosis of renal cyst and not submit the patient to an exploratory operation.

Summary

The technique of aortography under sedation without anaesthesia is described and its value is illustrated.

A case in which an external iliac arterial obstruction was accurately located by aortography is reported. The artery was excised and replaced by an arterial graft, with a satisfactory result three months after the operation.

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It is estimated that at the present time out of every 100 average men and women in Great Britain only 2 have naturally perfect teeth; 16 need teeth extracted, 42 require other dental attention, and 40 have complete or partial dentures. These statistics appear in an article contributed to *Progress* by Sir William Kelsey Fry. "Dental disease is one of the consequences of civilization," he says. From examining large numbers of skulls, research workers now know that in the Middle Ages quite half the population had no carious teeth. But by fifty years ago it was unusual to see a patient with a healthy mouth; and during the 1914-18 war large numbers of men were rejected as unfit for active service on account of the state of their teeth. During the last war it was estimated that at 18 years of age 98% of the men and 90% of the women were in need of dental treatment. However, Britain has by no means the worst teeth in the world: some parts of the United States and Norway, Australia, and New Zealand have a much higher caries rate. The incidence of caries in Europe declined in both world wars, and the conclusion is drawn that this was closely linked with the reduction in sugar consumption and changes in bread texture. Nowadays dentists find themselves unable to keep pace with the alarming increase in dental disease. In England and Wales there are 10,000 practising dentists, the majority of whom are over 50 years of age. That means that one dentist is expected to keep between 3,000 and 4,000 people dentally fit.

VALUE OF SINGLE-SAMPLE TEST IN DIFFERENTIAL DIAGNOSIS OF JAUNDICE

BY

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In the differential diagnosis of jaundice, although biochemical tests cannot take precedence over clinical findings, cases occur in which the clinical features are puzzling. For example, chronic hepatitis may in some cases present as painless jaundice simulating obstruction arising from a carcinoma of the head of the pancreas; while in other cases the main complaint may be of pain similar to that of biliary colic. In cases where the clinical picture is problematical, biochemical tests, by suggesting an earlier solution, can be of value, the importance of an early diagnosis being the necessity to decide whether surgical intervention is indicated. On the one hand, the dangers of an unnecessary exploratory operation in a case of hepatogenous jaundice must be avoided, and, on the other, the patient must be guarded from the harmful effects of prolonged extrahepatic obstruction.

The "single-sample tests" have the advantages of simplicity in obtaining the specimen with minimal discomfort to the patient, along with economy in time to the patient and the physician. Coleman (1950) has shown that such tests are reliable, irrespective of the stage of the illness. However, many such single-sample tests recommended (for example, by Schwimmer *et al.*, 1945; Shay and Siple, 1948; Mawson, 1948; Popper and Steigmann, 1948; and Hoffbauer *et al.*, 1949) involve an imposing number of biochemical determinations, employing a wide range of tests. Bearing in mind that this is a clinical problem as distinct from interesting research, the simpler tests, which can be carried out in any hospital laboratory, must be given prior consideration.

The object of the present investigation was to find out the minimal number of determinations that should be included in a single-sample test to make this of value in differentiating obstructive from hepatogenous jaundice. It is generally agreed that none of the tests employed will estimate the degree of liver damage, and this aspect of the problem is therefore not touched upon. Likewise, no attempt has been made to assess the prognostic significance, if any, of these tests.

Material and Methods

Material.—The present series consisted of 104 patients who showed signs of jaundice and whose records contained sufficient data to establish an undoubted diagnosis. This series was composed of the following:

Obstructive jaundice (67 cases)	
1. Carcinoma obstructing extrahepatic bile ducts ..	27
2. Calculus in the common bile duct ..	17
3. Chronic pancreatitis ..	4
4. Stricture of common bile duct ..	2
5. Carcinomatosis involving liver ..	17
Hepatogenous jaundice (37 cases)	
6. Cirrhosis of liver ..	20
7. Acute hepatitis ..	11
8. Miscellaneous cases of hepatogenous jaundice ..	6

Those grouped in "carcinomatosis involving liver" were patients in whom neoplastic metastases invading the liver

were demonstrated either clinically, at operation, or at necropsy, but where no definite extrahepatic biliary obstruction was found. The justification for including such cases among the obstructive groups was that Himsworth (1950) considered that the jaundice in such cases was due to pressure by deposits of growth upon the biliary passages. In the other obstructive groups the diagnosis of obstruction was based on operation or necropsy findings in all but two cases.

As might be expected, in the hepatogenous groups most of the diagnoses were based on clinical findings and progress. Cases in which there was doubt about the diagnosis were excluded from the series. Cases of haemolytic jaundice were also excluded, as this condition rarely presents a problem in the differential diagnosis of jaundice.

Methods.—The tests employed were serum alkaline phosphatase activity (King and Armstrong, 1934); serum total cholesterol (Bloor method as modified by Kenny, 1952); plasma protein; and thymol turbidity (Maclagan, 1944b). These determinations were carried out on a single sample of 20 ml. of venous blood divided into 10 ml. each of clotted and oxalated blood. At the same time a sample of urine was examined for urobilinogen and urobilin.

Results

The individual findings in the 104 patients are not detailed here, but the result of each determination in the patient's initial single-sample test has been classified as indicating obstructive or hepatogenous jaundice according to the criteria in Table I.

TABLE I.—Critical Levels

Test	Obstructive Jaundice	Hepatogenous Jaundice	Reference
Serum alkaline phosphatase	Over 35 units	Under 35 units	Maclagan (1944a)
Serum total cholesterol	Over 300 mg./100 ml.	Under 300 mg./100 ml.	Epstein and Greenspan (1936)
Plasma albumin	Over 3.4 g./100 ml.	Under 3.4 g./100 ml.	Gray (1950)
Plasma globulin	Under 2.9 g./100 ml.	Over 2.9 g./100 ml.	Gray (1950)
Thymol turbidity	Under 4 units	Over 4 units	Maclagan (1944b)
Urobilinogen and urobilin	Not increased	Increased	Watson (1937)

Analysis of the separate tests yielded the results summarized in Table II. The left column under each test contains the number of determinations in each group of patients suggesting an obstructive cause for the jaundice, the numbers in the right column being the determinations suggesting a hepatogenous lesion.

Serum Alkaline Phosphatase.—This was most often raised above the critical level in cases of obstruction due to carcinoma or to metastatic deposits (groups 1 and 5); but even where obstruction rose from other sources it was raised in 16 out of 23 cases (70%). In the present series, however, it was also raised in 10 out of 37 cases (27%) of hepatogenous jaundice. Using 35 units as the differential level, this test by itself would have suggested the cause of the

jaundice in 80 out of 104 cases, but would have been misleading in 24 cases. In no case of obstructive jaundice, no matter how mild, was the serum alkaline phosphatase below 20 units.

Serum Total Cholesterol.—In contrast to the above, hypercholesterolaemia was present most frequently where obstruction was due to causes other than malignant neoplasm. It failed to appear in more than half of the cases of obstruction where neoplasm was present, but in many of these cases cachexia, which tends to lower the blood cholesterol, was evident. Although positive in obstructive jaundice less often than the serum alkaline phosphatase, it was misleadingly raised in only three cases of hepatogenous jaundice. The results in Table II show that absence of hypercholesterolaemia need not indicate the absence of obstruction, but where hypercholesterolaemia is present obstruction is probable. Using hypercholesterolaemia as an indication of obstruction, and disregarding a serum total cholesterol of under 300 mg. per 100 ml. as of no differentiating value, this test would have diagnosed correctly only 35 out of 66 cases (53%) of obstructive jaundice, but would have been misleading in only 3 out of 35 cases (9%) of hepatogenous jaundice.

Plasma Albumin.—Hypo-albuminaemia was present in 40% of the cases of hepatogenous jaundice, but was also present in 41% of the obstructive cases. This test was obviously of no differentiating value in the present series.

Plasma Globulin.—Hyperglobulinaemia was present in 81% of the cases of hepatogenous jaundice, but was present also in 81% of the obstructive cases. This test also was obviously of no differentiating value.

Thymol Turbidity Test.—In hepatogenous jaundice this test was more often within normal limits than raised. A normal thymol turbidity is therefore no indication of the absence of liver-cell damage. When abnormally raised, however, it indicated correctly the nature of the jaundice in 16 out of 37 cases (43%) of hepatogenous jaundice, and was misleading in only 7 out of 67 cases (9%) of obstructive jaundice. In obstructive jaundice the level of 9 units was never exceeded in the present series.

Urinary Urobilinogen and Urobilin.—The anticipated absence of urobilinogen and/or urobilin from the urine in cases of obstructive jaundice was shown in 42 out of 62 cases (66%), while in hepatogenous jaundice only 8 out of 36 cases (22%) failed to show either in increased amounts.

Discussion

Serum Alkaline Phosphatase

Although its mechanism is still not clearly understood, this test has repeatedly proved its value since its use in the differential diagnosis of jaundice was described by Roberts (1930, 1933). In the present series there was a similar degree of overlap at the usual differentiating point at 35 units to that reported by Giordano *et al.* (1939), Gutman *et al.* (1940), Higgins *et al.* (1944), and Maclagan (1944a).

The present observation that the rise in serum alkaline phosphatase is most pronounced in the presence of malignant neoplasm has also been noted by Higgins *et al.* (1944),

TABLE II.—Analysis of Results

Group	No. Cases	Serum Alkaline Phosphatase		Serum Total Cholesterol		Plasma Albumin		Plasma Globulin		Thymol Turbidity		Urobilin and/or Urobilinogen	
		35+	35-	300+	300-	3.4+	3.4-	2.9-	2.9+	4-	4+	-	+
1. Carcinoma obstructing ducts	27	22	5	14	13	14	13	5	22	26	1	20	6
2. Calculus in common bile duct	17	11	6	12	5	11	5	1	15	16	1	10	7
3. Chronic pancreatitis	4	3	1	3	1	3	1	1	3	4	—	3	—
4. Stricture of common bile duct	2	2	—	—	2	2	—	1	1	1	1	—	—
5. Carcinomatosis involving liver	17	15	2	6	10	8	8	4	12	13	4	9	5
Total obstructive	67	53	14	35	31	38	27	12	53	60	7	42	20
6. Cirrhosis of liver	20	8	12	2	17	10	10	2	18	11	9	4	16
7. Acute hepatitis	11	2	9	1	10	9	2	4	7	5	6	4	7
8. Miscellaneous hepatogenous	6	—	6	—	5	3	3	1	5	5	1	—	5
Total hepatogenous	37	10	27	3	32	22	15	7	30	21	16	8	28

Schwimmer *et al.* (1945), and Hoffbauer *et al.* (1949). This observation cannot be explained. Cleveland *et al.* (1950) found no detectable phosphatase activity in neoplastic cells in the liver.

In the present series none of the 67 cases of obstructive jaundice showed a serum alkaline phosphatase below 20 units, irrespective of the duration or degree of jaundice. Maclagan (1944a) reported only 3 out of 43 cases of obstructive jaundice as falling below 24 units. It would therefore appear that a serum alkaline phosphatase of under 20 units, in the presence of jaundice, strongly indicates a non-obstructive cause.

Concurrent serum bilirubin determinations with the serum alkaline phosphatase results reported in this paper showed that there was no tendency towards inverse relation with the height of the serum bilirubin in the two groups of jaundice. This is in keeping with the findings of Flood *et al.* (1937), Sherlock (1946), and Mawson (1948). Therefore interpretation of the serum alkaline phosphatase determination should not be influenced by the serum bilirubin level.

Serum Total Cholesterol

The value of this test has been doubted in the past. Sherlock (1946) regarded it as of no value, but her limits for hypercholesterolaemia were low. Hoffbauer *et al.* (1949), using 225 mg. per 100 ml. as the differentiating level, were also not impressed by this test. When, however, their figures are reviewed using 300 mg. per 100 ml. as the point of hypercholesterolaemia it can be seen that only 6 out of their 57 cases (10.5%) of hepatogenous jaundice showed hypercholesterolaemia. This value of 300 mg. per 100 ml. was the level above which Epstein and Greenspan (1936) considered significant hypercholesterolaemia to be present. They found that this level was exceeded by 78% of their cases of obstructive jaundice, while only 10% of their cases of hepatogenous jaundice showed hypercholesterolaemia. The comparable figures in the present series were 53% and 9% respectively. Cantarow and Nelson (1937) recorded that 11 of 28 cases (40%) of obstructive jaundice exceeded 300 mg. per 100 ml., while none of their 22 cases of hepatogenous jaundice showed hypercholesterolaemia. From these figures it would appear that a hypercholesterolaemia of over 300 mg. per 100 ml. is suggestive of obstruction, but that figures below this level are of no diagnostic value.

Determination of the serum total cholesterol is of value not only in confirming the more frequently positive serum alkaline phosphatase test, but also in picking up the case of obstructive jaundice missed, especially in the non-malignant groups, by the phosphatase test. In the present series the cholesterol test indicated the presence of obstruction correctly in six cases in which the phosphatase test had failed.

Estimation of cholesterol esters has been advocated, but, as this estimation is time-consuming and has been shown by Hoffbauer *et al.* (1949) to be of little value, it was not carried out in the present investigation.

Plasma Protein

The present results showed that determination of plasma albumin and globulin is of no differentiating value. This is in accordance with the results and opinion of Schwimmer *et al.* (1945) and Sherlock (1946). There is therefore a clear indication for the omission of these determinations from a single-sample test intended only for the differential diagnosis of jaundice.

Thymol Turbidity

This empirical test, first described by Maclagan (1944a, 1944b), has the advantages of being easy to perform, rapid in giving a result, and clear in its numerical assessment of the reaction. Maizels (1946) considered it to be the most useful of a number of empirical tests compared by him. Watson and Rappaport (1945) believed it to be more uniformly negative in obstructive jaundice than the cephalin-

cholesterol test. Franklin *et al.* (1948) found that this test showed statistically the most significant correlation with liver-cell damage.

The test has been criticized for being insufficiently sensitive (Mateer *et al.*, 1947), and this is confirmed by the present results, there being only 16 positive tests in 37 patients (43%) suffering from hepatogenous jaundice. The present results, however, also showed that it was reliable, only 7 misleading results being obtained out of 67 cases (9%) of obstructive jaundice.

None of the 67 cases of obstructive jaundice exceeded 9 units. Maclagan (1947) found none of 56 cases of obstructive jaundice to exceed 8 units; and Hoffbauer *et al.* (1949) found none of 77 cases of obstructive jaundice to exceed 9 units. It would therefore appear that a thymol turbidity of 10 units or over indicates hepatogenous jaundice, irrespective of other findings.

Urinary Urobilinogen and Urobilin

The present findings are similar to those of Cantarow and Nelson (1937). Snell (1947) and Coleman (1950) believed these tests to be of much value. However, as an increase of urinary urobilinogen and urobilin can occur in incomplete obstruction with secondary liver damage, as well as in hepatogenous jaundice, and as absence of both these substances can be found in hepatogenous jaundice at the height of the disease, less reliance can be placed on these urinary tests than on the blood tests. Nevertheless, where the latter are equivocal, the urinary tests may give a hint regarding the cause of the jaundice.

Serial Tests

Repetition of tests has been advocated by many authorities. Although not detailed in the present investigation, 82 tests were carried out on 28 patients. In 22 of these patients the initial biochemical interpretations were subsequently proved to be correct. In five cases with equivocal initial results, subsequent tests altered sufficiently to give a final interpretation later proved correct. In one case, the tests remained equivocal on all three occasions.

Combination of Tests

The present series once again confirms that no single test is absolutely reliable in the differential diagnosis of jaundice. Maclagan (1947), however, combining serum alkaline phosphatase with thymol turbidity results, obtained 68% accuracy. Using the same tests, Hoffbauer *et al.* (1949) had no erroneous results, but their interpretations were equivocal in 30% of cases; and Coleman (1950) found four misleading interpretations in 70 cases. Gutman and Hanger (1941), using serum alkaline phosphatase and cephalin-cholesterol tests in combination, obtained 72% accuracy.

In the present investigation, serum alkaline phosphatase, serum total cholesterol, and thymol turbidity tests have been found to be of most value. The present results have shown the following:

- Serum alkaline phosphatase
Under 20 units indicated hepatogenous jaundice
Under 35 units suggested hepatogenous jaundice
Over 35 units suggested obstructive jaundice
- Serum total cholesterol
Over 300 mg. per 100 ml. suggested obstructive jaundice
Under 300 mg. per 100 ml.—no value
- Thymol turbidity test
Over 10 units indicated hepatogenous jaundice
Over 4 units suggested hepatogenous jaundice
Under 4 units—no value

Obstructive jaundice was therefore suggested by either serum alkaline phosphatase over 35 units or serum total cholesterol over 300 mg. per 100 ml., or by both, when thymol turbidity was not more than 4 units.

Hepatogenous jaundice was suggested by: (1) serum alkaline phosphatase under 20 units, irrespective of other results; (2) thymol turbidity of over 10 units, irrespective of other

results; (3) thymol turbidity over 4 units when serum alkaline phosphatase was under 35 units, and serum total cholesterol under 300 mg. per 100 ml.

The results were interpreted as equivocal when: (1) either serum alkaline phosphatase was over 35 units or the serum total cholesterol over 300 mg. per 100 ml., or by both, with thymol turbidity between 4 and 10 units; (2) both serum alkaline phosphatase was between 20 and 35 units and serum total cholesterol was under 300 mg. per 100 ml., with thymol turbidity under 4 units.

Applying these rules to the individual results, this combination of tests can be correlated with the final diagnosis as in Table III.

TABLE III.—Interpretation of Combined Tests Correlated with Final Clinical Diagnosis

Group	In Agreement with Diagnosis	Equivocal Interpretations	Erroneous Interpretations
1. Carcinoma—obstructing ducts	22	5	0
2. Calculus in common bile duct	14	3	0
3. Chronic pancreatitis	4	0	0
4. Stricture of bile duct	1	1	0
5. Carcinoma—metastases in liver	11	6	0
6. Cirrhosis of liver	9	6	5
7. Acute hepatitis	8	2	1
8. Miscellaneous cases of hepatogenous jaundice	5	1	0
	74	24	6

Although the present accuracy of 71% shows no significant improvement over the figures obtained by Gutman and Hanger (1941), MacLagan (1947), and Hoffbauer *et al.* (1949), despite the addition of the serum total cholesterol determination to the tests, it is felt that this test is justified, as it correctly indicated obstruction in six cases where the serum alkaline phosphatase had failed, and yet on only one occasion was it misleading by itself. Furthermore, as has been shown in Table II, hypercholesterolaemia is more often present in non-malignant causes of obstruction, the type in which the serum alkaline phosphatase is less often helpful.

When the urinary tests were taken into account in those cases with equivocal blood results, in the obstructive groups 10 out of 15 cases showed absence of both urobilinogen and urobilin, three cases showed a misleading increase of these substances, and in the remaining two cases these tests were not carried out. In the hepatogenous groups, seven cases out of nine showed increase of urobilinogen and urobilin; in two cases neither was increased.

After applying the less accurate urinary tests, the final interpretation of the biochemical tests showed:

In agreement with diagnosis	
Blood tests	74
Suggestive urinary tests	17
Disagreement with diagnosis	
Suggestive urinary tests	5
Blood tests	6
Equivocal (urinary tests not done)	2

The erroneous blood tests were limited to cirrhosis and acute hepatitis, and the proportion to the total number in the series was similar to that reported by Coleman (1950).

Summary

A series of blood tests was investigated regarding the value of these determinations for inclusion in a single sample test for the differential diagnosis of jaundice.

Of the tests employed, the serum alkaline phosphatase activity, serum total cholesterol, and thymol turbidity were found to be of most significance. Deter-

mination of the plasma protein fractions was of no value and should be omitted from any single-sample test.

Tests for urobilinogen and urobilin in the urine were found to be of value as supplementary information where the results of the blood tests were equivocal.

Critical levels in the blood tests for the differentiation of hepatogenous from obstructive jaundice are suggested. Applying these criteria in a series of 104 cases of jaundice, the correct diagnosis of the type of jaundice was made in 91 cases. Of the remaining 13 cases, two gave equivocal results, while in 11 the biochemical findings were frankly misleading.

This paper was made possible only through the generosity of Dr. Ian A. Anderson, who gave me free access to the biochemical records of these tests. I cannot adequately express my thanks for his unstinted help and advice. I am also indebted to the physicians and surgeons of the Victoria Infirmary for allowing me the use of their clinical records.

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In his annual report for 1952 the medical officer of health for the County Borough of Smethwick, Dr. Hugh Paul, comments on the rapid decline in infectious diseases, in particular tuberculosis, since the war. He attributes the decline mainly to the use of antibiotics, but he continues: "On the other hand, one cannot withhold a meed of praise to the conscientious chest physicians throughout this country who have achieved remarkable success during the past two generations. Many of us feared when the regional board took over our schemes in 1948 that the glamour of cure would swamp the infinitely more useful but infinitely less attractive aspects of prevention, and that the tuberculosis service would sink to the level of other branches of hospital cure. We have built better than we knew, however, and it would appear that the tuberculosis officers trained by us in the olden days, soaked in the gospel of prevention from their early days and imbued with the desire to look upon their task in the broadest possible light, are continuing in the olden ways, and have evaded the blandishments of the sirens of curative medicine. One can only hope that the new generation of chest physicians will be trained in the same way, but one cannot help but feel uneasy when one reads advertisements for chest physicians stating that the M.R.C.P. is necessary and that previous experience in tuberculosis is desirable. We must not sink to cure."

FLUID CONTENT OF THE NUCLEUS PULPOSUS AS A FACTOR IN THE DISK SYNDROME*

PRELIMINARY REPORT

BY

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The erroneous term "slipped disk," which is often applied to the disk syndrome by the laity, and unfortunately by a large number of their medical advisers, is derived from an impression that trauma is an invariable concomitant of such lesions, yet in a high proportion of cases the onset is insidious. Armstrong (1952) states that approximately 60% of patients with lumbar disk protrusions give a history of injury initiating their symptoms, whilst Eyre-Brooke (1952), in reviewing a series of cases treated by operation, found a similar history in 13.7%. In a series of 121 cases of cervical disk prolapse I have found injury to be a relevant feature in only 9%. As the alleged injury is often trivial in nature, and previous symptoms are often recounted, we must assume that the injury or strain is a precipitating factor only, and therefore that other factors must play a part in the development of the syndrome. It is suggested that one of the many factors is an increase in the water content of the nucleus pulposus.

Göcke (1932) examined the effect of soaking portions of nucleus pulposus in acid, alkaline, and saline solutions, and noted that swelling resulted from the absorption of fluid. Nuclei removed from young subjects took up fluid equal to 95% of their weight when soaked in saline, while those from adult subjects absorbed 50–60% of their weight of fluid, and less than 25% was absorbed by nuclei removed from aged subjects. The increase in weight was greater when nuclei were immersed in alkaline fluid and less when placed in acetic acid. Such a degree of swelling suggests that a similar change within an intact disk would produce a high internal pressure. This prompted the suggestion (Naylor, 1951) that an initial factor in the development of the disk syndrome was a rise of internal pressure due to increase in the fluid content of the nucleus pulposus. The annulus fibrosus would be stretched, producing cervical or low back pain, depending upon the level affected. Should the annulus be thinned, bulging or actual herniation of the nucleus would occur. Once the herniation has appeared mechanical stress would maintain its extrusion. It is possible that the fluid change in the nucleus may be instigated by some endocrine or metabolic factor, and it is probable that the initial change is a depolymerization of the polysaccharide element of the polysaccharide-collagen complex.

Our measurements of the water absorption by the isolated nucleus confirm Göcke's findings, but there seems to be no linear relationship between the amount of fluid absorbed and the ages of the subject. Vary-

ing degrees of absorptive power were found in disks from subjects of similar ages. The annulus fibrosus will also absorb fluid, but to a less degree than the nucleus. The addition of hyaluronidase to the immersion fluid increases the weight of fluid absorbed by 20%. This is probably due to the depolymerization of the polysaccharides, causing reduction of size of the particles and increase in the osmotic power of the nucleus.

Measurement of Pressure Within the Disk

As an initial step a series of experiments was designed to measure the pressure generated within the disk, and an apparatus (see Diagram) was developed for this purpose. The manometer of the apparatus consisted of a glass capillary tube (A) fixed to a 20-gauge serum needle (B) by a brass connector; the joints were sealed with a high-vacuum wax. The needle had a series of slots cut in the distal half-inch to allow an even distribution of pressure to the mercury within the needle and to minimize any blockage. It was bent to 90 degrees at its centre so that it could be inserted horizontally into the disk. A mercury reservoir (C) was connected to another capillary tube (D) fixed parallel to the manometer, the latter being joined to the capillary tube by an inverted U-tube containing alcohol. Alcohol was

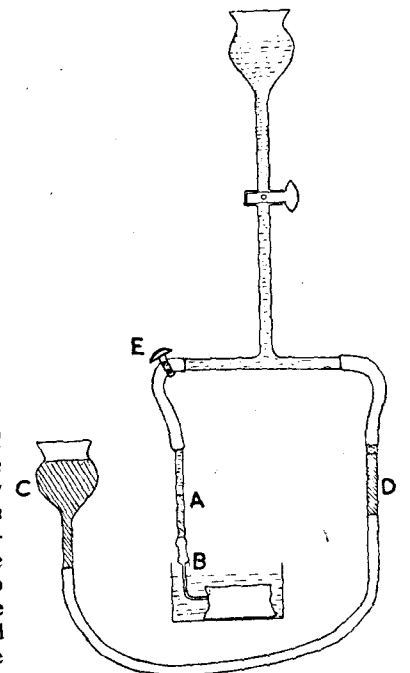


Diagram of apparatus.

used in preference to water as it has a smaller surface tension, giving ease of flow and facilitating elimination of air bubbles. Initially the apparatus was filled with mercury, the manometer clipped off, and alcohol then drawn into the inverted U-tube. The clip (E) was then opened, the manometer needle being immersed in mercury. By alternately raising and lowering the reservoir a column of mercury is drawn into the manometer. The clip (E) was then closed and the apparatus was ready for use.

Fresh lumbar disks from necropsy subjects were obtained with a thin sliver of bone on each side, this being important to prevent any force being expended on producing bulging of the nucleus. The disk under test was pierced by a hollow needle of the same gauge as that in the apparatus, and the manometer needle was then inserted along the track made. This minimized the risk of blockage by tissue. The specimen was then placed in a glass crystallizing dish and the screw clip (E) opened. The mercury in the reservoir and side tube was levelled and a travelling microscope focused upon the meniscus of the manometer and its scale read, the pressure then being equal to that of the atmosphere. The disk was then immersed in fluid, using water or normal saline. To note the pressure developed, the mercury reservoir was adjusted to bring the meniscus in the manometer to its initial level. The height of the reservoir above the level of the disk is then the pressure required to neutralize that developed within the disk. Initially 20 disks have been investigated in this manner.

*Based on a paper read to the British Orthopaedic Association in October, 1952.

Results

Three experiments were valueless, as blockage of the needle occurred and no readings could be obtained. Of the remaining 17, 11 developed a high, measurable internal pressure, whilst one developed enough pressure to rupture the bone end-plate, and no internal pressure was therefore measured. This disk had been cut with a very thin end-plate, and a complete transverse fracture of this developed, with protrusion of the swollen nuclear material. Simultaneously a disk from the same subject developed a pressure of over 80.2 cm. Hg. It was impossible to raise the mercury reservoir high enough to depress the mercury in the manometer to its normal level, and if the movements of reservoir and manometer meniscus are proportional then a pressure of approximately three atmospheres had developed.

The most significant result obtained was the spontaneous rupture of the annulus fibrosus in one specimen, which developed after 17 hours' immersion in water to which hyaluronidase had been added. At the time of rupture a pressure of 20 cm. Hg was measured, but, despite the production of the rupture, the internal pressure had increased to 80 cm. after eight hours' immersion. The disk bulged extensively, and, on section, the rupture of the annulus and herniation of the nucleus were easily demonstrated.

Two disks from very old subjects registered no rise of pressure, the nuclei being small, brown, and dry on section. Evidently no fluid had been absorbed, and this can be explained by the operation of two factors: (a) decreased permeation as a result of sclerosis of the end-plate; and (b) loss of polysaccharide, which occurs with advancing years.

There is little doubt that a large contribution is made by the latter factor. The absence of water absorption and change of internal pressure in disks of aged subjects is consistent with the known decreased incidence of disk prolapse in that age group. If the polysaccharide content of the nucleus is very much reduced, then fluid absorption, and therefore increase of internal pressure, will be minimal or absent and the potentiality of disk herniation reduced. Sylven (1951), using metachromatic staining methods, showed that the mucoid element in the nucleus was reduced with advancing degeneration. During the course of x-ray diffraction studies of intervertebral disks we have obtained confirmatory evidence of this (Happey, McRae, and Naylor, 1953). *In vivo*, where there is a compression force due to the superimposed body weight, a smaller absorption of fluid would lead to the development of considerable internal pressure.

A compression force was applied to disks, placed in the apparatus previously described, by means of a flat steel bar, weights being added to its ends. With the dry disk a gradual addition of weight was accompanied by a rise of internal pressure, except in those which showed advanced degeneration. The latter had lost their elasticity, and compression caused no rise of internal pressure, while subsequent immersion during maintenance of pressure was without effect. In contrast, a disk from a subject aged 35, compressed by a load of 24 kg., showed a rise of internal pressure from 47 to 119 cm. after immersion in water. Preliminary experiments in which absorption from one or both end-plates is blocked suggested that the fluid reached the nuclei by permeation through the end-plate.

Discussion

The preliminary experiments show that a high pressure can be developed within an intervertebral disk by absorption of fluid, this most probably entering through the bony end-plate. It is postulated that the possible sequence of changes leading to the development of the disk syndrome consists of: (1) depolymerization of the polysaccharides of the collagen-polysaccharide complex in the nucleus pulposus, leading to (2) increased power of water absorption, causing (3) absorption of fluid by the nucleus, the fluid

entering via the end-plate; (4) increase of pressure within the disk. The forces developed by leverage and muscular action would augment this.

It is possible that a return to the *status quo* by a process of polymerization does not occur, but that the internal pressure falls to normal as the depolymerized molecules are absorbed. This process can be repeated with each episode of symptoms, and would explain the gradual development of degenerative change in such disks. A stage is ultimately reached when the disk has degenerated to such an extent—and thereby lost its water absorption power—that prolapse cannot occur. It is possible that a similar process in multiple disks produces attacks of "fibrositis."

Further and more extensive experiments are being conducted to investigate this hypothesis, using modified apparatus to measure the high pressure generated within the disk.

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Medical Memorandum

Thyrototoxicosis Complicated by Thrombocytopenic Purpura

The association of thrombocytopenic purpura with a toxic goitre is rare. The literature reveals approximately twelve such cases (six female and six male). In several the clinical picture may have been complicated by the administration of myelotoxic drugs (Jackson, 1931; Corson, 1942; Fewell *et al.*, 1950; Hart, 1951). In the remainder no such complicating factor is evident (Finochietto *et al.*, 1936; Lavastine and Cachin, 1940; Woodruff, 1940; Bomford and Rhoads, 1941; Bicknel and Dicker, 1942; Conklin and Shank, 1944; Roberts, 1948). In the following case associated drugs, such as bismuth, "sedormid," or thiouracil, were not given before the occurrence of the purpura. The purpuric manifestations were associated with the thyrotoxicosis before treatment. Propylthiouracil was administered pre-operatively after the combination of the two diseases had been noted.

CASE REPORT

A woman aged 62 was admitted to hospital on September 5, 1951. She had been breathless on exertion for years, but this had been aggravated after a three-weeks period in bed for generalized joint pains in January, 1951. Ten days before admission a slight cough and a mild tonsillitis developed. A small haemoptysis occurred with the onset of the cough. Blood had been passed per rectum, and a widespread purpuric rash had developed over the body and limbs and in the mouth. She had bruised very easily and had lost weight over the past year. A mild degree of ankle oedema had been present for years. She had had a right-sided pneumonia with pleurisy forty years before, and several attacks of tonsillitis since. There was no history of rheumatic fever and no relevant family history.

Physical examination revealed a cachectic-looking patient who was dyspnoeic. The mucous membranes were pale, the teeth were decayed, and a mild bilateral tonsillitis was evident. Tremor was marked. The hands were warm and moist. The thyroid gland showed a generalized enlargement of both lobes. Multiple purpuric spots were apparent all over the body and on the gums and tongue. Pulse rate 90. Rhythm regular. The apex beat was displaced laterally. On auscultation the grade II apical systolic murmur was heard and crepitations were present at the bases of both lungs. There was a mild degree of ankle oedema. The liver

was enlarged and the spleen was easily felt. The blood pressure was 160/75. The haemoglobin was 29%, red cells 2,000,000 per c.mm.; the white-cell and differential counts were normal. No platelets could be seen. The bleeding-time was 14 minutes, clotting time 5 minutes, and prothrombin time 94% of normal.

On the day after admission more blood was passed per rectum, and her condition was deteriorating; she was therefore transfused with 4 pints (2.3 litres) of blood, with much improvement. The haemoglobin rose to 50%, and a platelet count six days after admission was 180,000 per c.mm. A marrow biopsy was normal; the leucocyte:erythrocyte ratio was 6:1; megakaryocytes, normal in number, showed no obvious morphological abnormality.

A week later her condition deteriorated. New petechiae appeared over the trunk. The bleeding-time had risen to 20 minutes, and the platelets had fallen to 70,000 per c.mm. and the haemoglobin was 54%. During the next week her condition fluctuated, with a tendency to improve. From the twenty-fifth day until discharge, 36 days after admission, progress was maintained, the haemoglobin rising to 76%, and the platelet count to 186,000 per c.mm.

A culture from the throat revealed no pathogenic organisms. Thyroid metabolism, estimated by radio-active iodine tests, showed results which were consistent with a moderate thyrotoxicosis. Blood cholesterol was 121 mg. per 100 ml. An electrocardiogram showed the pattern of left ventricular strain. A skiagram of the chest revealed signs of old tuberculous infiltration at the right apex. Liver-function tests were all normal. Propylthiouracil therapy was started twelve days after admission, in doses of 50 mg. three times a day. In addition penicillin was given for the tonsillitis, with iron and vitamins for the anaemia.

When seen in the out-patient department on November 1 she was still showing signs of early heart failure, and there had been a recurrence of the purpura. She was still taking propylthiouracil.

She was readmitted to hospital on November 5, showing very much the same clinical picture as before, but to a less degree. She was dyspnoeic and pale. The thyroid gland was more enlarged than previously. The hands were moist and tremor was marked. There was widespread purpura, especially on the legs. The haemoglobin was 62%, with 4,000,000 red cells per c.mm. The white-cell and differential counts were normal. The platelet count was 165,000 per c.mm. The blood cholesterol had risen to 160 mg. per 100 ml. Partial thyroidectomy was decided upon to control the thyrotoxicosis. The petechiae gradually cleared, and, apart from an epistaxis and a small subconjunctival haemorrhage into the left eye, the patient was relatively well. Propylthiouracil therapy was continued up to the time of operation, the dose having been doubled.

A partial thyroidectomy carried out one month after the second admission was uneventful. She had a mild pyrexia for four days after this. A little extra bruising of the neck occurred around the wound, but there was no fresh attack of purpura. Auricular fibrillation supervened for four days after the operation, normal rhythm then being resumed without treatment. The thyroid gland, which was large and fleshy, showed, on section, changes characteristic of toxic adenoma, modified by thiouracil.

The patient was discharged from hospital forty days after her second admission. The haemoglobin was then 86%, and the platelet count 170,000 per c.mm. She had gained 9 lb. (4.1 kg.) during the second admission period and looked fit and well.

COMMENT

The association of thrombocytopenic purpura with certain endocrine disturbances is not uncommon. Numerous authors have reported this association with pregnancy. Minot (1936) and Pohle (1939) showed that thrombocytopenic purpura may occur in certain phases of the menstrual cycle. In the above case thrombocytopenic

purpura complicated thyrotoxicosis, and there is no suggestion in the history of any other intoxication, such as from myelotoxic drugs. So far as can be ascertained, the thyrotoxicosis preceded the purpura. The incidence of the combined diseases seems to be about equal between male and female. No case has occurred below the age of 28. Probably the total number of cases reported of the combined diseases, without any complicating factor, is less than ten. Wintrobe (1946) believes that there is no adequate reason to assume that the combination represents more than the coincidence of two unrelated diseases. The paucity of cases lends some support to this opinion. On the other hand, Woodruff (1940) takes the opposite point of view, and believes that the leucocytes and platelets are specifically affected by the thyrotoxic state. He believes that the degree of toxæmia produced may either stimulate or depress the number of platelets, according to the mildness or severity of the degree of toxæmia.

In a discussion on the cause of idiopathic thrombocytopenic purpura, Robson (1949) suggests that the spleen and other reticulo-endothelial tissues produce some factor which alters the state of the capillaries and reduces platelet formation from megakaryocytes. Such might be the case here. It does seem possible that the state of capillaries was a more important factor than the thrombocytopenia, on re-admission, when purpura was still evident with a platelet count of 165,000 per c.mm. It seems reasonable to suppose that the activity of the spleen might be reduced with the reduction of lymphatic hyperplasia which occurs after thyroidectomy. It was felt after readmission that partial thyroidectomy was necessary in this instance. Propylthiouracil, while having some effect on the thyrotoxic state, did not seem to benefit the purpuric manifestations. In view of the case reported by Fewell *et al.* (1950), in which purpura followed propylthiouracil therapy, it seems wiser not to use this drug when the two diseases are combined. It is suggested that operation is preferable to drug therapy when thrombocytopenic purpura and thyrotoxicosis co-exist.

Our thanks are due to Dr. Kenneth Robertson for permission to publish this case, and to Mr. L. A. Richardson, who carried out the partial thyroidectomy. We would also like to thank the laboratory for the haematological investigations, and the radio-therapeutic department for the radioactive iodine tests.

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The new radiological department of the Clatterbridge Hospital, Bebington, Cheshire, was officially opened on October 2 by Dr. Peter Kerley. The department is entirely self-contained and has been planned to give direct access to the operating theatre and easy communication with the wards. It is divided into three main sections for general and fluoroscopic work, pulmonary, cardiac, and gastro-intestinal examinations, and for genito-urinary investigations.

Reviews

GASTRO-INTESTINAL RADIOLOGY

Gastrointestinal X-ray Diagnosis. By Max Ritvo, M.D., and I. A. Shaffer, M.D. (Pp. 838; 470 illustrations, with two in colour. £7 10s.) London: Henry Kimpton, 1952.

Drs. Max Ritvo and I. A. Shaffer have written an important book intended mainly for the radiologist and gastro-enterologist. After an introductory section of twenty-six pages the whole of the alimentary tract is considered serially from pharynx to rectum. Sections follow on the gall-bladder and liver, the pancreas, spleen and abdomen, and abdominal herniae. The scope of the book is wide. The authors have omitted very few lesions of the alimentary tract that are susceptible to x-ray demonstration. The pattern of the work is admirable from the radiologist's point of view, since in the description of each lesion of any importance the authors include an account of the aetiology, pathology, and clinical signs and symptoms in addition to the x-ray manifestations.

It is inevitable that the reviewer will find in any work like this some matters with which he is at variance, and in this one there are a few. The technique of examination of duodenal ulcer is not described in sufficient detail to be informative and some of the complications following gastric operations are not mentioned. The modern views on the causation of hiatus hernia do not appear: it seems that the authors regard most of these hernias as congenital. The views expressed on chronic appendicitis lack clarity. Various x-ray signs of chronic appendicitis are described, but whether or not there is such a pathological entity is left in the air.

These criticisms of detail are small in the perspective of the work as a whole, which is outstandingly good. It is a compendium of information, readable, beautifully produced, and abounding in well-chosen illustrations. In spite of the price, which, as of most American books nowadays, is high, it is a book warmly to be commended to all who are engaged or interested in gastro-intestinal radiology. It is a credit to the great school in Boston from which it comes, and the authors are to be congratulated on an outstanding work.

S. COCHRANE SHANKS.

EAR DISEASE

Lehrbuch der Ohrenheilkunde. By Dr. E. Lüscher. (Pp. 414; 246 figures. £3 6s. 6d.) Vienna: Springer-Verlag, 1952.

In his preface the author refers to the important advances in treatment by the systematic use of sulphonamides and antibiotics, in the new approach to the physiology of hearing by the extended use of electro-acoustic apparatus, fresh methods of vestibular investigation, and the important operation on non-inflammatory diseases of the ear—all developed during the last decade—and he considers that these facts call for this up-to-date book. Professor Lüscher has certainly justified his opinion, and it is striking that he has carried through this exacting task without calling on colleagues except to write on audiometry; here he has the assistance of the head of the acoustic laboratory, Dr. Zwislocki.

The book is arranged on conventional lines. Chapters on the anatomy and physiology of the ear are followed by a detailed description of the methods of examining the ear and tympanic membrane and of the testing of hearing and vestibular function—all fully illustrated. The student will find the early tests simple to follow, but the modern audiometric tests and their application are more suited to the expert. Audiometry is discussed very fully. The audiometer used and illustrated is that designed by Zwislocki and made at Basle. Tuning-fork tests and their results are compared with audiograms, intelligibility versus intensity being illustrated by good diagrams. The author's "ear-

microscope" allows a ten-fold enlargement of the view of the tympanic membrane to be obtained and coloured photographs to be taken. It is of great interest, and the reproductions of normal and abnormal conditions are lavishly scattered through the text. Such magnified views are so unusual that their interpretation requires practice. The use, too, of Dishoeck's "pneumophon" to investigate the function of the Eustachian tube is explained.

For the treatment of acute otitis media the author advises sulphonamides in the first place, and then penicillin unless an alternative is indicated by the organism found in the ear discharge; when paracentesis is required the incision is to be made from above downwards instead of from below upwards as recommended in English books. The simple mastoid operation is described but not illustrated. Chronic suppurative otitis media is divided into two classes—with and without cholesteatoma—and the author describes the radical operation and discusses the endaural and postaural approaches. Complications are treated in the usual way, and their pathology is admirably explained with excellent microscopical slides. For treating cerebral abscess the author advises an approach through a radical mastoid operation, though the neurosurgical approach is subsequently mentioned. It is interesting to find positional vertigo and nystagmus with their possible causes discussed. Ménière's disease and treatment are fully described. Vitamin B₁ has been found of considerable value.

This book is of such a high scientific standard that it would appear to be more suited to experts than students. Separate chapters on important subjects would make for easier reading and reference. The author gives evidence of world-wide reading, and quotes from Continental, American, and British authors, but it is unfortunate that he gives no references for readers who might wish to study the original papers. The specialist will find lucid descriptions of the science of audiology and modern work with the speech audiometer, together with the means of determining the site of the lesion causing deafness. The author fully discusses otosclerosis in relation to the fenestration operation, the choice of cases, prospective improvement, and complications. He describes the operation in detail but shows only two pictures, both Lempert's. There is one excellent photomicrograph depicting the results of a successful operation three and a half years previously. A special feature is the number and quality of the illustrations, many of them coloured, illustrating clinical conditions. These are in addition to the numerous coloured pictures of the tympanic membrane, of which all are good; perhaps those of exudative otitis media and rupture of the membrane stand out. The work will surely have a wide circulation among readers of German.

W. M. MOLLISON.

SURGICAL EXPOSURES

An Atlas of Surgical Exposures of the Extremities. By Sam W. Banks, M.D., and Harold Laufman, M.D., Ph.D. (Pp. 391; 552 illustrations, on 179 plates. £3 15s.) Philadelphia and London: W. B. Saunders Company, 1953.

A sound knowledge of anatomy is a necessity for a good surgeon. That is why the aspirant to the higher surgical diplomas must demonstrate to the examiners that he possesses such knowledge. A surgeon in active practice should have constantly in mind the normal anatomy of the part on which he is operating and ought seldom to need a series of pictures to show him how to approach the various aspects of the limbs. But memory is often fallacious, and surgeons sometimes find it difficult to keep up their anatomy, and some doctors whose anatomy is very rusty may, in a case of emergency, have to operate. For such this sumptuous book will be helpful.

The atlas consists of 179 pictorial plates on each of which are three or four illustrations of the structures met with in exposing various parts of one or other extremity. It is designed "to serve the student and resident in surgery . . . and to be a timely refresher to the experienced surgeon who operates on the extremities only occasionally."

The illustrations were all specially prepared and were based on photographs of actual dissections of the cadaver, so that the "final drawing is in every case a faithful representation of the anatomical findings encountered at surgery." This must have entailed an enormous amount of work, and the authors are to be congratulated on the successful result.

But a word of caution must be sounded. Every senior surgeon knows, and the junior surgeon will soon learn, that in many if not in most instances the parts seen at operation are seriously altered by disease or trauma, and the normal appearances depicted in this book will appear distorted and sometimes almost unrecognizable. Moreover, in dealing with malignant tumours one may have to discard all set incisions in order to cut clear of the growth. The pictures here will no doubt help many a novice and may give many a useful suggestion to the experienced surgeon. It would be a good plan if at least some of the main exposures could have been printed in colour, though no doubt that would have added greatly to the expense.

ZACHARY COPE.

STAMMERING

Understanding Stuttering. By A. B. Gottlob, A.B., Ph.D. (Pp. 274. \$5.50.) New York: Grune and Stratton, 1953.

This book is intended primarily for stammerers—or stutterers, the designation preferred in the United States—and their parents, relatives, and friends, in the hope of assisting the patient who would otherwise receive no understanding or help. Nevertheless, all who are concerned with speech therapy will derive much benefit from perusing it, although one can scarcely agree with the author that the term "block-ing" is preferable to "stammering" or "stuttering"; in fact, to find a stammerer continually referred to as a "blocker" becomes somewhat irksome.

After a simple outline of the physiological mechanism of speech, Dr. Gottlob gives a very good description of the various problems of personality associated with stammering. This is probably the most valuable part of the book, especially the observations on the upbringing of children of so-called nervous temperament. He gives some sound advice on preventive measures in psychoneurotic reactions, not only in relation to speech disorders but also in general circumstances.

As regards treatment, the author postulates four main therapeutic procedures: (1) the education of the patient to the understanding of his disorders; (2) reconditioning, by which he means the production of new speech patterns to replace the former and undesirable patterns, with the object of enabling the muscles concerned with speech to function more smoothly; (3) relaxation, both physical and mental, to reduce emotional tension; and (4) psychotherapy, both individual and group. This aims at uncovering the original and underlying causes of the speech disorder and any possible factors aggravating or sustaining the abnormal condition. While most of the methods described are advantageous for application to adult and adolescent patients, some are scarcely suitable for young children.

Certain of the author's views on the aetiology of stammering might not meet with general acceptance. But on the whole the debatable matters in the work are few, and Dr. Gottlob has made a valuable contribution to that difficult problem—the treatment of stammering.

C. WORSTER-DROUGHT.

CARDIAC ARRHYTHMIAS

Extrasystoles and Allied Arrhythmias. By David Scherf, M.D., F.A.C.P., and Adolf Schott, M.D. (Heidelberg), M.R.C.S. (Pp. 531; 212 figures. £5 5s.) London: William Heinemann, 1953.

This book is a most comprehensive treatise on a subject that has slipped quietly into the background nowadays. Thirty years ago the riddles of these disorders of rhythm were still the main object of interest for doctors using the electrocardiograph. But although their importance has hardly much share of the limelight in these times, and has rather

diminished in consequence, there is still a great deal that we do not know about them. Not infrequently one may wonder whether they do not require more attention. This book supplies everything that can be asked for at present. The opening historical chapter is very well done; the older accounts and conclusions are interesting to read. How that genius Morgagni, as usual, has often the first (and last) word to say on the subject!

In a long chapter the authors discuss the various types of extrasystole. They classify them by their site of origin as shown by the electrocardiogram and also by other signs. The authors conclude that extrasystoles which show varying forms in the electrocardiogram, and so are presumably from different foci, indicate myocardial disease.

There is a full description of the theory of parasystole; digitalis and infection are held to be the causes. A chapter is devoted to alternation of the pulse; flutter, fibrillation, and paroxysmal tachycardia are included, for the authors consider that the mechanism underlying these arrhythmias is akin to ectopic beats, particularly the auricular. It is satisfactory to see these discussed again in relation to modern knowledge. The physiological aspects of extrasystoles are fully considered.

The authors' style is clear and concise and free from jargon. The illustrations for the most part are very good, but some are dim and blurred. Usually the standard leads and one or two chest leads are shown. There is a summary at the end of each chapter, but sometimes it is disappointing and merely indicates what has been mentioned. There are full references. This is an admirable work; the clinical aspects are fully discussed; the opinions and judgments are sound. All cardiologists will want to have this book on their shelves and will often refer to it. It is much more than an academic study.

TERENCE EAST.

A PATIENT'S DRAWINGS

Schöpferische Gestaltung aus dem Unbewussten: Ein analytisches Bilderbuch. By Dr. M. Schultze-Niemann. (Pp. 45; 26 figures. M. 12.) Munich: J. F. Lehmanns Verlag, 1953.

Psychotherapeutic schools have searched hopefully, though with little success, to find standard procedures of treatment which could be applied with benefit by any trained and intelligent technician. But success in psychotherapy seems to require a personality endowed with intuitive and aesthetic gifts, so that the subtle play of unconscious motivations can be readily divined and appreciated. Psychotherapeutic practice has remained an art which has had a special appeal for artistically sensitive persons. It is no wonder therefore that there has been a recurrent tendency for therapeutic art to change into art therapy, affording pleasure to both patient and doctor.

In this book the author has attempted to share with a wider public the pleasure she derived from a course of psychotherapy which relied largely on the interpretation of drawings and paintings a patient had been encouraged to produce. There is no doubt that the author has been successful in her endeavour, for the book provides excellent reproduction of thirty-two pictures and an imaginative analysis of them in the text. The author wisely makes no claim about the particular therapeutic virtue or superiority of this form of treatment. The patient, a 29-year-old single woman, suffered from depressive symptoms following upon the death of her father. She recovered after nine months of treatment, having painted fifty-two pictures. Psychotherapy continued for another fifteen months and a total production of 300 paintings.

In her theoretical introduction the author refers mainly to the work of J. H. Schultz (the author of "autogenous training" as a psychotherapeutic method), who writes a foreword, and to K. Schultze-Jahde, who provides a theoretical framework couched in unattractive German neologisms. But the book can be enjoyed without this theoretical encumbrance, which is not an essential part of it.

F. K. TAYLOR.

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FAMILY DOCTORS AND PUBLIC HEALTH

The general practitioner of forty years ago was as well equipped as anyone else to deal with the social consequences of ill-health. But times have changed, and, though personality and integrity are as important as ever, medicine is no longer confined to bedside therapeutics and such amelioration as wise counsel brings. The public in a Welfare State expect, and indeed have a right to, what is now often called social therapeutics, and the wise family doctor will accept all the aid which his colleagues in the health departments of local authorities can give him. The growth of the hospital service has shown the need for many auxiliaries—physiotherapists, occupational therapists, almoners, and others—to assist the consultant. Similarly, in general practice the local health authority through its medical officer of health is required to provide the general practitioner with his helpers—midwives, home nurses, health visitors, domestic helps, and so on. The General Practice Review Committee in its recently published report¹ concluded that there was no need for an atmosphere of competition to persist between general practitioners and public health departments. And on another page in this issue Dr. J. S. Thomas, himself a general practitioner, in making a forceful plea for bringing the health visitor into the family-doctor team, emphasizes the fundamental change which the N.H.S. Act, by providing a full medical service for the whole population, has made in the orientation of the local authority services. Dr. Stephen Hadfield, in his field survey of general practice,² noted good relations with the public health service when the general practitioner was doing part-time work in a clinic—a finding only to be expected, for in this way the general practitioner can obtain a much better insight into the purposes behind the work of the health department.

In the past the medical officer of health was always requesting information from general practitioners—who often did not see the point of the inquiries because their training in the principles of preventive medicine had been inadequate—but now he is in the happier position of providing some assistance. The

¹ *British Medical Journal Supplement*, 1953, 2, 131.
² *British Medical Journal*, 1953, 2, 683.

district nurse, or home nurse, now employed by the local health authority, is an accepted and welcome helper to the general practitioner. The relationship with the midwife is not always so happy, but in very few areas is there a co-ordinated scheme of midwifery where the responsibilities of the hospital, the general practitioner, the midwife, and the local authority clinics are integrated into a well-knit scheme. There is need for a frank discussion among all concerned to achieve this desirable end. The domestic help service, although not free of charge, is accepted as an important contribution to the stability of a household in sickness, disability, or during childbirth. This is a new service for the local health authority to administer, and not all doctors are yet conversant with its working, though the medical officer of health is always willing to explain.

The newest recruit to the growing army of those who can help the general practitioner in his work is that sometimes controversial figure the health visitor. Even to-day it comes as a surprise to some doctors to learn that she is a State-registered nurse, a midwife, and also trained in social medicine. She came into the scheme of things primarily as a health educator with special responsibility towards the mother and child. Her success in this field has, despite the difficulties, been great. Under the National Health Service Act the scope of her work has been widened, and this is not always appreciated even by the health visitor herself. Elsewhere in this issue we reprint the paper read at this year's Annual Meeting by Dr. Llywelyn Roberts on the subject of the health visitor and the family doctor, and in this he not only makes plain the scope of the routine work of the health visitor but he also enumerates the ways in which she can help the G.P. Essentially a field worker, she can assist the family doctor in the care of the mother and child in seeing that his instructions on infant feeding and care are carried out, and she can also help him to supervise the welfare of the aged, the disabled, and the tuberculous in their homes.

Dr. Hadfield found that 28% of the general practitioners he questioned complained bitterly about the activities of health visitors. Some medical officers of health, convinced in their own minds that health visitors are the backbone of the public health service, take the view that those who remain hostile to the work of health visitors can be ignored as reactionaries. But such a view overlooks what has been, and often still is, a serious fault in the organization of a public health department. The ignorance of some general practitioners may be lamentable, but how often is it due to the failure of the M.O.H. to enlighten his colleagues in general

practice about the purpose of the work of health visitors? The Hadfield report should stimulate medical officers of health to make much greater efforts to explain the work of health visitors to the general practitioners in their areas and to impress on health visitors the fact that their work loses much of its point if they have not succeeded in obtaining the good will of general practitioners.

The success or otherwise of the health visitor will depend more and more on a satisfactory working arrangement being established between her and the general practitioner, so that she is working with him and for him in essentially the same way as the district nurse now does. She is employed by the local health authority, but should be able to work directly for the family doctor. During the discussion which followed the reading of the papers by Drs. Roberts and Thomas at Cardiff last July, Dr. Mary Esslemont made a plea for direct contact between general practitioners and health visitors, preferably by telephone, and it is good to learn that in some parts of the country medical officers of health are doing all they can to encourage general practitioners to ring up the health visitor when they feel her experience can be helpful. Many successful schemes of co-operation are in being, not only between health visitors and general practitioners, but also between health visitors and hospitals. In Cambridge, for example, the consultant and almoner in the hospital, the family doctor, the home nurse, the health visitor, and the home help all work together in arranging for the patient's early return home from hospital. Undoubtedly, much more could be done on these lines to increase the availability of hospital beds.

There are many outstanding problems affecting the general practitioner and the health department yet to be solved. Little has been done in the home care of the mentally ill patient, whose illness is often conditioned by environment, which can sometimes be influenced. Housing is one of these environmental factors, and the medical officer of health is often asked to assist. Rehousing is difficult during the present shortage of houses, but is made easier if undertaken in co-operation with the medical officer of health and the general practitioner. There are a number of other important aspects of general practice where team-work is essential. The field of health education has not been fully explored. It offers great possibilities, and is essentially one for co-operative effort. Similarly prevention, at one time restricted to the sphere of infectious diseases and the prerogative of the medical officer of health, is now a much wider matter embracing many fields of medicine; moreover, it holds out some possibility of reducing the

high cost of the medical services, apart from the alleviation of suffering. Associated with the study of prevention is the wider subject of research and local investigations into ill-health—and here again co-operation between the medical officer and the practitioner could be fruitful and interesting.

But co-operation is not something that can be made to order. The cleavage between various branches of the services has unfortunately been too deep and lasted too long. Co-operation springs from mutual understanding and confidence. It must grow gradually, and should not be forced on unwilling participants. Greater co-operation is inevitable, for the advantages are too great for it to fail. Both branches would do well to forget their past disagreements and with an open mind find out the best in each other for their mutual benefit and for the sake of the patient.

FORCEPS DELIVERY

The evolution of obstetrics is largely governed by two sets of factors—those which derive from progress in medicine in general, and those which follow advances in knowledge, refinements in technique, and extensions in facilities specific to midwifery. In his paper delivered at the Annual Meeting of the B.M.A. in Cardiff in July this year and printed in this issue of the *Journal*, Professor T. N. A. Jeffcoate describes how over the last 25 years these two groups of factors have effected a striking fall in maternal and foetal mortality and morbidity, and how in particular they have caused us to review the place of forceps in present-day obstetrics. He points out that in hospital practice the forceps delivery rate has almost trebled during the last quarter-century, an increase obtained at the expense of spontaneous deliveries, not of caesarean sections; indeed, section has largely replaced the difficult mid-forceps operation. This increasing use of forceps cannot be condemned as meddlesome midwifery, for it has been attended by a considerable reduction in risk to mother and baby. It is not surprising, therefore, that the discussion at Cardiff revealed that the forceps rate was as high or even higher in private practice. As Professor Jeffcoate puts it pithily, "Babies previously born dead with forceps are now being delivered alive by caesarean section, while those stillborn as a result of spontaneous delivery are now extracted alive with forceps."

The improved results of forceps delivery are due partly to improvements in technique and partly to a change in our ideas on the indications for forceps. Technically, for example, the accurate cephalic application of the blades reduces the risks to the foetus, while the use of local analgesia increases the margin

of safety for the mother. As to the indications for forceps, the keynote has become intelligent anticipation of the traditional indications, reinforced by the belief that the duration of the second stage of labour can be allowed to exceed two hours only to the detriment of the mother and baby. This freer conception of the indications applies in large measure only to hospital practice, where there are adequate facilities for treating any unexpected complication. In domiciliary practice, where the careful antenatal selection of patients for confinement in hospital will largely obviate the necessity for operative delivery at home, conservatism probably remains the better course: forceps should be reserved for cases where there is a clear indication and where all the conditions for a low-forceps delivery are fulfilled.

If these precautions are disregarded the result may be a "failed forceps." This disappointing and disconcerting sequel is discussed in some detail by Dr. R. G. Law in a paper on page 955 of this issue of the *Journal*. It is a complication which is not restricted to domiciliary practice, but in hospital the consequent problem of the method of choice for delivery is more easily resolved. Dr. Law points out, as others have done, that the three common causes of failure are unrecognized malposition of the head, incomplete dilatation of the cervix, and disproportion. More than one of these may be operative in any one case, and the first is more commonly the cause than both the others together. Disproportion is more likely to be overlooked in the multiparous woman, in whom the history of a normal delivery of an averaged-sized baby is no guarantee that there will be no difficulty with a larger foetus. It is surprising and indeed discouraging to note that there was a history of previous dystocia in 8 of the 16 multiparae in Law's series. He remarks on the difficulty there may be in diagnosing disproportion in the multigravid after the onset of labour, but in hospital more frequent recourse to intranatal radiography is very rewarding.

Failure due to incomplete cervical dilatation or to an unrecognized malposition points the moral that no one should embark on a forceps extraction unless experienced in vaginal palpation and in recognition of the "touch-picture" of the presenting part. The cervix should not be palpable either during contractions or in the intervals between them, and none of the head should be palpable abdominally. Dr. Law points out that for accurate diagnosis examination under anaesthesia may be necessary, but he wisely adds that the induction of anaesthesia does not and must not commit the obstetrician to undertake immediate delivery if the findings are adverse. The importance of this is amplified by Professor Jeffcoate, who graphically describes the tragic train of events, based on pride and prestige, which may ensue when

unexpected difficulty is encountered in a forceps delivery because of an unrecognized malposition or contraction of the pelvic cavity, culminating in the substitution of force for skill and in the infliction of severe injury on mother and baby. He draws attention to the advisability of recognizing that there is a place for a "trial of forceps," a procedure first advocated nearly fifty years ago. He contends that if all mid-forceps deliveries in hospital were viewed as trial operations, the dread of failure would disappear from the mind of the operator and he would be happy not to proceed in the face of difficulty. This attitude might well be extended to cover all cases of forceps delivery, at home as well as in hospital, although if the precautions mentioned above for forceps delivery at home are observed a failure to deliver will be rare. Nevertheless errors of judgment can occur, and if each case were regarded as a trial of forceps, to be abandoned courageously if it did not proceed smoothly, then the current ignominy would be detached from the "failed forceps" to the benefit of all three individuals concerned, the mother, the baby, and, not least, the obstetrician.

PHENYLBUTAZONE ON TRIAL

There is a lot to be said for trial by jury compared with the ordeal by fire or water, and not least in the field of medicine. Clinical trial in the past, especially just after the introduction of a new drug, was apt to be an ordeal. If the patient survived and the drug seemed to aid the healing power of nature, the advertising began. But nicer distinctions are possible now, when the evidence is usually marshalled in such a way that it can be added up and assessed impartially by the jury of readers and by posterity. In the June issue of *Annals of the Rheumatic Diseases* there are three papers on the effects of treatment with phenylbutazone ("butazolidin"). They contrast notably with each other, each showing a different approach to what is eventually the same problem—namely, is this drug useful in the treatment of a particular disease? Each approach is appropriate to a certain stage of development of our knowledge: first, the trial tentative, giving grounds for belief that the substance might be useful; then the trial statistical, showing that, with a certain dosage for a certain time, one method of treatment shows results significantly or not significantly different from those of another; finally, the trial magisterial, when a substance already found to be useful is administered, and the results are stated, but without detailed comparisons with any other treatment. In this category falls the paper by J. P. Currie and his colleagues.¹

Currie first brought phenylbutazone into current medical practice, and has therefore a longer experi-

ence of it than most. After reviewing the pharmacology of this and related drugs, he and his colleagues write in general of their experience with 424 patients with rheumatoid arthritis. These include 81 patients given injections whose cases were reported previously,² and we infer that most of the other patients received the drug by mouth. These authors claim that a blood level of 8–11 mg. per 100 ml. is needed for the suppression of symptoms in rheumatoid arthritis, and that this can usually be achieved by a dosage schedule of 800 mg. (in four doses) on the first day, followed either by 200 mg. per day thereafter (the earlier dosage schedule) or followed by 600 mg. for two days, 400 mg. for two days, and 200 mg. thereafter, as in the later dosage schedule. Complications were few (4.7%), and in only three cases was the treatment stopped because of them. (A rash appeared in one and oedema in two.) This contrasts markedly with the average of 23% listed from other series (range 0–100%), because of careful dosage and careful selection, "avoiding the aged and all suspected of having a poor cardiac reserve." Another factor was the introduction of keratin-coated tablets, administered to an unspecified number of patients, since which no digestive disturbances occurred. The results are given in the statement that 95% were subjectively improved ("pain, tenderness, and well-being"), 93% showed improved performance, and 30% showed objective improvement judged by joint measurements and appearance and sedimentation rate. The evidence for this statement has been assessed by the authors but is not available to the reader.

J. Fleming and G. Will, the authors of another paper³ in the same issue, cite five cases of acute rheumatism whose recovery coincided (within a few days) with the giving of phenylbutazone. The patients had previously shown little or no response to salicylates. The evidence as presented is insufficient to convince the reader, for in a self-limited disease the chances of recovery occurring at a certain time in only five cases are obviously not entirely remote. The authors conclude in their summing up that these results are sufficient to "raise the hope that further experience will establish butazolidin as a useful drug in the treatment of acute rheumatic diseases."

By contrast in the same issue R. L. Mason⁴ sets forth clearly and with all the evidence a comparison between the relative efficiency of phenylbutazone and corticotrophin in rheumatoid arthritis based on six patients. Despite this small number the conclusions

can be seen to be soundly based, because all the evidence is available and analysed. Justice is not only done but is seen to be done. Mason found that phenylbutazone, in contrast to corticotrophin, produced no significant change in erythrocyte sedimentation rate or in joint size. A decrease was seen in 17-ketosteroid excretion compared with the usual increase during treatment with A.C.T.H. On the other hand the two types of treatment caused much the same decrease of pain and tenderness and much the same increase in function. Other controlled trials on rather larger series of cases⁵⁻⁸ have shown with varying degrees of conclusiveness some superiority of phenylbutazone as an antirheumatic drug to such substances as "inert" tablets, saline, gentisate, amidopyrine, salicylate, and tab. codein. co., used in the various control series. In short, the evidence presented to date indicates that phenylbutazone is in many but not all cases of rheumatoid arthritis a more effective drug than aspirin in relieving pain and disability, but that it is also more dangerous; and it is similar in potency to corticotrophin in its effect on pain and function in that disease.

PARATYPHOID FEVER AND CREAM CAKES

Some unusual features were found in the large outbreak of paratyphoid fever in South Wales during the summer of 1952.¹ The outbreak, which was confined to South Wales, lasted for five months and spread into four counties. About two-thirds of the 575 cases could be associated with some bakers' confectionery, and most of them with cakes containing synthetic cream. But immediate special inquiries into the synthetic cream showed that it could not be incriminated. It was made in England and distributed all over the country, and no other outbreaks were associated with it. Moreover, it was virtually sterile on arrival in Wales. When inoculated with paratyphoid bacilli the cream did not support the growth of the bacilli, though it was not actively bactericidal. Paratyphoid excretors were found on the staffs of four different bakeries, but the evidence suggests that they were the victims and not the originators of the outbreak. An examination of the sources of supplies of the bakeries which had sold infected cakes showed that flour was the only substance common to all the bakeries. This seemed a most unlikely substance to contain infection. On inquiry it was found that an ex-employee of the flour mills concerned, whose job was to fill the flour into sacks—one of the few persons in the mill who came into contact with flour—was a symptomless excretor, but he had left his employment before the outbreak started. Experiments then showed that paratyphoid bacilli remain viable for nearly a year in flour and multiply freely in slightly damp flour sacks. Flour

¹ *Ann. rheum. Dis.*, 1953, 12, 88.

² *Lancet*, 1953, 2, 15.

³ *Ann. rheum. Dis.*, 1953, 12, 95.

⁴ *Ibid.*, 1953, 12, 82.

⁵ *Lancet*, 1953, 1, 1227.

⁶ *J. Amer. med. Ass.*, 1952, 150, 1087.

⁷ *British Medical Journal*, 1952, 2, 1392.

⁸ *Lancet*, 1953, 1, 951.

¹ Thomson, S., *Monthly Bull. Minist. Hlth (Lond.)*, 1953, 12, 187.

had hitherto been an unsuspected source of infection, and, although conclusive proof was lacking that it did carry the paratyphoid bacilli into the bakeries, the experiments showed that this was possible. Bread or cake soaked in water are excellent culture media for paratyphoid bacilli, and cake containing cream is also an excellent medium.

A brief summary is also given of former outbreaks of paratyphoid fever caused by bakers' confectionery. In nine of these no excretor was found, in thirteen there was one excretor, and in five there were several excretors. Dr. Scott Thomson, the author of the report, suggests that in many of the outbreaks of paratyphoid fever the evidence incriminating the excretor in the bakehouse as the source of the infection is not very convincing.

MEDICAL NEEDS IN THE GOLD COAST

It has been an aim of medical administration in the British Colonies that the quality of medical care should not fall below the standards applied in Britain. In some Colonies there are too few doctors to cover the population adequately, and in those where there is a grave shortage some of the inhabitants cannot have their illnesses treated by qualified men. A demand therefore comes for official recognition of unqualified practitioners, on the false analogy that half a loaf is better than no bread. Elsewhere in this issue Mr. Ian Fraser, who visited the Gold Coast earlier this year at the request of the Council of the B.M.A., describes the precarious position of the medical services in that Colony, which now has a wide measure of self-government and is being quickly developed in other ways. Junior medical officers are required everywhere, and, as will be seen from Mr. Fraser's article, the shortage of specialists in a country which is already building a 510-bedded hospital is disastrous.

In the long run the Gold Coast's medical needs will be met by African doctors, and Mr. Fraser stresses the necessity for helping the African student and doctor to become well qualified. British medical schools can and do play an important part in training African doctors, but when the new hospitals are opened in the Gold Coast there is going to be a greater need than ever of specialists to undertake treatment and to train junior members of the staff. Where are these specialists to come from? Uncertainty about the period of time which will elapse before the Gold Coast government may feel it can dispense with British doctors causes concern to the medical officers already in the Colony, and is bound to affect recruitment adversely. But, as Mr. Fraser makes quite plain, the Gold Coast offers wonderful opportunities to medical men and women who are prepared to put up with the familiar disadvantages of life in the Tropics and the less well known problems of working for the government of a country subject to rapid economic and political change. Even so, most doctors contemplating service in the Gold Coast will want some assurance that they will not suddenly find themselves discarded. The B.M.A. is con-

sulting the Colonial Office on this matter, which bristles with administrative difficulties. It may be that an eventual solution will be found in the establishment of a Commonwealth Civil Service.¹

NOBEL LAUREATES IN MEDICINE

The Nobel Prize for Medicine and Physiology has been awarded jointly to Professor H. A. Krebs, F.R.S., of Sheffield University, and Professor F. A. Lipmann, of Harvard University, U.S.A. Both are distinguished biochemists who have carried out important studies on intermediary metabolism, and both are refugees from the tyranny that brought their native Germany to ruins.

In 1933 a Rockefeller grant enabled Dr. Krebs to come to Britain as a research student at Cambridge University. Two years later he moved to Sheffield under Sir Edward Mellanby, and in 1945 was promoted professor there and director of a Medical Research Council unit for research in cell metabolism. In 1947 he was elected F.R.S.

According to the official citation Professor Krebs receives his award in recognition of his discovery of the citric acid cycle in the metabolism of carbohydrates—now commonly called the Krebs cycle. In his crucial experiments pyruvic acid, which is formed in the earlier stages of carbohydrate metabolism, was mixed with oxaloacetic acid and was incubated with minced muscle in the absence of air. Citric acid was formed, with the elimination of carbon dioxide. Further losses of carbon dioxide produced α -ketoglutaric acid and succinic acid, and the cycle was then completed through fumaric and malic acids back to oxaloacetic acid, which was ready to combine with more pyruvic acid. In tracing the course of this cycle Krebs was not breaking entirely new ground, but he has solved problems which had long puzzled many workers in a crowded field of research, and he has illuminated what had previously been a maze of obscurities. During the war Krebs showed his abilities in other directions. On the resignation of Dr. Kenneth Mellanby from the Sorby Research Institute he took over the care of a group of conscientious objectors who helped in experiments on vitamin deficiencies for the M.R.C. His enthusiasm helped to sustain the volunteers through the boredom of subsisting through long periods on monotonous diets.

Professor Lipmann receives his part of the prize for his work on co-enzyme A. This factor, which is concerned with the metabolism of two-carbon fragments, plays a part in metabolic processes which are related to the Krebs cycle. The two discoveries for which the award has been shared, however, may be considered as independent in their origin. It was in 1939 that Lipmann was obliged to leave Germany because of Nazi persecution, and he arrived without funds in the U.S.A. A place was found for him at the Massachusetts General Hospital, and in 1941 he became head of the biochemical research laboratory. In 1951 he was appointed professor of biological chemistry at Harvard Medical School.

CLINICAL PATHOLOGY IN GENERAL PRACTICE PLEURAL, PERICARDIAL, AND PERITONEAL TAP

BY

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Chief Clinical Assistant to the Brompton Hospital, London

Laboratory examination of serous effusions is a valuable adjunct to clinical diagnosis. The interpretation of the pathological changes in these fluids will be described later in this series. The present article is concerned only with the methods of obtaining specimens for examination. The technique of diagnostic pleural tap is described in detail, since this procedure is the one most often called for in practice. Pericardial tap, which is seldom indicated, and peritoneal tap, which is less informative, are described more broadly, some of the detail previously described being assumed.

Pleural Tap

Aspiration of pleural fluid for diagnostic purposes is an easy and safe procedure. It should, however, be carried out only when the diagnosis of pleural effusion has been

made with confidence, the diagnosis preferably having been confirmed radiologically. It should not be used blindly to discover whether fluid is present or not. Serious complications often follow the insertion of a needle into hydatid cysts, lung abscesses, and other intrathoracic lesions which might simulate pleural effusion on clinical examination. Whenever doubt exists recourse should be made to accurate radiological diagnosis by postero-anterior and lateral films before aspiration is done.

Apparatus.—Only the simplest instruments are required, and the following should suffice: a 2-ml. syringe; a hypodermic needle, size 17 (B.W.G. 25); a hypodermic needle, size 1 (B.W.G. 21); a 20-ml. syringe; a wide-bore chest-aspiration needle (B.W.G. 16) to fit the 20-ml. syringe; sterile containers; sterile 2% procaine; swabs; gallipots; sterile towel; cetrimide and surgical spirit or iodine; and surgical tape or collodion. The needles should fit the syringe nozzles exactly. The connexions must be airtight. The wide-bore aspiration needle should be thick enough to allow withdrawal of pus should this be encountered.

Preparation of Patient.—Diagnostic tap is an almost painless operation and usually no premedication is required, but a patient who is unduly anxious or who has a persistent cough should have $\frac{1}{4}$ gr. (16 mg.) of morphine half an hour beforehand. He should be placed in a posture which is comfortable to himself and convenient to the physician. A patient who is well enough may sit forward in bed with the knees flexed, the arms folded in front with the elbows resting on the knees and the head resting on the forearms (Fig. 1). The legs should be freed from the weight of the bedclothes to allow the knees to bend, since it is uncomfortable to lean forward with the knees straight. A patient who is not so well should be propped forward on a bed-rest or supported at the shoulders by an assistant.

Site of Aspiration.—In large effusions the best site for aspiration is in the ninth intercostal space in the posterior axillary line. The tip of the scapula, which lies over the seventh rib, is the most useful landmark in finding the right intercostal space. In smaller or localized effusions the needle should be inserted over the area of maximal dullness to percussion, but in such cases radiological location of the effusion should be carried out whenever possible. Lateral radiographs often show that an effusion is localized in the posterior part of the thorax in the paravertebral gutter, and in such cases aspiration should be carried out near the vertebral border. The radiographs of a patient with a posterior pleural effusion are shown in Fig. 2. It is clear that exploration in the posterior axillary line in such a patient would be fruitless, since the needle would pass in front of the effusion.

Technique of Pleural Tap

A wide area of skin around the site of operation is cleaned with cetrimide and iodine or surgical spirit. The 2-ml. syringe is then filled with 2% procaine and, using the size 17 hypodermic needle, a small bleb is made under the skin at the elected site of aspiration. The needle is then withdrawn, removed from the syringe, and replaced by the size 1 needle. After waiting about two minutes for the local analgesic to take effect



FIG. 1.—Position for pleural tap.

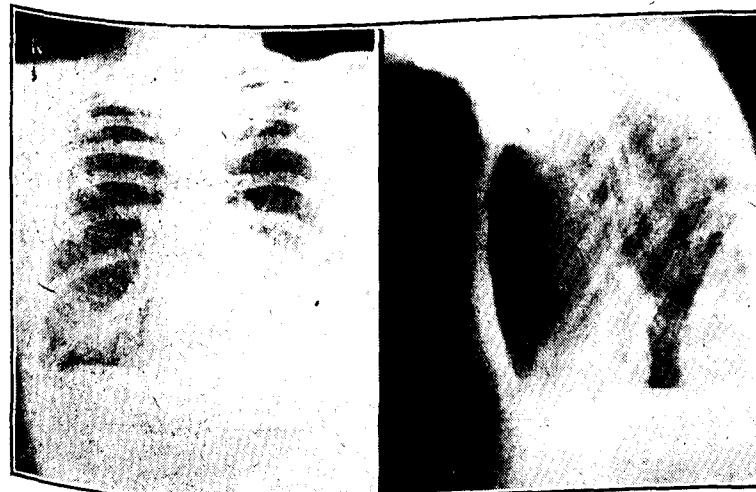


FIG. 2.—Radiographs of patient with posterior pleural effusion.

¹ The Times, September 7 and 8, 1953.

the deeper tissues are anaesthetized by injecting 2% procaine through the size 1 needle, which is advanced slowly until it is felt to pierce the parietal pleura. Not more than 2 ml. of procaine is required for this. The needle is then withdrawn and a further few minutes allowed for full analgesia to develop. The wide-bore needle is then attached firmly to the 20-ml. syringe, and the syringe tested by making sure the plunger moves freely up and down the barrel. With the syringe held firmly, the aspiration needle is pushed slowly but steadily through the intercostal space. During this procedure it is often helpful to rest the forefinger of the operating hand against the chest wall and to rest the flexed middle finger half-way down the needle (Fig. 3). This guards against the needle being thrust too deeply into the thorax when the skin resistance is suddenly overcome. A distinct "give" is felt when the needle pierces the pleura. The plunger of the syringe is then pulled back and the syringe filled with 20 ml. of pleural fluid. The aspiration needle is then withdrawn from the chest wall, and a small piece of gauze or wool is placed over the needle-hole with the other hand.

The pleural fluid is immediately transferred to the sterile specimen bottle before the fluid has time to clot. A small dressing is applied to the chest over the site of aspiration by means of adhesive tape or collodion. The specimen is labelled and dispatched without delay. Difficulty is seldom encountered except when there is a grossly thickened pleura or sometimes when the pleural space contains blood clot or thick pus. If fluid is not obtained easily the needle should be withdrawn and not be pushed forward aimlessly into the chest, since this entails risk of complications. The usual causes of difficulty are faulty choice of site or mistaken diagnosis. Failure to withdraw fluid should lead to

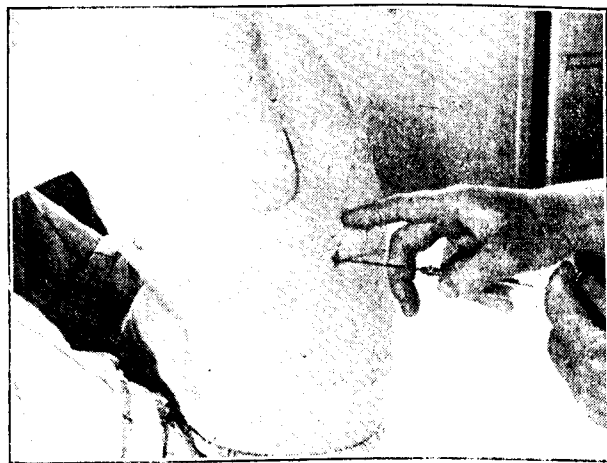


FIG. 3.—Introduction of the aspiration needle.

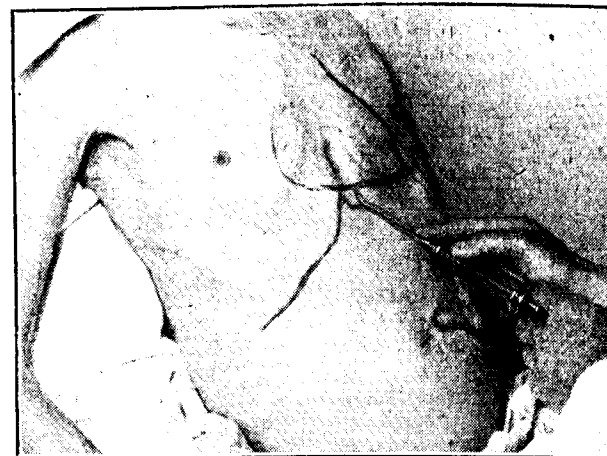


FIG. 4.—Pericardial tap.

careful reconsideration of these simple matters and not to adventurous blind exploits into the thorax. Performed in this way pleural tap carries little or no risk. Pleural shock is never encountered. Care should always be taken to avoid introducing air into the pleura.

Pericardial Tap

Although large pericardial effusions may be easy to diagnose and safe to aspirate, small effusions are extremely difficult to recognize with certainty and their aspiration is fraught with difficulty. Even with full radiological and cardiographical facilities small pericardial effusions may be difficult to differentiate from cardiac enlargement. Diagnostic pericardial tap is therefore of very limited application in general practice.

Pericardial effusions may be aspirated from in front by inserting a needle through the chest wall, or from below by approaching the pericardium from the costal angle. The second method is preferable because it gives access to the most dependent part of the pericardial sac, where small effusions first gravitate, and also because it is free from the risks of injuring and infecting the pleura, to which the anterior approach is particularly prone. The subcostal approach, which is both easier and safer, should be the method of choice.

With the patient sitting upright and propped comfortably on pillows the gap between the xiphoid process and the left costal margin is palpated, and the skin in this area infiltrated with 2% procaine. The deeper structures are then anaesthetized. A wide-bore needle with a sharp edge but a blunt bevel is securely attached to the 20-ml. syringe, and the pericardium is explored by pushing the needle steadily and firmly from the left subcostal angle. The needle is directed upwards and backwards and slightly towards the midline (Fig. 4). As the pericardium is entered a sudden fall of resistance is felt. Then 20 ml. of pericardial fluid is withdrawn and transferred to a sterile container. The risk of injuring the heart muscle in pericardial tap has often been exaggerated. If the needle is pushed too far a distinct grating can be felt as soon as the needle-point touches the contracting heart muscle. If the needle is withdrawn slightly when this is felt, no damage will be done. Even with greatly dilated hearts, where confusion with pericardial effusions is most likely to arise, it is easy to feel when the heart wall is touched, and the danger of rupturing or penetrating the heart wall is extremely remote.

Peritoneal Tap

Aspiration of ascitic fluid for diagnostic purposes is not commonly practised, since the information gained thereby is seldom of much help in clinical diagnosis. Physical examination is of paramount value in diagnosing the cause of ascites. If, however, peritoneal fluid is required for examination it can readily be obtained by inserting a needle through the abdominal wall. Before aspiration is attempted, two fundamental precautions must be observed. First, it is essential that the patient's bladder should be empty, and to avoid any risk of injuring the bladder-wall it is safer to catheterize the patient. Secondly, in the female a pelvic examination should be done to exclude as fully as possible the alternative diagnosis of ovarian cyst, which so often resembles ascites.

The best site for aspiration is a point midway between the umbilicus and the anterior superior spine of the ileum. When this point is found, the skin and deep structures are anaesthetized with 2% procaine. A wide-bore needle attached to the 20-ml. syringe is then plunged firmly through the abdominal wall and 20 ml. of fluid withdrawn and transferred to a sterile container.

Next Article on Clinical Pathology.—"Lumbar Puncture," by Dr. William Gooddy.

SHORTAGE OF MEDICAL OFFICERS IN THE GOLD COAST

BY

IAN FRASER, D.S.O., O.B.E., M.D., M.Ch., F.R.C.S.

Earlier this year Mr. Fraser visited the Gold Coast at the request of the Council of the B.M.A., which had been considering the desirability of forming a Gold Coast Branch. In this article he describes the medical problems of the colony.

The present shortage of medical officers in the Gold Coast is causing anxiety, both in the colony itself and at home. There is a shortage of men in all branches of medical practice—shortage of medical officers for out-stations and for the medical field units, and shortage of specialists. These posts have in the past been filled partly by Africans trained in the medical schools in the United Kingdom, and the cost of this has been borne mostly by the Gold Coast Government, with the understanding that when qualified they would return either as junior medical officers, or, possessing higher qualifications, to fill some of the many specialist posts available. The result has been a little disappointing. Some of the men who have qualified in the United Kingdom have decided to stay here. Others have returned to the Gold Coast, but have soon left the service to take up the more lucrative private practice; and so the colony as a whole has not benefited to the extent that was hoped for. Very few have become specialists, because few of the senior specialists have the time or the facilities to introduce the young men returning to the colony to more advanced surgery or medicine, and so give them the basic training in a specialty that would later require only a short postgraduate course in the United Kingdom to enable them to obtain a higher degree.

Help in Qualification

Since 1948, with an increase in trainee specialists in the United Kingdom, as many as 400 candidates at a time may have attempted to pass higher examinations like the F.R.C.S. and M.R.C.P., with the possibility of 40 to 50 of them getting through. Obviously the chances of passing for young medical officers trained in the colony were diminished in the face of such stiff competition, though this state of affairs may be passing off now. I feel that something must be done to help the African student and doctor to become well qualified. There should be no question of lowering standards, but facilities should be improved. In England the facilities remain constant and are always available; but they are expensive and demand time. Therefore teaching in the colony itself must improve, and this means more teachers and more specialists, and hospitals which cater for a wider range of specialties.

The average hospital in the colony to-day consists of surgical wards, medical wards, a maternity ward, and a children's ward. The medical staff varies in quantity and quality. In some instances there may be only one medical officer capable of doing routine surgery, and he may be also responsible for dealing with gynaecology and complicated midwifery. The average list includes such cases as hernia, hydrocele, trauma, sepsis, ectopic pregnancy, hysterectomy, etc., and one surgeon has just completed a series of 150 operations for vesico-vaginal fistula. Another, a young African, had performed 97 caesarean sections within a few months. In one area two extrauterine pregnancies have to be dealt with every week. It will thus be seen that there is ample opportunity for practical experience.

The European or expatriate doctor starts at an advantage. He has found the examination in the United Kingdom easier and begins at a younger age. It is also easier for him to return on study leave and work for higher

qualifications. Therefore up to now the majority of the specialist posts have been filled by expatriates. Even so, there have always been too few of them; they have been so busy with routine work that teaching and organization of a department have been impossible, and, with the shortage of junior staff, no young doctor is left long enough in a potential teaching centre to get trained. After a brief stay he is hurried off to a district station where the need for his services is great; once there, his chances of specialization are increasingly difficult.

The expatriate specialist becomes more valuable to the colony the longer he stays there. He may in time have to maintain a home in the United Kingdom so that his children may be educated there; and this is costly. With the increased cost of living in the Gold Coast, these senior medical officers and specialists are finding their salaries insufficient, and many are tending to leave the service. It is most important something should be done to halt this tendency, and immediate replacement must be found when they do go.

In the next ten years the Gold Coast will experience one of the most interesting and dramatic expansions in its history. Money is being spent lavishly in many necessary projects—a new town, a new harbour, the Volta scheme, a new university, and a new hospital costing £5,000,000 for its 510 beds. These and other schemes will cost in the region of £144,000,000. This gives some idea of the expansion. Yet at the moment there are three surgeons for 4,500,000 people, one gynaecologist, no eye specialist, no ear, nose, and throat specialist, no dermatologist, no tuberculosis specialist (tuberculosis is very prevalent), no anaesthetist, no paediatrician, no orthopaedic specialist (yet injury is becoming increasingly more frequent, and will become still more so with the new mechanization). Yet at home here in Britain there are some 60 to 70 candidates for every hospital appointment; at a recent appointment there were two applicants—specialists—actually drawing unemployment benefit. What a contrast! And what wasted opportunity!

In a letter to the *Lancet* of April 11 this year a registrar wrote this: "There must be many hundreds of us throughout the country, growing yearly more hopeless, a stagnant pool of cheap specialists, deliberately created by the National Health Service. A great many of us have been qualified for ten to fourteen years, but we are paid less than a newly settled general practitioner. We are liable to dismissal at short notice and at regular intervals. We can settle nowhere and we can plan nothing. It is obvious that we cannot all become consultants overnight." But there are parts of the world where opportunities and vacancies are waiting, and the Gold Coast offers these to-day. Though one may sympathize with these young men it is difficult to understand the attitude of those who would rather do nothing and starve at home than go abroad and practise real medicine, with unrivalled opportunities for experience.

The man willing to do this must be of the right type; his integrity must be beyond question; he must be able to improvise, to turn his hand to anything. As a surgeon he may in the course of an afternoon have to remove a ruptured spleen, deal with an ectopic pregnancy, sew up or amputate a leg bitten by a crocodile, and perhaps repair a deep stab wound. An elephantiasis of the scrotum touching the ground may be thrown in for good measure. If he has a wife with the pioneering spirit—one who is a good companion as well as a wife—he will be doubly fortunate.

Reasons for the Shortage

Why are not enough British doctors going to places like the Gold Coast? One reason is that Africanization is going to exclude them from some of the higher positions. Certainly this will happen in time, but at the moment the question does not arise. It will be long before there are enough senior Africans of experience to take all the jobs in the various specialties and also fill the higher adminis-

trative posts. The obvious need in the Gold Coast is to increase the number of specialist posts and fill them with people of integrity and ability, with the skill to teach the younger generation and so build up a lasting service—the specialist at the top, the medical officers below, in training to become specialists, and dispensers, sisters, nurses, etc., all trained to a higher level. The standard of work in hospitals will rise, and the hospitals become recognized as suitable for the training of medical students. Only when all this happens should the Gold Coast consider forming a medical faculty. Certain back-benchers, with little knowledge of facts, may press for the early formation of such a faculty. It would be just as valuable as a Rolls-Royce car with no one able to drive it properly.

In the Gold Coast, therefore, the specialist service is priority No. 1. In the United Kingdom the men are available, but the colony must make the conditions attractive. In every country there is always the difficulty of paying for one service more than for another. Why should the doctor get more than the engineer? It is clear, I think, that he should. He spends himself more, his daily responsibilities are greater, he gives a 24-hour service, and he is doing more than curing an individual life—he is making a permanent service.

As I have pointed out, when the specialist is at an age to give his best to the colony his home commitments are unfortunately at their heaviest, and often that is the stage when he retires, as many are threatening to do at the moment. Some attraction must be offered these men, especially during the next ten years. If the present service deteriorates further it will be difficult to build it up again with new people. Better pay and some security of tenure, or compensation, would attract better men and women.

Appointments Available

The appointments in the Gold Coast are very varied: a medical officer of health to a port authority; a doctor to a bauxite mine, a diamond mine, or a gold mine; a specialist in every branch of medicine; a practitioner in a town; a practitioner in a country station; or, best of all, a bush doctor, with a shot-gun and the midwifery forceps both kept at the "ready" in the back seat of the car. At the moment there are many attractive short-time contracts whereby one can see the country. Having recently revisited the colony after an absence of ten years, I found that in the interval progress has been equivalent to that of 50 years at home.

But the shortage of doctors is being made good in a makeshift manner. Many areas are without a qualified doctor, and dispensers and dressers are doing the work, with perhaps a call every few weeks from the medical officer at the nearest station. This is a sad state of affairs. It is bad medicine and is dangerous: it is putting power into the hands of untrained and sometimes unscrupulous, greedy people. It is hard to be critical, as the gaps have to be filled. Some are allowed to practise with degrees of doubtful validity, and, finally, there is a tendency for the foreign doctor to infiltrate—Poles, Swiss, Germans, some stateless. One is not in a position in all cases to criticize their medical ability, but most of them have not the same interest in the Gold Coast as has the British doctor, with his long connexion with the colony: the interest of the former in the colony is that it affords a good living, but they give little in return in the way of teaching or in building up a service.

Conclusion

The next few years will be critical. The future of the medical service of the colony will depend upon whom we send out. The present service, its link with teaching, and its improvement in hospital work, will make up the foundation of the medical school. With the eventual formation of a medical school real Africanization of the service can be envisaged. Till then, promotion, if it is to be fair and if the appointments are to carry respect, must be made through merit and experience, and by no other way.

NOBEL PRIZE



(Walter Stoneman, London)

Professor H. A. Krebs, director of the Medical Research Council's Cell Metabolism Unit at Sheffield, who has been awarded the Nobel Prize for Medicine jointly with Professor F. A. Lipmann, of Harvard (see p. 984).

SEVENTH INTERNATIONAL PAEDIATRIC CONGRESS

[FROM A SPECIAL CORRESPONDENT]

The Seventh International Paediatric Congress was held in Havana from October 12 to 17 under the presidency of Professor Felix Hurtado. The opening ceremony was performed in the House of Representatives in the beautiful National Capitol Building on Columbus Day by President Batista, who gave a moving address on the need for child care. The British delegation of twelve was led by Dr. Bernard Schlesinger, President of the British Paediatric Association; Professor Alan Moncrieff represented H.M. Government. Nearly 50 countries were represented, and altogether nearly 2,000 registrations were made.

Epilepsy in Childhood

The first plenary session was devoted to epilepsy in infancy and childhood. Professor C. H. ALSTRÖM (Sweden) dealt with genetic problems, stressing the fact that acquired causes were more important than heredity factors. He emphasized that the risks in marriage as regards transmitting epilepsy were of the same order as for the majority of the population, provided that the affected parent was of normal mentality. Professor I. McQUARRIE (U.S.A.) traced the story of water balance in relation to epilepsy from the discovery that dehydration reduced the number of fits, to the modern use of deoxycortone acetate as an adjuvant to drug therapy. Professor M. A. PERLSTEIN (U.S.A.), in a review of drug treatment, gave much wise advice. There was "more to it" than drugs in treating epilepsy. It was better

to have convulsions and be normal in between than to walk about in a state of coma. It was clinical cure that was sought, not a completely normal E.E.G. tracing. Any new drug given with enthusiasm would help for a time, and caution was advised in accepting claims for new drugs. Nevertheless, it was important to try everything and use the drug that worked best. Professor W. LENNOX (U.S.A.) looked back over a long experience and pleaded for a better attitude to epilepsy as a public health problem. The first step was to remove all fear of the disease. Professor F. ESCARDO (Argentina) discussed certain unusual forms of epilepsy, and Dr. J. PICAZA (Cuba) surgical treatment.

A special evening session on social problems in paediatrics concluded the first day. Professor R. DEBRÉ (France) discussed international aspects in an account of the origin and present-day work of Unicef, which had recently had its mandate renewed by U.N.O. for an indefinite period. He was followed by Dr. E. MOURE (Cuba), who gave a wide review of the social work done for children in her country, with many challenging conceptions of the rights of the child, which the chairman—Dr. M. WEGMAN (U.S.A.—Regional Office of W.H.O. in Washington)—thought might not altogether gain acceptance "in a country a little further north." Dr. R. VALDÉS DIAZ (Cuba) described the work of the National Organization of Children's Dispensaries. Dr. S. FARRER (U.S.A.) spoke about the ideals of paediatrics which might be achieved in a children's hospital. Dr. R. DEL CASTILLO (Cuba) on rehabilitation of the paralysed child, and Dr. P. DANIEL MARTINEZ (Mexico) on maternity and child welfare in relation to health.

Congenital Heart Disease

The second plenary session, on congenital heart disease, was presided over by Professor A. CASTELLANOS (Cuba), who has done so much original work in this field. Dr. J. LIND (Sweden) dealt with technical advances in diagnosis, particularly with modern angiocardiology with simultaneous E.C.G. markings on the film. He gave a stern warning about the dangers of too much radiation in the investigation of small infants. Professor I. CHAVEZ (Mexico) then dealt with acyanotic heart disease—especially coarctation of the aorta and patent ductus arteriosus, followed by Professor R. KREUTZER (Argentina) on unusual types of pulmonary stenosis, a subject also dealt with more briefly in a subsequent contribution by Professor B. GASSUL (U.S.A.). Professor S. GIBSON (U.S.A.) brought the audience back to the bedside with an excellent account of the use of "eyes, ears, and hands" in the diagnosis of congenital heart disease, and Dr. HELEN TAUSSIG (U.S.A.), from her wide experience, discussed the results of operative treatment.

Prematurity

The third plenary session tackled some of the problems of premature infants. Professor A. YLPPÖ (Finland) surveyed the subject with special reference to his own country. There, as a contribution to the preventive side, every expectant mother must attend for antenatal care not later than the fourth month or she forfeits maternity benefit. Among measures for the care of the prematurely born he favoured gastric oxygen, early administration of fluid, and breast milk from the second day. He was pessimistic about reducing mortality below 20%. Professor H. HUNGERLAND (Germany), after remarking that modern methods of feeding premature babies did not differ much from those recommended by the older German authorities, went on to review in some detail problems of nutrition and metabolism. Professor M. LAMY (France) presented a paper for Professor M. LELONG on an interesting group of cases of retrolental fibroplasia in which partial regression had occurred. Professor C. SMITH (U.S.A.) surveyed the question of the importance of the respiratory system after premature birth, pointing out that many premature infants ventilate their lungs better soon after birth than a few hours later. Boston Lying-in Hospital had obtained a mortality rate among the premature infants of only 14.5% in 1950. Professor J.

OBES-POLLERI (Uruguay) suggested that, whereas post-natal care had very greatly improved, pre-natal problems and what he termed the "crisis of birth" still merited more attention. Professor A. MONCRIEFF (Great Britain) spoke of his twenty years' experience since getting on the staff of Queen Charlotte's Hospital. He pointed out that the percentage survival rate (to 28 days) of premature babies born at home in England and Wales in 1950 had been 86%, which made the results 0.5% better than the ideal conditions in hospital in Boston. He also showed how the deaths under 4 weeks for 1,000 live births ascribed to prematurity had fallen from 16 in 1931 to 5.6 in 1951. Professor B. VAHLQUIST (Sweden) discussed work on the causation of anaemia in premature infants, stressing that infection was no longer an important factor, and that inherent differences existed between the red cells in prematurity and in mature babies and later infancy. Dr. L. TORRES BARBOSA (Brazil) concluded with an account of official measures used for the care of premature babies in his country.

Complications of Primary Tuberculosis

The fourth plenary session dealt with the complications of primary tuberculosis. Professor A. WALLGREN (Sweden) first reviewed the ordinary course of primary infection, taking the skin as the simplest site to study this. He classified complications under local disease and systemic disease. Under the former heading came extension of the tuberculous lesion and the part played by secondary bacterial infection of a non-specific type. The systemic spread mainly meant meningitis, about which several subsequent speakers gave their experiences. Dr. EDITH LINCOLN (U.S.A.) discussed a group of nearly 1,000 cases of primary infection seen at the Bellevue Hospital, New York City. A mortality of 21.5% in the period 1930-46 was reduced to 4.5% when streptomycin and adjuvant drugs came in, and to 1.4% with the advent of isonicotinic hydrazide. With this last drug the use of intrathecal streptomycin had been practically eliminated. Professor R. DEBRÉ (France) was, on the contrary, not at all happy about the present tendency to omit intrathecal therapy. He stressed the prognostic importance of the state of consciousness on admission together with electroencephalographic examinations. He also stressed the great improvement with isonicotinic hydrazide. A paper from Professor C. COCCHI (Italy) (read on his behalf) also stressed the need for intrathecal treatment, although with modern adjuvants smaller doses would probably be used. Dr. B. SCHLESINGER (Great Britain) presented a study of over 400 children with primary tuberculosis followed at Great Ormond Street from 1945 to 1953 with a total mortality of 14%. He stressed that with good home conditions a large group could be treated and supervised as out-patients. Bronchoscopy had proved of limited value. Lobectomy in a small number (7) of patients indicated that more use might be made of this form of radical treatment in selected cases. Dr. A. SCROGGIE (Chile) described chronic massive lung collapse as one of the troublesome complications.

Metabolism and Nutrition

The last plenary session was a mixture of communications on various aspects of metabolic and nutritional disorders. Professor P. GYORGY (U.S.A.) described the discovery of a new "growth factor" in human milk. The first step had been the finding of a specific variant of *Lactobacillus bifidus* (from the stools of a breast-fed infant) which required this specific factor for growth. On studying the factor it was found to be present in forty times the concentration in human milk as compared with cow's milk. This new factor was different from all the known vitamins and growth factors. In concentrated form it had been shown to stimulate the growth of young rats and to have an inhibitory effect on the growth of certain viruses. Professor G. FANCONI (Switzerland) discussed the part played by the kidney in regulating chemical metabolism and gave a fascinating account of the clinical significance of the functions of the proximal and distal tubules. Professor D. DARROW

(U.S.A.) talked on the treatment of infantile diarrhoea, stressing that this was still a major cause of death in many parts of the world, and children who died did so because of chemical disturbances. He outlined the fundamental changes in water and electrolytes, and from this deduced a logical plan for treatment. Professor E. HOLT (U.S.A.) thought that great caution should be exercised before accepting the implications suggested by Gyorgy's paper. He thought its clinical importance had still to be proved, and he put up a spirited defence of the cow. His communication dealt with the findings that both in healthy and in diseased states the absorption of foodstuffs could be increased by an increased intake. Professor R. RAMOS (Spain) added electroencephalographic changes to the list of disturbances suffered by infants with diarrhoea. He stressed especially the need to restore the blood volume to normal. Professor G. FRONTALI (Italy) spoke of nutritional oedema and protein deficiency as studied in his country, and Professor F. GÓMEZ (Mexico) gave data on the cure of so-called deficiency complications of diarrhoea and severe malnutrition without the use of commercial vitamin preparations.

In addition to the main sessions there were nearly 30 "round tables" for discussions on selected subjects, several "free sessions" for communications not on the main chosen themes, and a "grand forum," where questions were answered by an impressive panel. The scientific exhibition was of a high quality. The congress concluded with a banquet, and, as with most of the social events, it was colourful and lively. The next international paediatric congress is planned for 1956 in Copenhagen.

INSTITUTE OF CLINICAL RESEARCH NEW FACILITIES AT THE MIDDLESEX

An Institute of Clinical Research and Experimental Medicine in association with Middlesex Hospital Medical School was opened at an informal gathering on October 22, when the staff of the hospital and school and a number of distinguished visitors attended a reception given by the chairman of the hospital, Colonel J. J. Astor. The Institute is housed in a large building of four stories in Hanson Street, a few minutes' walk from the hospital, and is furnished and equipped on the most generous modern scale.

The new Institute takes its place alongside the existing institutes and departments associated with the Middlesex—the Bland-Sutton Institute of Pathology, the Courtauld Institute of Biochemistry, and the Barnato Joel Laboratories of Physics. Its purpose is to provide the consultants of the hospital with research facilities for their exclusive use, and it is said to be the first such provision made by a British hospital for its clinicians. A clinical research committee is responsible for its control and also for reviewing applications for grants. Any member of the consulting staff of the Middlesex is entitled to put forward or sponsor a project for research, and the committee, if it accepts the application, may allocate—for a limited time in the first instance—either money or space, equipment, and facilities in the building. To maintain the high technical standards for a comprehensive institute of this description, liaison is maintained with the existing medical school departments, and, in addition to the technicians in charge of the pathological laboratory, the biochemistry laboratories, and the workshop, there are attached as advisory technicians those who are at the head of the technical staff of the Bland-Sutton Institute, the Courtauld Institute, and the Barnato Joel Laboratories respectively.

Endowment Funds Freed

This handsome provision has been made possible by the freeing of the endowment funds which the Middlesex, like many other hospitals, had in its possession when the National Health Service Act came in. The suggestion was made that part of the income from such funds should be spent on medical research, and on a proposal from the medical

committee the board of governors decided to allocate approximately two-thirds of the available money to projects falling under the head of clinical research. It became evident at once, however, that if the money was to be wisely and economically used space and facilities must be provided for clinicians desiring to carry out such work. In 1949 accordingly the present building, originally a boys' club, which had been erected ten years before, was purchased and structurally adapted to this new purpose. Altogether well over £100,000 has been spent on the purchase and conversion of the building and its equipment. The director of the Institute is Professor A. Kekwick.

A Tour of the Building

The main laboratory provision is on the second floor, where there is a large pathological laboratory, two biochemical laboratories, a workshop, and a small isotope room. Measuring and testing instruments, some of them familiar and some less so, were laid out on the benches for the inspection of the visitors—a photoelectric absorptiometer, a flame photometer, oscillographs, an electronic testmeter, freezing and base-sledge micrometers, microscopes, and the like, and in the workshop precision lathes and many other devices. On the first floor are five small individual laboratories, also library, reading, and record rooms, and administrative offices, as well as a large conference hall.

The ground floor provides six consulting-rooms of different types and sizes. The largest of these has six examination couches, with screens, trolleys, and all facilities. They are furnished rather more comfortably than the usual hospital consulting-room, because the patients for whom they will be used, whether from the hospital or privately, will be those who have volunteered for the research, and it is felt that they are entitled to a certain extra degree of comfort. There are also on this floor a nurses' room and a waiting-room.

The top floor has been assigned for work on animals. Here there are two air-conditioned animal houses, a preparation room and operation theatre with a recovery cubicle, and an isolation house. Above the animal houses is a large extent of flat roof wired in to allow open-air runs for the animals. In the basement is an x-ray set with a generator, to which other equipment can be added if necessary.

Among the projects already in view or started is an investigation of cancer of the lung and its causes; another is the tracing of the growth of bone by means of radioactive isotopes; and a third the development of a synthetic bone for grafting when the natural bone has been destroyed by disease. New drugs for use in breast cancer will be tested, and another investigation concerns the movement of bacteria in the nose in colds and other catarrhal conditions.

THE CARE OF MENTAL DEFECTIVES

MINISTER OF HEALTH AT FOUNTAIN HOSPITAL

The Fountain Hospital at Tooting Grove, London, which accommodates nearly 600 mentally defective children mainly of the idiot and imbecile grades, was visited by the Minister of Health, Mr. Iain Macleod, on October 23 on the occasion of its sixtieth anniversary. The institution began as a temporary fever hospital, and not until 191 was it devoted to its present purpose by the Metropolitan Asylums Board. It was taken over by the London County Council in 1929, and transferred to the South-west Metropolitan Regional Hospital Board in 1948. The children at work and play, were inspected by the visitors attending the celebration, and the results of their handicrafts were shown.

Mr. Macleod said that when it became possible a month or two ago to allocate an extra two million pounds to capital expenditure in the National Health Service he arranged that one million of that sum should be devoted to the mental health side of the Service. This had been

done with the full sympathy and consent of Mr. Butler, the Chancellor of the Exchequer, who was himself President of the National Association for Mental Health. It was important that the mental health services should be brought more closely into line with the rest of the Health Service so that people would not think that mental disease was something to be shunned and forgotten.

The Royal Commission

The newly announced appointment of a Royal Commission on mental illness and mental deficiency was a matter of great moment (see p. 998). Much of the law in these fields was out of date and out of tune with modern thought. One of the problems needing examination before any new legislation was whether the voluntary method of entering mental homes and hospitals should be extended, and whether there should be a much less formal entry into mental deficiency institutions. It was interesting to note that 70% of those who entered mental hospitals to-day did so as voluntary patients and that 40% even of those who entered as certified patients recovered within the first year of their certification. "Although many of our buildings are out of date," the Minister added, "I have no doubt at all that our treatment in the mental health field leads the world." Another matter which would doubtless be considered by the Royal Commission was the definition of mental deficiency.

Referring to the building of new hospitals, the Minister said that next spring he was to lay the foundation stone of the first new hospital to be built since 1939, and this was to be a large mental deficiency colony in the Liverpool region, where there was at the present moment desperate overcrowding and shortage of accommodation. He ended overcongratulating the Fountain Group Hospital particularly on the success it had achieved in nurse recruitment and on its research work. "There may be tragically little that can be done for many of the children here, but through research we may in time be able to prevent children suffering from mental deficiency."

Reports of Societies

POLIOMYELITIS IN COPENHAGEN

The Danish experiences during the 1952 epidemic of poliomyelitis were described at a joint meeting of the Epidemiology Section of the Royal Society of Medicine and the Fever Group of the Society of Medical Officers of Health which was held at the Royal Society of Medicine on October 16. Professor A. BRADFORD HILL was in the chair.

Epidemiology

Professor H. C. A. LASSEN explained that Copenhagen was a city with about 1,200,000 inhabitants with one large fever hospital, the Blegdams, which had 500 beds. During the period of the epidemic over 3,000 patients were treated. The experience was peculiar for a European epidemic in that about one-third of the paralysed cases showed respiratory involvement. At the height of the epidemic an average of 10 patients a day were admitted with severe impairment of ventilation, requiring as a rule urgent treatment. There were still to-day over 25 patients remaining from the epidemic who were receiving artificial respiration.

At the beginning of the outbreak it had been intended to carry out a full epidemiological investigation, but the numbers were so great that it became necessary to restrict the study to 300 cases, representing every seventh case in chronological order. A group of 300 controls of similar age, sex, and town district was used for comparison. Many points had been chosen for special examination, but attention was drawn to two interesting findings. In the poliomyelitis group 28.2% had been in contact with another

case of poliomyelitis and 33.5% gave a history of contact with minor illness, usually of a respiratory character. In the control group the equivalent figures were 4.1 and 5.7% respectively. Although the possibility of an association with head trauma, vaccination, intramuscular injections, and pregnancy had been examined the differences between the "sick" and the control groups were not significant.

The Cases With Respiratory Paralysis

At the outset of the epidemic the number of tank respirators was insufficient, and even when these were supplemented by loan it soon became clear that the use of the tank respirator in cases with pooling of secretions in the pharynx was fraught with great danger. The assessment of such cases was usually extremely difficult, and it was often impossible to decide which signs were due to virus damage and which were due to secondary changes. After the elaboration of the positive-pressure ventilation method* the results had steadily improved, and in succeeding groups of 50 patients the following percentage fatality rates were obtained: 87, 54, 50, 40, 26, 36, and 22. For the 345 cases the over-all fatality rate was 41%.

Attention was drawn to the prognostic value of certain signs, and the most important of these are shown in the following table:

	Frequency %	Fatality Rate %
Shock	39	67
Ileus	33	43
Hyperpyrexia	19	91
Hypertension	19	42
Azotaemia	22	78
Pulmonary oedema	8	93

It was apparent that sex was of some significance, for the fatality rate in men was 49% as against 29% in women.

Dr. J. R. IBSEN described vividly his introduction to the first patient treated, who was a girl of 12 years with paralysis of all four limbs, a developed atelectasis, extremely distressed, cyanosed, and sweating. Despite the immediate problems associated with the introduction of a new method, the establishment of a clear airway with adequate ventilation resulted in almost immediate relief, disappearance of cyanosis, and fall in blood pressure. An x-ray picture showed that the atelectasis had re-expanded. Thereafter a "standard" technique was gradually evolved in which a preliminary period of observation with adequate postural drainage was followed, when necessary, by positive-pressure ventilation through a laryngeal tube. The tracheotomy—which was usually through the second and third rings of the trachea—was usually performed under general anaesthesia. The cuffed tube was then inserted through the tracheotomy opening and positive-pressure ventilation initiated. Obviously, although there was what might be termed a standard treatment, it was often necessary to suit the special circumstances of the particular patient. They had, however, favoured an early tracheotomy, for it was found that late emergency operations were often unsuccessful.

In order to concentrate the patients for ease of treatment and post-operative care a special unit was opened to which were admitted all those with evidence of respiratory embarrassment. At each bedside there were all the essentials for suction, and on each corridor all equipment for tracheotomy, etc. On many occasions it became necessary to go out from the hospital to treat emergency cases at home; in this way the specialized help was brought to the patient so that he was made safely transportable before being transported.

In a rough way patients could be divided into two groups, the "wet" and the "dry." The latter, provided ventilation was kept satisfactory, often remained dry and in general did well in the tank type of respirator. The "wet" type could be divided into two broad groups. In the first, ventilation often improved once pharyngeal secretions had been dealt with. Some of these did well on postural drainage alone, but where there was some involvement of respiratory

*See *British Medical Journal*, May 30, 1953, pp. 1208 and 1216.

muscles tracheotomy was generally necessary. The second group showed ventilatory failure even after pharyngeal toilet and postural drainage, and for these tracheotomy with bag ventilation was essential. These cases always did badly in the tank respirator. Not the least advantage of the method was that treatment was available to every patient whether a tank respirator was available or not.

A large number of questions were raised in the subsequent discussion, to which the speakers replied. Dr. THOMAS ANDERSON and Dr. W. RITCHIE RUSSELL moved votes of thanks.

Nova et Vetera

WILLIAM HYDE WOLLASTON

It is just 150 years since the discovery of palladium by a medical man, William Hyde Wollaston. He was born in 1766 and graduated M.B., Cambridge, in 1787. He was



The obverse of the Geological Society's medal which is struck in palladium and awarded annually for outstanding researches concerning the mineral structure of the earth.

He was elected a Fellow of Caius College and spent two years working in pure sciences. After a period of clinical study in London he went into private practice in Huntingdon and Bury St. Edmunds. In 1794 he was elected a Fellow of the Royal Society, one of his sponsors being his uncle, William Heberden, and in 1797 he published a classification of renal calculi based on chemical analysis. He abandoned medicine for applied science in 1800, his decision being influenced by the fact that the sufferings of his patients caused him extreme mental distress. In 1803 he announced the discovery of palladium, and in the following year he discovered rhodium. He was secretary of the Royal Society from 1804 to 1816, and was elected president in 1820. Wollaston is regarded as the greatest pioneer in the platinum metal industry, since he was the first to bring a trained analytical mind to the problem of obtaining malleable platinum.¹ He died in 1828. In honour of the triple jubilee of Wollaston's discovery, the Institution of Metallurgists organized a Platinum Metals Exhibition in London during the week commencing October 19.

¹Nature (Lond.), 1953, 172, 700.

Over 300 representatives of Scandinavian and other countries attended ceremonies in Florence on October 24-25 in honour of Niels Stensen, the Danish anatomist. Stensen wrote an important treatise on muscular mechanics, and his *Observationes Anatomicae*, 1662, included the first description of the excretory duct of the parotid ("Steno's duct") and of the ceruminous glands. He travelled widely in Europe, especially in Italy, and much of his work was done in Florence. He became a convert to Roman Catholicism and was nominated as Bishop of Titopolis. Stensen lived for some years at the court of Tuscany, where he enjoyed the friendship of Duke Cosimo III. He died in 1686, aged 48, and was interred among the Medici tombs in the Basilica of San Lorenzo, Florence. During the recent celebrations his remains were borne in procession through the streets and back to the Basilica, where they were placed in a Roman sarcophagus given by the Italian government.

Correspondence

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

The Returned Prisoner of War

SIR,—Your leading article on this problem (*Journal*, October 10, p. 820) merits careful attention.

The emotional background of life in a prisoner-of-war camp, although perhaps more intense, is not essentially different from that of the uncaptured Serviceman in overseas theatres of war. Both in fancy picture the future in rosy colours and both may experience disillusionment and become unsettled on return to civilian life. According to a recent report from the Ministry of Labour and National Service on the resettlement of registered disabled persons¹ the number of ex-Servicemen disabled by psychoneurotic illness is 22,960 out of a national total of 32,484 for this particular condition. Timely recognition by doctors that employment difficulties may precipitate enduring neurotic illness in the emotionally strained demobilization phase could in many instances avert a later catastrophe.

Ample facilities for rehabilitation, vocational assessment, and full industrial training in many trades are provided at the industrial rehabilitation units and training centres of the Ministry of Labour. Early referral to one of these units of any occupationally unsettled ex-Serviceman, whether he has been a prisoner of war or not, is a simple prophylaxis against the most malignant form of disablement.—I am, etc.,

Bromsgrove, Worcs.

A. A. WHITE.

REFERENCE

¹Report on Resettlement of Disabled Persons During the Year 1952, 1953. H.M.S.O., London.

Succinylcholine Chloride for Casualty Anaesthesia

SIR,—Have Drs. Terence Vaz and J. M. Bishop (*Journal*, October 17, p. 885) stopped to consider that the light anaesthetic in casualty departments is often administered by doctors inexperienced in the use of relaxants? Although this method can be ideal when carried out by a skilled and experienced anaesthetist, in inexperienced hands it affords frightening possibilities for the conscious yet relaxed patient, whom the anaesthetist thinks is asleep, but who really is pink, paralysed, and perceptive.—I am, etc.,

Cambridge.

G. A. HART.

SIR,—Like Drs. Terence Vaz and J. M. Bishop (*Journal*, October 17, p. 885) I was struck with the possibilities of nitrous oxide and oxygen, with succinylcholine chloride as a relaxant, as an anaesthetic technique for out-patient orthopaedic manipulations. After induction with nitrous oxide and oxygen the dose of succinylcholine chloride ("scoline"), in the majority of cases 50 mg., was injected by the surgeon, and after relaxation had been obtained the manipulation was carried out. From the surgical point of view such a technique is excellent, but from the patient's point of view there are distinct disadvantages.

The majority of patients do not like being rendered unconscious by nitrous oxide if they have once been anaesthetized with thiopentone. If the patient is apnoeic as a result of the succinylcholine chloride it is difficult to keep a balance between cyanosis and consciousness, for the conscious patient cannot respond when completely relaxed. Excessive salivation, even after atropine, may cause stridor, and coughing is weaker on recovery, so that it is difficult to clear the respiratory passages. Many patients complain of a temporary loss of voice, and find this most unpleasant.

Although this technique may be satisfactory in the hands of the expert it is not suitable for use in the casualty depart-

ment, where anaesthetics may be given by the inexperienced. My orthopaedic colleagues and I abandoned this technique some eighteen months ago.—I am, etc.,

London, W.1.

JOHN GORDON.

SIR,—I agree with the opinion expressed by Drs. Terence Vaz and J. M. Bishop (*Journal*, October 17, p. 885) concerning the use of succinylcholine chloride for manipulations on casualties. This technique provides ideal conditions for the setting of fractures or other manipulations.

However, I have repeatedly noted that, during oesophagoscopy, the cardiac sphincter of the stomach relaxes when succinylcholine chloride is given. The average patient attending hospital as a casualty is quite unprepared for anaesthesia, and may well have a full stomach. For this reason, it seems to me that it is unjustifiable to add the further risk of regurgitation of stomach contents with a wide-open larynx to the already existing risk of vomiting. I have given up the use of succinylcholine chloride for manipulations on out-patients, except when I can be reasonably certain that the patient on whom it is proposed to use this drug has had nothing to eat or drink for at least four hours previously.—I am, etc.,

Luton.

D. C. ADAMSON.

Succinylcholine Chloride for External Version

SIR,—You may be interested in the following technique that I have been using for the past 18 months in various obstetrical departments.

Premedication consists of atropine 1/100 gr. (0.65 mg.), given as a rule by subcutaneous injection 45 minutes before the intended procedure. A syringe containing 100 mg. of succinylcholine chloride is introduced into a suitable vein and fixed in position (by strapping, "third hand," or similar device). Anaesthesia of a light plane is obtained by nitrous oxide and oxygen using a Boyle's apparatus. When consciousness is lost, 25 to 50 mg. succinylcholine chloride (according to the size of the patient) is injected, and 15 to 20 seconds later the surgeon may commence his manipulations. Relaxation of abdominal muscles leaves nothing to be desired. There is no marked effect on the uterine tone and usually a successful version is completed by the time the effect of this first dose of succinylcholine has worn off. Should temporary apnoea occur, this can easily be dealt with by rhythmic compression of the rebreathing bag filled with oxygen. Should the relaxation wear off before the completion of the version, further small doses of succinylcholine can be administered from the syringe still *in situ*. The patient wakes up from her N₂O anaesthesia in the usual manner and is fit to proceed home (if an out-patient) within a short time.

We have found this method very useful. It substitutes a light plane of anaesthesia where, before, deep ether or chloroform was found to be necessary. Unpleasant post-anaesthetic sequelae are conspicuous by their absence.—I am, etc.,

Sutton-in-Ashfield.

Z. LETT.

Orthopaedic Care in Poliomyelitis

SIR,—Orthopaedic surgeons have never claimed that they were capable of treating "all aspects of the acute stage of the disease (poliomyelitis)," and throughout the many years that they held responsibility for such treatment, long before Dr. Ritchie Russell's recent and sudden enthusiasm (*Journal*, October 24, p. 935), they never failed to collaborate with physicians.

But now that Dr. Ritchie Russell claims this right for himself—fortunately in isolation from most other physicians—and, in so doing, dismisses the prevention of contracture and deformity as "a simple matter which can be dealt with by properly trained nurses" it is time to point out that this dangerous observation shows how little he really knows about it.

He wants to go back 20 years in asking orthopaedic surgeons to "concentrate their efforts on the later stages when

the need for their special skill is most apparent." The fact is that orthopaedic surgeons do not want to display their special skill. They want to prevent the need for it long before it is apparent—and they can do so if they share treatment with physicians from the beginning.—I am, etc.,

London, W.C.2.

REGINALD WATSON-JONES,
President, British Orthopaedic Association.

SIR,—I have learned a great deal from my friend, Dr. Ritchie Russell, during the last few years, especially about the treatment of bulbar paralysis. I don't much mind his saying (*Journal*, October 24, p. 935) that I belittle the whirring pumps and all that (*Journal*, October 17, p. 884); I know that he knows that I do not really. But I am beginning to think that I have not been very competent in coaching him about the things that orthopaedic surgeons do in the treatment of poliomyelitis, and now I feel very sad about this. I ought to have saved him from making two howlers: (1) that all we think about is the prevention of deformity; he ought to travel round a bit and look at what is being done for the treatment of the paralysis itself—some of the physiotherapy departments and their staffs are rather impressive; and (2) that we fiddle about with splints for patients in respirators and so interfere with the good work being done by our medical colleagues. The answer to this one is simple: We don't.—I am, etc.,

London, W.1.

H. J. SEDDON.

Cancer of the Breast

SIR,—In their statistical paper on breast cancer, based on operative results at St. Bartholomew's Hospital, 1930-9 (*Journal*, October 10, p. 787), Messrs. I. G. Williams, R. S. Murley, and M. P. Curwen, with great courage and perseverance, have endeavoured by statistical methods without the aid of lymphatic anatomy or systematic pathological investigation to arrive at the best treatment for breast cancer. I believe they have set themselves an impossible task, and the indecisive character of their conclusions confirms that impression.

The authors dismiss in two lines, without references, my work on lymphatic permeation. They say: "Anatomical investigation has shown no evidence for the centrifugal permeation of lymphatics by cancer cells." It seems evident that they have not happened to see the second edition of my book *Cancer of the Breast*,¹ which contains conclusive evidence on the subject. This edition is exhausted and the French and American editions may be unobtainable, but I shall be pleased, if it is acceptable, to present a copy still in my possession to the library of St. Bartholomew's Hospital.—I am, etc.,

St. Olaves, Norfolk.

W. SAMPSON HANDLEY.

REFERENCE

¹Cancer of the Breast, 1922, 2nd ed. London.

Lead in Lollies

SIR,—In your annotation (*Journal*, September 12, p. 613) referring to lead in lollies you mention that a safe limit for domestic water is considered to be 0.3 p.p.m. of lead. In relation to public water supplies it may be pointed out that this figure would be unusually high, even for most soft waters after standing overnight in lead service pipes. In the U.S. Public Health Service *Drinking Water Standards*, 1946, for example, the presence of lead in excess of 0.1 p.p.m. was given as a ground for rejection of a supply.

With regard to your suggestion that "it would seem reasonable to make it illegal to sell lollies containing lead in a higher concentration than that found in the local drinking-water," this would appear to be indefinite and impracticable; a large proportion of drinking-waters, even when drawn from lead service pipes, contain no lead (less than 0.02 p.p.m.) detectable by a reasonably sensitive analytical procedure. The main feature of your annotation is that there should be a sufficiently strict limit, and for this purpose we tentatively suggest 0.2 p.p.m., bearing in mind the cumulative effect of this metal. This is the figure

suggested by the Food Standards Committee for beverages "ready-to-drink" other than beer, cider, or apple juice.

In instances which we have met recently, the lead in lollies has been due to the moulds used in their manufacture being tinned in a tin bath contaminated with a substantial percentage of lead. Lead-free tin can be used for moulds with satisfactory results. Your suggestion of aluminium would be likely to give rise to difficulties owing to this metal being susceptible to corrosion.

The above detailed comments are, however, of less importance than the general conclusion in your annotation that the limit for lead in lollies should be very low. I feel that this needs to be emphasized, because otherwise a much larger amount of lead might be permitted, as for solid foodstuffs. The fact that lead in excess of 0.2 p.p.m. can usually be avoided is proved by its absence from a large proportion of lollies now sold. In some high-grade products with a high content of total solid matter, however, a larger amount may be derived from the traces in the syrup, fruit pulp, citric acid, etc., without any contribution from the moulds, and this must be taken into consideration in fixing a standard for such products.—I am, etc.,

London, S.W.1.

ROY C. HOATHER.

REFERENCE

¹ *Analyst*, 1952, 77, 163.

Hop Dermatitis in Herefordshire

SIR,—We were most interested in the letters of Mr. C. L. Shaw (*Journal*, August 29, p. 511), Dr. F. Ray Bettley (p. 512), and Mr. John L. Struthers (*Journal*, September 26, p. 726). In reply to Dr. Bettley, it seems to us that an incidence of dermatitis of 1 in 30 does not necessarily suggest that hop-cones contain a primary irritant. Sensitizing agents vary in activity: with some, such as T.N.T., the incidence of dermatitis may be as high as 50%. Ten normal subjects were patch-tested with hop-cone; all tests after 48 hours were negative. This is in contrast with dermatitis patients, some of whom developed an eczematous reaction at the test site within 12 hours. Ten negative tests in normal subjects can, of course, prove nothing, but suggest that if hop-cones contain a primary irritant it is not a very active one. Tests may be done with dilutions of fresh hop-oil this year. The small quantity available last year was used to establish a difference between fresh and old oil.

We had supposed that hardening was the result of hypersensitization after repeated contact. Schwartz states¹ that if a worker does not learn to protect himself from a primary irritant he will be continually affected by industrial dermatitis. On the other hand, if the skin hazard consists of a sensitizer, and the dermatitis is not sufficiently severe to prevent the patient from working, he will in most instances develop a tolerance or hyposensitivity in from 3–6 weeks. The workers call this hardening. Schwartz also suggests that some workers who develop dermatitis so severe as to prevent them from working may develop tolerance on return to work. This is not supported by patients with severe hop dermatitis. For example, one patient who developed severe dermatitis after 10 days' contact last year succumbed after only half a day in the hop-yard this year.

In reply to Mr. Struthers, the damage to the skin by hop-spines was considered when cases were seen. Superficial scratches insufficient to draw blood are particularly common on the forearms and hands, but did not seem related specially to areas of dermatitis. Scratches are not common on the face, where dermatitis developed first in seven of our patients. One of these had an attack of dermatitis after visiting a hop-yard to deliver meat; he did not touch a single hop on that occasion. He also stated he developed dermatitis round his mouth after ingesting 10 pints of beer. In spite of this, in some cases abrasion may be an additional factor, due both to hop-spines and to efforts to clean hop juices from the skin after the day's work.—We are, etc.,

J. S. COOKSON.

ANN LAWTON.

Hereford.

REFERENCE

¹ *Modern Trends in Dermatology*, 1948, edited by R. M. B. MacKenna, p. 255, London.

Potassium Permanganate Ulceration

SIR,—We were interested to read the article by Mr. E. A. J. Alment and Dr. C. S. Nicol on potassium permanganate ulceration of the vagina (*Journal*, October 3, p. 759). We feel that the authors should be commended for bringing to wider notice a method of attempted abortion which certainly appears to be on the increase.

One of us has seen three or four cases of such vaginal ulceration in the last few years, and the lesion is not unknown on the North American continent. We agree that there is no doubt about the severity of the haemorrhage which follows insertion of potassium permanganate tablets. The authors quite rightly describe the lesion as being similar to a Hunterian chancre, but it is our experience that the ulcers are usually larger than a typical chancre. This, of course, depends on the size of the tablet and length of time during which it has remained in apposition to a certain area of the vaginal wall. We have found that one of the characteristic features of these ulcers is the very sharp, clear-cut edge between the ulcer and the normal vaginal skin. The intense blackness of the ulcer, too, is almost diagnostic in itself, but this we have found to be only a transitory finding, since—in our experience—the ulcers heal with remarkable rapidity. There is in hospital at the moment a case of permanganate ulceration, and already, after six days, the lesions are well on the way to complete resolution.

Finally, we do agree with the authors that this is a most unsatisfactory way to procure abortion, since in no case in our experience has it been effective.—We are, etc.,

Manchester.

JEFFERY SPRY LEVERTON.
IAIN H. KIDD.

SIR,—I note from the article by Drs. E. A. J. Alment and C. S. Nicol (*Journal*, October 3, p. 759) that the first account was written by Lacassagne and Friess in 1932.¹

In February, 1931, I was called to a nulliparous married woman who was vomiting seemingly blood-stained fluid. The sight of the "blood-stained" vomitus was sufficient to alarm the woman, her husband, and personal confidants, and she was advised by them to desist from further abortifacient attempts. "You will only kill yourself," she was told. I discovered that she had obtained potassium permanganate tablets from a local chemist. It has taken me 22 years to discover that the wrong orifice was used by the pregnant woman for the deposition of the tablets. I have no idea how many tablets were swallowed by her, but they certainly had a powerful emetic and deterrent effect.—I am, etc.,

Slough.

N. C. HYPHER.

REFERENCE

¹ *Arch. Méd. Pharm. milit.*, 1932, 96, 417.

Exposure Treatment of Burns

SIR,—With reference to your leading article (*Journal*, September 19, p. 665), I think the first, and main, indication in the treatment of burns is not so much the prevention of sepsis as the prevention of pain. The second main indication is the prevention of fluid loss via the burnt or scalded surface, and it is only after these two main requirements have been met that one should think of sepsis.

I think egg-white meets all three requirements, and ought to be given a trial in a burns unit. I was once allowed to try egg-white on a child with a burn, and immediately the egg-white was applied the child stopped crying; therefore the pain must have been relieved. And the burn did well. An old lady told me she burnt her hand through upsetting a frying-pan of hot fat. The pain was intense but stopped as soon as egg-white was applied, and "a skin formed over my hand." No bandages, nothing else apparently, and the hand healed perfectly.

I suggest egg-white could be applied by being smeared over the burnt or scalded surface by hands enclosed in sterile rubber gloves. The eggs must be fresh and could be kept in a refrigerator in the casualty department ready for immediate use. As eggs are now fairly plentiful and not too dear, may I suggest this method be given a trial in the Birmingham—or other—burns unit? It seems to me to be worth it.—I am, etc.,

North Shields

F. M. E. DAVIES.

Breast-feeding in Oxford

SIR,—The findings of the above survey by Dr. Alice Stewart and Dr. Celia Westropp (*Journal*, August 8, p. 305) confirm the views I have held with increasing conviction over the years that breast milk, while of value to the baby during the first few weeks of its life, should rightly be regarded as a "running-in" fluid for the new digestive apparatus and not necessarily as the ideal nourishment for any length of time. It is too weak and lacks some of the necessary elements for optimum development. Twenty years ago we urged mothers to keep their babies on the breast and on nothing else except cod-liver oil and orange juice. This we now know to have been bad advice—we were raising flabby, anaemic, rickety children such as, with modern scientific feeding, we rarely now see in this country.

For many women breast-feeding is an exhausting process, and their health picks up rapidly when they stop it. Babies fed at an inadequate breast show irritability amounting to anger—and become contented and eager for their feeds when put on to the bottle. Whenever this happens I ask the mother if her love for her baby has diminished in any way. The answer is a scornful, "No, Doctor." Maternal love is an instinct based upon something deeper either than breast-feeding or, as used to be maintained, painful labour. Nor does the baby give any sign of psychological upset such as the psychiatrists feel it should.

At the age of 1 year I would defy anyone to pick out the breast-fed baby from the bottle-fed one—and the same at 5 years of age. I have taken feeding histories of 400 children aged 5 and have failed to find any one aspect of physical development better in the breast-fed than the bottle-fed. In short, science in this department of life, as in so many others, has improved on nature. I see no reason to regret it.—I am, etc.,

Topsham, Devon.

GRACE H. WALKER.

Tuberculosis Classification

SIR,—Since Dr. Milosh Sekulich suggests (*Journal*, October 24, p. 938) that the review of his book which I contributed to your columns (*Journal*, September 26, p. 715) was unfair and misleading, I may perhaps be permitted a brief reply to his letter.

His book sets out to expound a classification of tuberculosis. A classification should conform to two criteria. It should be logical and self-consistent, its headings so far as possible mutually exclusive, and its basis a corpus of generally agreed and established knowledge; and it should prove convenient and neat when the facts are fitted into it. Of these the first is by far the more important, for any given body of facts can be fitted with more or less convenience into many different classifications, and whether or no any one of these serves its purpose in conducting to clarity of thought will depend principally upon its intrinsic qualities as a logical system. For this reason it seemed to me the duty of the reviewer to concentrate attention upon the logical aspects of the classification.

I have no doubt that Dr. Sekulich can fit any variety of pulmonary tuberculosis into his classification, since he accepts all the theoretical interpretations of observational data which, as I pointed out, are inextricably interwoven with it. But when I attempt the same task I find myself face to face with difficulties and doubts, since I (and, therefore, I imagine, many others) do not accept as established many of the theoretical assumptions which are implicit in

the classification, and of which I enumerated a few in the course of my review. Hence I am quite unrepentant in reiterating that simpler and less ambitious systems are less likely to give rise to confusion.—I am, etc.,

J. G. SCADDING.

London, S.W.3.

The Diploma in Public Health

SIR,—In criticizing the course of instruction for the Diploma in Public Health, Dr. Max Park (*Journal*, October 3, p. 778) has surely missed the point. This diploma is not designed merely to give the necessary technical instruction to a prospective assistant M.O.H. in England. A person with the letters D.P.H. after his name should be an expert in public health in the widest sense of the word. Primarily he should be trained to be an administrator—since public health is largely administration—and able to administer organizations that embrace fields far wider than that within the scope of the average English assistant medical officer of health.

The essentials of this course should include a thorough understanding of at least the following items: the law relating to health—the public, the school, and the factory; the functions of local and central government administration; epidemiology, not only of infectious diseases, but of all sickness, including accidents and occupational diseases; statistical methodology; health educational techniques; all this in addition to the fundamentals of classical public health and sanitary science, the immunology, environmental hygiene, and the like. Far from wishing to reduce his scope, the prospective public health expert should take every opportunity to widen it. Anyone with a real interest in his subject, and who is not interested in the diploma merely as a means of getting himself a job, will be glad to learn all he can about such related subjects as bacteriology, entomology, and parasitology. These are still essential to a real understanding of a large part of preventive medicine. Similarly the course should include a study of nutrition, carcinogenesis, mental health, etc. And one who will have to administer the work of sanitary inspectors, and perhaps factory inspectors, will not begrudge time spent in obtaining at least an understanding, if not a mastery, of these two subjects in addition to his own.

The science of preventive medicine, as developed in England, is honoured and respected throughout the world. It would be a sad day indeed if we followed the suggestion of Dr. Max Park and limited the course of instruction to the small world of the infant welfare centre and the school medical service.—I am, etc.,

Geneva.

W. NORMAN TAYLOR.

Prevention of Transfusion Accidents

SIR,—Several speakers at the Consulting Pathologists' Group Conference are reported (*Journal*, October 17, p. 878) to have stated that too much blood is ordered by clinicians for surgical and other cases. May not this attitude among the clinicians be a reflection of the advice given by Grant and Reeve in a recent Medical Research Council Special Report,¹ where it is pointed out that clinicians have habitually given too little blood, according to blood volume estimations in many surgical cases? The lessons of this report have been applied very widely, and with benefit, I feel sure. Some simple and rapid method of assessing blood volume in any patient is required. The report rather frowns on haemoglobin estimations as a guide to blood volume, but, with the limitations of the method in mind, a haemoglobin estimation gives useful information.

The greatest enemy of safe blood transfusion is haste: emergencies have to be dealt with adequately, but the technique of preparation must not suffer, and the person actually doing the preparations should be protected from alarmist procedures while at work.—I am, etc.,

Epping.

FRANK MARSH.

REFERENCE

¹ Grant, R. T., and Reeve, E. B. (1951). "Observations on the General Effects of Injury in Man, with Special Reference to Wound Shock." *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 277. H.M.S.O.

Obituary

ROBERT TENNENT, M.B., F.R.C.S.Ed.

The death of Mr. Robert Tennent in a nursing-home at Stirling on October 9 at the age of 62 has deeply affected a very wide circle of friends.

Robert Tennent was born at Strathaven, Lanarkshire, on November 13, 1890, and received his early education at Hamilton Academy, of which he was a distinguished pupil. From the University of Glasgow he graduated M.B., Ch.B., with honours, in 1914, a few months before the outbreak of the first world war, in which he served throughout in the Royal Navy. He was granted leave to take the Fellowship of the Royal College of Surgeons of Edinburgh, and this he did in 1917.

After the war he was appointed to the staff of the Royal Hospital for Sick Children, Glasgow, where he was junior to the late Mr. Alexander MacLennan, whom he also assisted in private practice. His appointment to the Victoria Infirmary soon followed, and there, after some years as first assistant to Mr. R. B. Carslaw, he was given charge of wards in 1927 at an unusually early age. Making this work his chief interest and regretfully discontinuing his appointment at the Sick Children's Hospital, he entered into a period of very active hospital and private practice, which terminated by his resignation in 1949, the end of his long and happy association with the Victoria being forced upon him by failing health.

In 1924 he accepted the invitation to become visiting surgeon to Falkirk Infirmary, and his connexion with this hospital was also a very happy one; he shared the responsibility and credit for the planning of the Royal Infirmary, which was opened there in 1932. It was therefore understandable that he should continue to do some work there even after his retirement from practice in Glasgow.

Tennent's work in the Victoria Infirmary earned for him in Glasgow and throughout the West of Scotland a very high reputation, particularly in the fields of abdominal and thyroid surgery; in the latter he achieved especial eminence, and it is to be regretted that he did not live to carry out his intention of publishing his results. Although he latterly tended to be more circumscribed, he was so much the general surgeon that any new method received consideration and underwent trial at his hands. He had been, for example, one of the first in this country to use the Harris technique for prostatectomy. Above all, Tennent was characterized by a dexterity and gentle-handedness which gave him results surpassed by few. He was a surgeon who could make surgery look easy, and his celerity, combined with a natural aptitude for work, made his life an exceptionally full and busy one.

Mr. Tennent taught well and was for many years a clinical lecturer in surgery in the university, and in his later years he examined for the final M.B., Ch.B. Probably the unofficial teaching which he did as an assistant surgeon gave him the greatest pleasure. For many years he gathered round him on Saturday mornings a large number of final-year men, and his ward rounds then were a delight. Many a student learned as much surgery from his informal, anecdotal talks as from a series of more sedate clinics, and these tutorials will live long in the memories of those who attended them. He was

regarded as a most kindly final examiner, and it is difficult to imagine any candidate being other than at ease with him.

In spite of all his activities Tennent found time for many interests apart from his profession. Angling was his first love, and he knew intimately most of the rivers of his native country. His friends were legion among countrymen in all walks of life, and his love of country things and country folk was exemplified by his wide knowledge of Scots ballads, which his retentive memory enabled him to recite freely. It was another of his Scots attributes that he could quote the Old Testament at length and with accuracy.

Robert Tennent was a fine surgeon, and he was also a fine man. He was generous to a fault, and his help was always available to patient and colleague alike at no matter what sacrifice of his time and energy. Many young men owe their start in general practice and in surgery to the unselfish help given by him. The second world war made increasing demands on him at a time when normally he might have been expected to begin to enjoy more leisure. These demands were met in full, but only at a cost, and in 1947 came the first signs of the vascular disorder which made it necessary for him to modify his activities. Shortly after this he went to live at Dunblane and gradually made his severance from the city of Glasgow wellnigh complete.

No greater tribute could have been paid to Robert Tennent than the presence of so many friends from so many walks of life at his funeral service in Dunblane Cathedral. He leaves a widow, three daughters, and two grandchildren, of whom he was exceedingly proud. He will be remembered by many with gratitude and affection.—J. P. G. and R. G. H.

I. WALKER HALL, M.D.

Professor I. Walker Hall died at his home at Godalming on October 9 at the age of 85, twenty years after retiring from the chair of pathology in the University of Bristol.

Isaac Walker Hall was born on September 16, 1868, and was educated at Owens College, Manchester, graduating M.B., Ch.B. with honours at the Victoria University of Manchester in 1899 and proceeding to the M.D. three years later. After graduation he continued his studies at Leipzig, Stockholm, and Wiesbaden, and met and worked under the leading bacteriologists and pathologists of those pioneer days. On his return to Manchester in 1900 he was appointed senior demonstrator of physiology, and in the following year he became lecturer in pathology in the university. In 1905 he published, with G. Herxheimer, a book entitled *Methods of Morbid Histology and Clinical Pathology*, which they dedicated to the memory of Carl Weigert. It was a remarkably useful practical handbook.

In 1906 Walker Hall was appointed the first honorary pathologist and bacteriologist to the Bristol Royal Infirmary and the first professor of pathology in the Bristol University College, as it then was. He rapidly gained a reputation throughout the West Country, and within a few years his laboratory at the infirmary was receiving specimens from as far away as Cornwall, there being then no other pathologist in the area. A small department was provided for him in the university buildings in 1910. All the public health bacteriology for Bristol and the adjacent counties and all the clinical

pathology were conducted in these small university laboratories with a staff which, by modern standards, was totally inadequate. Walker Hall's own enthusiasm, energy, and skill made this and much more possible. The first of a series of important papers on the role of carriers in typhoid fever came from his pen in 1908, and he made numerous contributions to the literature on the bacteriology of public health, including work on the pasteurization of milk, the contamination of ice-cream, *Brucella abortus* infection, and bubonic plague.

As a teacher Walker Hall will be remembered for his graphic illustration of immunological procedures. He had a collection of toy animals: a sheep would be "bled" and the "blood" injected into a toy rabbit to illustrate the production of haemolysin for the Wassermann reaction. His students suspected that these toys really belonged to his daughter. He was a delightful lecturer and a stimulating person. When he retired from the chair of pathology in 1933 and was made emeritus professor he became the first director of the university's new department of preventive medicine in laboratories provided by the university in what was previously a student hostel at Canynge Hall. The development of this department was due to his vision and was of immeasurable importance to the university and to the city of Bristol, providing a link between the two authorities which has remained happily without interruption, so that to-day the public health laboratories, the city analyst, and the food inspectors are all housed in the same building with the departments of pathology and bacteriology. He made a place for himself in the history of Bristol and in the history of public health bacteriology in this country.

A member of the British Medical Association for fifty-five years, Walker Hall served as a vice-president of the Section of Pathology when the Association held its Annual Meeting at Belfast in 1909, and at Liverpool in 1912 he was president of the same Section. He was a member of the consulting pathologists group committee of the B.M.A. from 1928 to 1934, and an honorary member of the Association of Clinical Pathologists.

In 1936 he finally retired from Bristol and went to live at Godalming, where his wife, long an invalid, predeceased him. He leaves a daughter.—T. F. H.

J. F. R. GAIRDNER, M.B., M.R.C.S.

Dr. Frank Gairdner, who died at his home at Bungay, Suffolk, on October 8 at the age of 82 after a long and varied life, came of an illustrious Scottish medical family, for his father, Sir William Tennant Gairdner (1824-1907), was professor of medicine in the University of Glasgow from 1862 to 1899 and a Fellow of the Royal Society, and his grandfather, John Gairdner (1790-1876), was President of the Royal College of Surgeons of Edinburgh from 1830 to 1832 and treasurer of the College for many years.

John Francis Robert Gairdner was born at Glasgow on February 6, 1871, and was educated at Uppingham School and Glasgow University, where he graduated M.B., C.M., with honours, in 1894. Although his natural bent was medical rather than surgical, his father's fame, at its height when his son graduated, made it not easy (he conceived) for the young Dr. Gairdner to adopt the career of a physician in Glasgow. He therefore took a series of surgical appointments which ended with his becoming assistant to Mayo Robson at Leeds. Eventual elevation to the full surgical staff at Leeds seemed certain, but the beginning of the South

African war in 1899 caused him immediately to join the Expeditionary Force. Extraordinary were the tales he would tell of the medical side of that campaign, for the ravages of enteric fever overwhelmed the Army medical services and led to appalling scenes, much like those described by Florence Nightingale in the Crimean war. When the South African war ended he found he had become much enamoured of that country and decided to stay abroad for a time. He practised first at Germiston, Transvaal, and later at Pretoria, where he became a member of the town council. At the outbreak of the first world war he joined the South African Medical Corps and served against the Germans in South-west Africa. He then joined the R.A.M.C., saw service in France, and later commanded the surgical division of a hospital in Macedonia, with the rank of major.

After the war Dr. Gairdner became surgeon and superintendent to a hospital which had been opened by the owners of a group of collieries in the mining town of Ashington, Northumberland, and there he worked for nineteen years. The work involved a good deal of assessment of compensation in cases of injury, and in this difficult field his patent integrity was of great account. Some years after he went to Ashington he was stricken with severe rheumatoid arthritis and seemed unlikely ever to be able to resume surgery. However, after many months he was able to return to work, albeit with sadly stiffened hands, with which, nevertheless, he was delighted to find himself able to operate as before.

Like many quiet and humble men, his influence upon all classes and kinds of men was great, as the many who served as his house-surgeons at Ashington can testify. "He was one of the most outstanding men whom I have been privileged to meet and to know," wrote one. He had a wonderful old-world courtesy and an endearing conviction of the all-round superiority of the opposite sex.

When the second world war began he had just retired, but was soon working again as medical superintendent of an E.M.S. hospital. In 1941, when he was 70, he learnt that there was a shortage of doctors in the Merchant Service and managed to sign on as a ship surgeon, serving for the next two years at sea, mainly on transatlantic runs. He is therefore one of the few men to have gained both the Queen's medal for service in the South African war and the Atlantic Star for service in the last war.

In retirement, Dr. Gairdner was able to cultivate his talents for archaeology, literature, and botany, but the loss of his wife in 1950 dealt him a blow from which he never fully recovered.

FLORENCE R. SABIN, M.D.

Dr. Florence Rena Sabin, the distinguished American anatomist, died at Denver, Colorado, on October 3. She was born on November 9, 1871, in the mining district of Colorado. After obtaining a B.Sc. degree in 1893 she became a schoolteacher in order to earn sufficient money for a medical education. In 1896 she entered Johns Hopkins Medical School and graduated M.D. in 1900. She then joined the research staff in the anatomy department of the school, a post made possible by an endowed fellowship provided for her by the Baltimore Association for the Promotion of University Education of Women. Under F. B. Mall (of whom she wrote an excellent biography in 1934) she embarked on her classical studies on the lymphatics and haemopoietic system. Her important monograph on *The Origin and Development of the Lymphatic System* was

published in 1913. She contributed more than a hundred papers to the literature on the lymphatics, blood vessels, origin of blood cells, bone marrow, and tuberculosis. She was associate professor of anatomy at Johns Hopkins from 1905 to 1917 and was then appointed to the chair of histology. She held this position until 1925, when she left to join the Rockefeller Institute for Medical Research, where she remained until 1938. From 1924 to 1926 she was president of the American Association of Anatomists. Dr. Sabin was the first woman to graduate from Johns Hopkins University, the first woman to teach there, and the first woman member of the Rockefeller Institute and the National Academy of Sciences. The late Simon Flexner once referred to her as "the greatest living woman scientist and one of the foremost scientists of all time."

We record with regret the untimely death of Dr. ANTHONY NOY SCOTT on October 14, at the age of 29. He was a most congenial and happy person and will be greatly missed by his many friends. The son of Dr. and Mrs. Steuart Noy Scott, of Plympton, Devon, he went to Clifton College in 1937, and from there to Jesus College, Cambridge. At Cambridge he was, as throughout his whole life, a most popular person. He attained great heights on the hockey field, playing for the university for three years, for one of which he was captain. In 1947 he went on from Cambridge to the London Hospital. He quickly made many friends there and became more than an asset to the hospital hockey team. He also played regularly for Essex county, having previously played for Devon. Soon after coming to "The London" he married Jean Duncan, and the following year their daughter was born. He had many interests besides medicine. He was very skilled with his hands, and ingenious in the uses he put them to; and his knowledge of motor-cars never ceased to amaze. After qualifying in 1952 he decided to take one or two house appointments, but these were cut short by the onset of his fatal illness. This he bore with extreme courage and outward cheerfulness. Our deepest sympathies go to his young widow and their daughter, and to his parents.—D. N. S.

The death occurred on September 25 at Lenox Hill Hospital, New York, of Dr. MAX EINHORN, the gastroenterologist. He was aged 91. Max Einhorn was born near Grodno (then in Russia) on January 10, 1862. He qualified M.D. Berlin in 1884. In the following year he emigrated to New York. After a house appointment at the German Hospital he became associated in 1889 with the Post-Graduate Medical School and Hospital, where, seven years later, he was appointed to the chair of internal medicine, becoming professor emeritus in 1922. He contributed several important textbooks to the literature of gastroenterology and originated the concept of achylia gastrica to indicate a primary nervous functional disorder of secretion.

Dr. THOMAS MCCLURE, who died recently, was a native of Northern Ireland and was educated at Queen's College, Belfast, and at Edinburgh University, taking the Scottish triple qualification in 1907. He then went to South Wales as chief assistant in an extensive colliery practice in Pontypridd, and afterwards joined his brother, Dr. Samuel McClure, in general practice at Cwmgwrach and Glyn Neath, where he practised for forty years. He retired in 1948. His long association with the district engendered a keen affection for all its inhabitants, and he was proud of the fact that he was not merely regarded as the doctor, but better still as a friend. He evinced a deep interest in the social life and welfare of his patients and proved a generous sponsor of every movement inaugurated for the benefit of the community. In his younger days Dr. McClure was a good angler, a good shot, and an accomplished photo-

grapher, but the rapid increase in the local industrial population curtailed his leisure for these pursuits, and his chief hobby then was gardening, on which he became an authority. His gardens were the admiration of all in the district, and in them he found the ideal recreation, for he was always on call, especially for the colliery accidents which were then so frequent in the district (the injured being usually treated at home). For the same reason he developed another hobby, carpentry in native Welsh oak, and in this, as in everything else, he showed considerable skill. Many fine examples of his work are to be found in his home and in the homes of some of his friends. His outstanding characteristic was that whatever he undertook to do he did well. He leaves a widow, who was his help-mate throughout a happy married life.

Medical Notes in Parliament

MENTAL LAW REVISION

Inquiry by Royal Commission

The announcement that there is to be a Royal Commission to inquire into the law and administration relating to the certification and detention of persons suffering from mental illness and mental defect was made by Sir WINSTON CHURCHILL in the House of Commons on October 22. The names of members of the commission will be announced later. The terms of reference are:

"To inquire as regards England and Wales into the existing law and administrative machinery governing the certification, detention, care (other than hospital care or treatment under the National Health Service Acts, 1946-52), absence on trial or licence, discharge, and supervision of persons who are or are alleged to be suffering from mental illness or mental defect, other than Broadmoor patients; to consider as regards England and Wales the extent to which it is now, or should be made, statutorily possible for such persons to be treated, as voluntary patients, without certification; and to make recommendations."

Sir Winston Churchill said that the Government had had this matter under consideration for some time, and realized that legislation was desirable to bring the law into line with modern thought and development. They considered, however, that there should first be a comprehensive review of the subject by an independent body.

Mr. ANEURIN BEVAN welcomed the announcement, but commented that the last part of it might give the impression that there were no voluntary patients. The Prime Minister knew that a large proportion of patients treated in mental institutions were voluntary, and it was because the treatment was so satisfactory that it was desired to extend it. Sir WINSTON CHURCHILL agreed, and said it was intended to extend voluntary treatment as far as possible, subject always to making sure that people were properly protected by certification in cases where treatment involved a considerable measure of restraint.

Mr. A. WOODBURN asked whether the terms of reference would include the difficulty of old people who were certified to give them room in mental institutions—people who were suffering from the decay of their mental faculties without necessarily being insane. Sir WINSTON CHURCHILL said he thought the matter would be considered by the Commission.

There were several questions about the restriction of the inquiry to England and Wales, and the exclusion of Scotland, where the law is different. Sir WINSTON CHURCHILL said that he was not ruling out a Scottish inquiry, but it would be a pity to mix them together. It seemed to him fairly certain that one would lead to the other—to which he added subsequently that he would like to convey an announcement about Scotland as soon as possible. He also stated that he would bear in mind, when considering the type of person to serve on the Commission, a point made by Mrs. Brad-dock, that it should include some of the younger school of medical practitioners who were fully qualified in psychiatry.

GIRL'S DETENTION IN MENTAL HOSPITAL

The Home Secretary made a long statement, in reply to questions by four Members on October 22, on the circumstances of the removal by the Home Office from Hollymoor Mental Hospital of a 14-year-old Shropshire girl. Two of the questions asked for an inquiry.

Sir DAVID MAXWELL FYFE stated that the girl, born on July 13, 1939, appeared before the Church Stretton (Shropshire) juvenile court on September 25, 1952, as being in need of care or protection, and was ordered to be sent to an approved school. The order authorized her detention in an approved school until September 24, 1955. The court had information that the girl had been before the court three times for stealing and had been put on probation, that her ability and educational attainment were below average, that seven men had been committed for trial at Assizes in September, 1952, on charges in connexion with her, and that the parents had been warned from time to time by probation officers about the family's association with one of these men, who had been a frequent visitor to their house since 1947 or 1948.

On October 24, 1952, after two outbursts of violent and hysterical behaviour in the remand home where she was awaiting a vacancy in an approved school, she was removed to Hollymoor Mental Hospital on an Urgency Order. Before the expiry of the Urgency Order at the end of seven days, the hospital authorities obtained the father's written consent as required by law to the girl's residence in the hospital as a voluntary patient. On January 14, 1953, the consultant psychiatrist of the regional hospital board wrote to the Home Office reporting that the girl appeared to have found an environment which suited her, but that she showed an impaired reasoning power and a distortion of reality, and that there was a strong schizoid element. He thought she was unfit to be sent to an ordinary approved school or to be sent home, and that she could very well remain at Hollymoor Hospital, where she was receiving no schooling, provided that she was given regular psychiatric treatment as an out-patient in the children's department of another Birmingham hospital. The Home Office accepted this view, and accordingly suggested to the Shropshire County Council that the approved school order should be discharged, the girl remaining a voluntary patient in the hospital. The county council suggested that consideration should be given to the possibility of arranging for the girl to be committed to the care of the hospital authorities as a fit person, and agreed that the approved school order might be discharged.

While the county council's suggestion was under consideration, the acting medical superintendent of the hospital wrote to the Home Office saying that, while he did not regard the girl as a suitable case for indefinite retention in Hollymoor Hospital, he did not consider it advisable for her to be sent straight to an ordinary approved school. In view of this, the suggestion made by the Shropshire County Council was not pursued, but arrangements were made for a senior medical inspector of the Home Office Children's Department to visit the girl at Hollymoor Hospital and discuss her case with the hospital medical authorities. On visiting the hospital on April 8, he learned that medical opinion at the hospital considered the girl to be certifiable as mentally defective. The Home Office therefore invited the Shropshire County Council to present a petition to the judicial authority for the girl's certification. The county council agreed, and the medical superintendent of the hospital expressed his willingness to retain the girl at Hollymoor until a petition could be presented. The Birmingham Regional Hospital Board then endeavoured to find a vacancy in a suitable institution.

On August 29 the Shropshire County Committee of Trades Councils wrote to the Home Office saying that the girl's father had approached them, that the secretary of the committee had visited the girl in hospital on August 24 and was "quite satisfied, in conjunction with other competent hospital authority, that the girl is not insane," and that the Home Office should arrange for the girl's removal from the hos-

pital as a matter of urgency. On September 1 the chairman of the Hollymoor Hospital Management Committee wrote to the Home Office saying that, in his view, the girl was not suitable for either a mental hospital or a mental deficiency institution. The Home Office ascertained from the medical superintendent of the hospital that he still considered that the girl should be certified under the Mental Deficiency Acts. In view of these conflicting opinions, the management committee's requests for early removal, and the difficulty of finding a place for her, the Home Office decided in consultation with the Ministry of Health that the girl should be removed to a classifying approved school for observation and assessment.

Arrangements were made accordingly for the girl to go to the Shaw Classifying School, near Warrington, on September 28. It was learned subsequently that the girl's father had given the hospital authorities the requisite 72 hours' notice to withdraw his daughter, as a voluntary patient, from the hospital, and that he intended to take her home on September 26. Had the girl been taken home by her parents, it would have been necessary to remove her from her home in pursuance of the approved school order. In view of the disturbance which this would have involved for the child, the Home Office arranged for her to go to the Shaw School on September 25.

The Home Office had acted throughout with the girl's best interests in view, and the decision to remove her, in pursuance of the court order, to an approved school (despite the doubts about her suitability for approved school training) was not taken until it became clear that her continued retention in the hospital was not favoured by the hospital management committee. She was not allowed to return home, since the court had decided by the making of an approved school order that, in her own interests, she should be removed from her home environment, and that order was still in operation. There was no foundation for the suggestion that the girl's removal to an approved school in pursuance of an order of the court infringed the rights of the parents, and it was the order itself which restricted the girl's liberty. Both he and the Minister of Health were satisfied that, notwithstanding the unfortunate differences of opinion between the lay members of the hospital management committee and the medical authorities as to the girl's mental condition and as to the proper method of dealing with her, all the parties concerned acted throughout in what they believed to be the girl's best interests. The case illustrated the necessity for an inquiry into the methods of certification of patients suffering from mental troubles on the lines of the royal commission which the Prime Minister had announced.

"Smog" Warnings Proposed

The Minister of Housing and Local Government was asked by Mr. N. N. DODDS and Lieutenant-Colonel M. LIPTON on October 20 what action he was taking to combat fogs similar to those of last December, when many people died as a result of air pollution.

Mr. HAROLD MACMILLAN replied that so far as he knew the only practicable way of combating "smog" was to reduce smoke from chimneys. The problem was not one for which it was easy to devise emergency plans. He was awaiting the report of the Beaver committee. Meanwhile a special effort was needed by all those who burned coal to use it efficiently, and as sparingly as possible during fogs. This applied to householders no less than to industrial and other consumers.

Mr. DODDS said it was remarkable that the Government had no plan ready, in view of the heavy death roll, and, as much was known already about air pollution, would it not be possible to give a warning if similar weather conditions were likely, and to request that domestic open fires and certain industrial processes should be dispensed with during the danger period? Mr. MACMILLAN said that he welcomed this and any other suggestions. He also stated in further replies that the committee on air pollution, presided over

by Sir Hugh Beaver, which was appointed last July, had lost no time and intended to present an interim report shortly—within a few weeks.

Infant Mortality in British Guiana

Mr. O. LYTTELTON, Secretary of State for the Colonies, published a reply on October 21 giving the infant mortality rates in British Guiana for the years 1945-52. These were (per 1,000 live births): 1945, 101; 1946, 87; 1947, 87; 1948, 78; 1949, 77; 1950, 86; 1951, 77; 1952, 82.

In 1946, he stated, the expectation of life was calculated at 49 years for males and 52 for females. Since then there had been a downward trend in death rates, and an approximate calculation for 1952 gave an increase of four years.

Consumption of Milk

Dr. CHARLES HILL, Parliamentary Secretary, Ministry of Food, stated on October 21 that the average weekly consumption of milk per person in the first six months of this year was 4.65 pints. The corresponding figures for 1952 and 1951 were 4.73 and 4.83 pints respectively. The total consumption of full-price liquid milk by the public last August was about 108 million gallons, compared with 110 millions in 1952 and 112 millions in 1951.

Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending October 17 (41st week of the year) were as follows: paralytic, 81 (107); non-paralytic, 45 (69); total, 126 (176). This is a decrease of 50 compared with the previous week, the figures for which are in parentheses. The seasonal fall seems now to be well under way.

Week Ending October 17

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,062, whooping-cough 2,096, diphtheria 20, measles 742, dysentery 232, and paratyphoid fever 11.

Infectious Diseases

Only small variations were recorded in the returns of infectious diseases in England and Wales during the week ending October 10. The largest were increases of 103 for whooping-cough, from 2,292 to 2,395, 70 for measles, from 621 to 691, and 55 for dysentery, from 212 to 267.

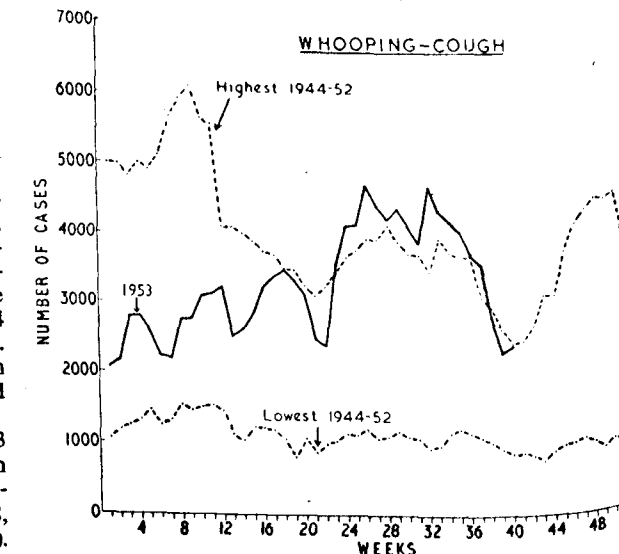
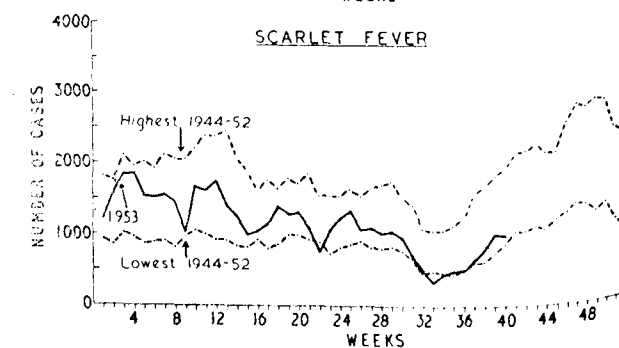
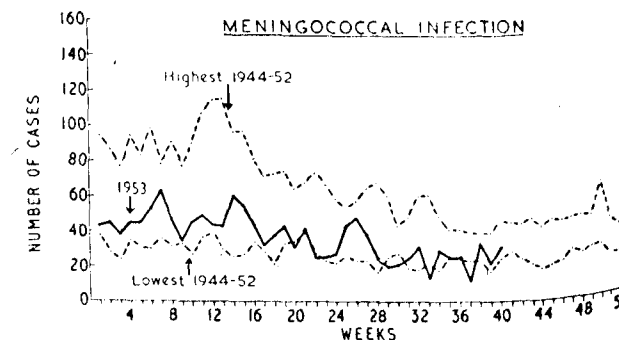
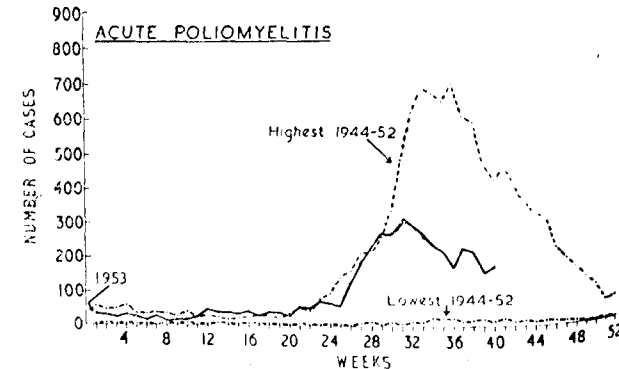
986 cases of scarlet fever were notified, 6 fewer than in the preceding week, and no variations of any size were reported in the local trends. The largest fluctuation in the returns of whooping-cough was a fall of 38 in Warwickshire, from 140 to 102. The largest rise in the number of notifications of measles was 39 in Lancashire, from 128 to 167. 24 cases of diphtheria were notified during the week, and these were 4 fewer than in the preceding week. The largest fluctuation in the local returns of diphtheria was a fall from 7 to 3 in Staffordshire.

The downward trend of the notifications of acute poliomyelitis was interrupted by a rise of 19 during the week. 176 cases were notified, and these were 28 more for paralytic and 9 fewer for non-paralytic cases than in the preceding week. The chief centres of infection were Lancashire 20 (Blackpool C.B. 5, Liverpool C.B. 4), London 14 (Lewisham 4, Woolwich 3), Somersetshire 14 (Clevedon U.D. 3, Long Ashton R.D. 3), Warwickshire 12 (Birmingham C.B. 4, Coventry C.B. 3), and Dorsetshire 11 (Blandford Forum M.B. 3, Wimborne and Cranborne R.D. 3).

The largest returns of dysentery were London 43 (Lewisham 9), Yorkshire North Riding 38 (Middlesbrough C.B. 38), Northumberland 26 (Gosforth U.D. 24), Lancashire 23 (Liverpool C.B. 10), Yorkshire West Riding 18, Middlesex 16, and Warwickshire 16 (Birmingham C.B. 10).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending October 10 (No. 40) and corresponding week 1952.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	20	0	3	0		25	1	13	2	1
Dysentery ..	267	43	136	3	4	192	28	117	1	1
Encephalitis, acute ..	3	0	0	0		1	0	0	0	
Enteric fever: Typhoid ..	4	1	2	1	2	4	0	3	2	1
Paratyphoid ..	13	0	0	0	1	23	2	0	0	
Food-poisoning ..	165	12		0		117	15		23	
Infective enteritis or diarrhoea under 2 years ..				14	47				15	29
Measles*	691	13	75	15	97	4,696	554	74	32	33
Meningococcal infection ..	31	1	13	1	1	29	4	9	0	
Ophthalmia neonatorum ..	42	8	8	0		32	2	13	0	
Pneumonia†	333	28	107	5		371	22	213	6	
Poliomyelitis, acute: Paralytic ..	107	8		25	15	101	15		3	9
Non-paralytic ..	69	6				54	7			
Puerperal fever‡	249	36	14	2	2	219	33	15	0	1
Scarlet fever ..	986	58	165	31	45	1,284	118	275	13	58
Tuberculosis: Respiratory ..			123	26				120	33	
Non-respiratory ..			27	2				17	4	
Whooping-cough ..	2,395	167	235	28	148	1,126	86	69	17	35

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0			0	0	0		0	0
Dysentery ..	1	0				0	0		0	
Encephalitis, acute ..	0				0	0			0	
Enteric fever ..	0	0				0	0		0	
Infective enteritis or diarrhoea under 2 years ..	7	2	1	0	1	9	0	1	0	2
Influenza ..	6	1		0	1	7	0		0	0
Measles ..	0				0	0			0	0
Meningococcal infection ..	0					0				
Pneumonia ..	115	15		9	0	142	17		4	2
Poliomyelitis, acute ..	3	0			0	7	2			0
Scarlet fever ..	0				0	0			0	0
Tuberculosis: Respiratory ..	89	7	9	3	6	92	13	9	3	2
Non-respiratory ..	2	2	2	0	0	0	1	0	0	
Whooping-cough ..	2	0		1	0	3	1		0	0
Deaths 0-1 year ..	224	26	14	7	9	211	22	25	8	20
Deaths (excluding stillbirths) ..	4,520	636	522	83	13*	4,673	660	508	97	136
LIVE BIRTHS ..	7,813	211	919	213	417	7,816	142	915	232	429
STILLBIRTHS ..	190	21	21			176	27	25		

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

Medical News

Scientific Exhibition at Glasgow.—The Annual Meeting of the B.M.A. will be held in Glasgow next year, and arrangements are already being made to hold the Scientific Exhibition from July 5 to 9. The exhibitions at Dublin in 1952 and at Cardiff this year proved most popular, and it is intended that the exhibition at Glasgow should cover a wide field of medical practice and research. Any doctor, hospital, or medical school wishing to provide an exhibit should apply for a stand as soon as possible. The last date for receiving applications is December 31, 1953. Those who would like further details or application forms should write to the Secretary, B.M.A. House, Tavistock Square, London, W.C.1.

Synthesis of Oxytocin.—In a letter to the *Journal of the American Chemical Society* (October 5, p. 4879) workers from Cornell University Medical College, New York, claim to have synthesized oxytocin, the principal uterine-contracting and milk-ejecting hormone of the posterior pituitary. If their claims are confirmed this will be the first synthesis of a polypeptide hormone. The synthetic product has been shown to be active in both stimulating labour and inducing milk ejection in women. A dose of 1 γ intravenously caused milk ejection in 20-30 seconds.

Commission on Divine Healing.—The Archbishops of Canterbury and York have appointed a commission composed mostly of clergymen and doctors to consider "the theological, medical, psychological, and pastoral aspects of 'Divine Healing.'" The commission is asked to provide, in two or three years' time, a report "to guide the Church to clearer understanding of the subject; and in particular to help the clergy in the exercise of the ministry of healing and to encourage increasing understanding and co-operation between them and the medical profession." The medical members of the commission are Dr. J. A. Hadfield, Dr. R. A. Henson, Dr. R. Cove-Smith, Professor Alan Moncrieff, Sir James Paterson Ross, Dr. Denis Brinton, and Dr. D. Stafford-Clark. All communications to the Commission should be addressed to the Secretary, Lambeth Palace, London, S.E.1.

Society of Medical Officers of Health.—The presence of the Minister of Education, Miss Florence Horsbrugh, as guest of honour at the annual dinner of the Society of Medical Officers of Health on October 22 emphasized the importance of the school medical service. Referring to the period when she was Parliamentary Secretary of the Ministry of Health in 1939, Miss Horsbrugh said that she was very glad that the Chief Medical Officer of that Ministry was also Chief Medical Officer of the Ministry of Education. She was also pleased to note that that example was being followed throughout the country; less than a dozen authorities now had two medical officers, one for health and one for schools. In the school dental service there were now the equivalent of 928 full-time dentists, the highest number ever in that service. The President of the Society, Dr. C. Metcalfe Brown, also touched on the school medical service. He said that he deplored the tendency to depend upon the consultants of the regional hospital board, and he considered that these consultants should in fact be members of the school health services. The child's health could be achieved only by a team—the parents, teachers, school medical officers, and consultants. Dr. Metcalfe Brown also referred to health visits. He said that the infant mortality rate of an area was inversely proportional to the efficiency of the health visit service, and he wanted to point out that others had found the same. The health of the guests was proposed by Dr. George Buchan, and Sir George Mowbray and Mr. Arnold Walker made brief replies.

Pneumoconiosis Field Research.—The Coal Board began this month a 10-year field investigation into the prevention of pneumoconiosis among miners. The objects are to discover what level of dustiness is safe for a miner who may spend his whole working life in the pits, and also whether the nature of the dust, such as its silica content, affects the safety level. It is also hoped to gain some idea of the true prevalence and rate of progression of pneumoconiosis in Britain. Twenty-four pits, with widely varying physical characteristics, have been chosen as representative and will be studied by scientists and doctors. Two medical teams, based on Edinburgh and Cardiff, are to carry out radiological surveys of the miners in these pits every two years, and their results will be correlated with the prevailing conditions of dustiness. The scheme is being directed by Dr. J. M. Rogan, C.M.O. of the Coal Board, and the scientific adviser is Dr. A. Cochran, of the Medical Research Council's Pneumoconiosis Research Unit.

Jenner Medal.—At the recent joint meeting of the Epidemiology Section of the Royal Society of Medicine and the Society of Medical Officers of Health (see p. 991) Sir Francis Walshe, F.R.S., president of the Royal Society of Medicine, presented the Jenner Medal to Mr. A. T. Glenny, F.R.S., for his notable work on diphtheria prophylaxis while a member of the research staff of Messrs. Burroughs Wellcome & Co. Mr. Glenny's experimental work prepared the way for the successful use of alum-precipitated toxoid in man. The Jenner Medal was founded in 1896 by the Epidemiological Society of London, and it has been awarded only 12 times.

Operations on the Frontal Lobes.—The Rockefeller Foundation has made a grant of £7,800 to London University for a three-year study of the psychological effects of frontal lobe operations. The study is being directed by Professor H. J. Eysenck, of the Institute of Psychiatry, who for the last 12 years has been working on the development of objective methods of measuring the personality. Other Rockefeller grants this quarter go to the Universities of Manchester (\$45,000 for research on the chemistry of biologically important materials), Cambridge (\$25,000 for equipment for the school of biochemistry), and Oxford (\$7,500 for equipment for work directed by Sir Howard Florey, F.R.S.).

Leverhulme Research Fellowships, 1954.—Application is invited for Fellowships and grants in aid of research. These awards are intended for senior workers prevented by routine duties from carrying out research. They are limited to British-born subjects normally resident in the United Kingdom, but in exceptional circumstances the condition as to residence may be waived. Applications from groups of workers engaged upon co-operative programmes of research (particularly if long-term) will also be considered. The duration of the awards will not normally extend over more than two years or less than three months, and the amount will depend on the nature of the research and the circumstances of the applicant. Forms of application may be obtained from the Secretary, Miss M. Branney, Leverhulme Research Fellowships, 3-5, Salisbury Square, London, E.C.4. The last date for applications is December 31, 1953. Awards will be announced in May and will date from September 1, 1954.

New Warning System for E.B.S.—The London Emergency Bed Service has modified its warning system to hospitals so as to make it a more sensitive index of the difficulty of obtaining beds. In calculating the rate (percentage of applicants admitted) no account will be taken in future of cases admitted through the medical referee. It is expected that this will result in the warnings being both issued earlier and cancelled later than in the past. A white warning will be sent out when the admission rate as now calculated falls to 85%, a yellow warning when it reaches 80%, and a red at 75%. In addition, at the request of the Ministry of Health, the white warning may be given even earlier still if there is reason to suppose that a serious epidemic is developing.

A Doctors' Orchestra.—Dr. H. Ucko's appeal for music-loving members of the medical and dental professions in London to join him in forming an orchestra (*Journal*, September 26, p. 727) has been successful, and the orchestra had its first rehearsal last week. At present it consists of 53 players—21 violins, 3 violas, 10 celli, 1 double bass, 2 flutes, 4 oboes, 6 clarinets, 1 bassoon, 2 horns, 1 trumpet, 1 trombone, and one player of tympani. More players are wanted in every category. Rehearsals will be held weekly on Thursdays, and anyone interested should communicate with Dr. Ucko at 14, Upper Wimpole Street, London, W.1.

Royal College of Physicians of Ireland.—On October 19 Dr. Edward T. Freeman was elected President of the College and Dr. J. A. Wallace Vice-President.

Dangerous Drugs.—On November 1 N-allylnormorphine will come within the provisions of Part III of the Dangerous Drugs Act, 1951.

Drawing Conventions for Laboratory Apparatus.—The British Standards Institution has circulated a draft British Standard for Drawing Conventions for Laboratory Apparatus. The last date for the receipt of comments (which should be sent to the British Standards Institution, 2, Park Street, London, W.1) is December 1.

Family Doctor.—The November issue of *Family Doctor* is now available. It contains articles on the interpretation of dreams (Dr. T. Traherne), pneumoconiosis, chiropody as a career, alcoholism (Dr. G. K. Selborne), and the infectious diseases of childhood (Dr. T. Anderson). Topical subjects discussed are the prevention of draughts and feeding the family in winter (Dr. A. Porter).

COMING EVENTS

College of General Practitioners.—The first annual general meeting of the College of General Practitioners will be held on Saturday, November 14, at 2 p.m., in the Great Hall, B.M.A. House, Tavistock Square, London, W.C.1. Foundation Membership and Associateship will close on that day. The agenda for this meeting and the first annual report of the College were dispatched to all members and associates on October 23. Will anyone who has not received them please communicate with the secretary?

Contraceptive Technique.—A lecture and demonstration will be given by Dr. Marie Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on November 5, at 2.30 p.m. Admission free, but tickets must be obtained in advance.

Smoke and "Smog."—An exhibition on smoke and "smog" will be open from November 9 to December 5 from 10 a.m. to 5 p.m. on Mondays to Fridays, and from 10 a.m. to 12 noon on Saturdays, at the Museum of Hygiene of the Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1. Admission free.

The British Association of Sport and Medicine.—A meeting will be held at 5 p.m. on November 11 in the Meyerstein Theatre of the Westminster Hospital Medical School, Horseferry Road, London, S.W.1. Dr. H. N. Bleasdale will speak on "The Health and Minor Maladies of Swimmers and Divers," and Dr. Michael Ward on "Some Medical Aspects of the Everest Expedition, 1953."

Empire Rheumatism Council.—The guest speakers at the symposium on "butazolidin" on November 13 (see *Journal*, August 15, 1953, p. 403) will be Dr. Otto Steinbrocker, of New York, and Professor Domenjos, of the University of Saarbrücken.

The London Medical Exhibition will be held in the new hall of the Royal Horticultural Society, Greycoat Street, London, S.W.1, from November 16 to 20. It will be open daily from 11 a.m. to 6.30 p.m. Lord Horder will perform the opening ceremony at 11.30 a.m. on November 16.

SOCIETIES AND LECTURES

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

Friday, October 30

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., clinical meeting for general practitioners. Mr. C. Gill-Carey: The Common Cold.

Monday, November 2

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: lecture-demonstration.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. William Evans: The Electrocardiogram in Cardiac Pain.

ROYAL EYE HOSPITAL.—5.30 p.m., Miss J. M. Dollar: Management of Diseases of the Uveal Tract.

Tuesday, November 3

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor E. C. Amoroso: Biology of the Foetal Membranes and the Placenta.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Viral Diseases of the Skin.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Arris and Gale Lecture by Mr. H. A. Haxton: Sympathetic Supply of the Upper Limb.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. M. H. E. Hulbert and Dr. W. M. Levitt: X-ray Therapy in Gynaecology.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. C. C. Edwards: neurological demonstration.

Wednesday, November 4

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Viral Diseases of the Skin.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. R. C. Higham: Enuresis.

MANCHESTER MEDICAL SOCIETY: SECTION OF MEDICINE.—At Medical School, Manchester University, 4.30 p.m., address by Dr. Denis Williams.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Dr. J. C. Gilson: Is Coal Dust Harmful to Man?

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—7.30 p.m., Mr. T. C. Denison, B.Pharm., Ph.C., F.R.I.C.: General Survey of the *British Pharmacopoeia*, 1953.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. F. V. Flynn: Na and K Metabolism.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Lord Amulree: Geriatrics.

SOCIETY OF APOTHECARIES OF LONDON.—4 p.m., Mr. J. B. Harman: Management of Inoperable Malignant Disease; 5.15 p.m., Dr. F. P. Lee Lander: Asthma and its Treatment.

Thursday, November 5

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. P. M. F. Bishop: Physiological Action of Sex Hormones.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Dr. D. K. Adams: Food in Relation to Health and Disease.

● INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY.—At National Hospital, Queen Square, W.C., 5.30 p.m., Dr. E. A. Carmichael: Hemiplegia: Clinical Types, Diagnosis and Treatment.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 3.30 p.m., Professor A. M. Clay: The Forceps in Present-day Practice.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Symposium to be opened by Mr. A. Sutcliffe Kerr: Management of Paraplegia.

LONDON UNIVERSITY.—At Royal Society of Medicine, 5 p.m., Semon Lecture by Professor F. C. Ormerod: The Management of Cancer of the Larynx.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—At Royal Society of Medicine, 2.15 p.m., 28th Maudsley Lecture by Earl Jowitt: Medicine and the Law.

ROYAL SOCIETY.—4.30 p.m., The Lecuwenhoek Lecture by Dr. K. M. Smith, D.Sc., F.R.S.: Some Aspects of the Behaviour of Certain Viruses in their Hosts and of their Development in the Cell.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor J. Glaister: Some Medico-Legal Trifles.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Denis Williams: neurology demonstration.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., demonstration of clinical cases; 5.15 p.m., discussion of clinical cases.

Friday, November 6

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. B. F. Russell: Pyogenic Infections.

● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor W. Melville Arnott: Peripheral Vascular Disease.

ROYAL EYE HOSPITAL.—4.30 p.m., Mr. A. J. Cameron: Recent Advances in Retinal Detachment Surgery.

Saturday, November 7

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—11.30 a.m., Professor E. Luscher (Basle): Physical Factors in Ear, Nose, and Throat Diseases.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 12 noon, Mr. J. A. Stallworthy: Genital Tuberculosis.

MIDLAND TUBERCULOSIS SOCIETY.—3 p.m., Professor J. McMichael: Pulmonary Heart Disease.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Barter.—On October 23, 1953, at Queen Charlotte's Hospital, London, W., to Marjorie (formerly Stavely), wife of Dr. Antony P. Barter, a daughter—Suzanne.

Fisher.—On October 22, 1953, at the Royal Maternity Hospital, Belfast, to Sheila, wife of Oliver D. Fisher, M.D., M.R.C.P., a daughter—Amanda Jane.

Solomons.—On October 2, 1953, in Dublin, to Joan (formerly Maitland), wife of Michael Solomons, M.R.C.O.G., a son.

Stok.—On October 13, 1953, at Liverpool Maternity Hospital, to Pauline (formerly Jones), wife of Dr. E. Theodor Stok, a son.

Swan.—On September 12, 1953, at the Civil Hospital, Aden, South-West Arabia, to Veronica (formerly Donnelly), wife of Thurloc Swan, M.Ch., F.R.C.S.I., a daughter—Oonagh Mary.

Any Questions?

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

Exchange Resins for Peptic Ulcer

Q.—What is the consensus on the status of anion exchange resins in the medical management of peptic ulcer? Which resin or type of resin is believed to be best, and in what dosage? Are there any toxic possibilities or contraindications?

A.—Anion exchange resins are large insoluble bases with the capacity to absorb the anion of an acid forming an insoluble resin salt; and in the alkaline small intestine the anion exchange is reversed. Amberlite 1 R-4 (particle size 200 mesh), a polyethylene polyamine substituted resin of diphenylol dimethyl methane and formaldehyde in basic form, has been used for the treatment of peptic ulcer, and up to 28 g. by mouth daily has been used without causing untoward effects.¹ The neutralizing efficiency is not impressive, comparable effects being obtained by 0.6 g. aluminium hydroxide and 3.2 g. of Amberlite 1 R-4, and there is evidence that it is in no way superior to other antacids. No definite ill effects have been noted, and constipation does not develop during its administration. Spears and Pfeiffer² found that all but one of a group of 30 patients experienced relief from pain, but this, however, was not synonymous with healing, and in some cases recurrence or complications occurred during treatment. Wirts, Sullivan, and Hammerly³ found that the effect of resin for duodenal ulcer was comparable to that of aluminium hydroxide gel, but did not notably surpass it. Similarly, Segal *et al.*⁴ achieved 65% clinical remission with chronic recurrent duodenal ulcer, but failed to get assistance in the more serious and protracted cases. On the whole, there seems remarkably little justification for its use in peptic ulcer.

REFERENCES

- 1 Kirsner, J. B., Palmer, W. L., Levin, E., and Klotz, A. P. (1951). *Ann. int. Med.*, 35, 785.
- 2 Spears, M. M., and Pfeiffer, M. C. J. (1947). *Gastroenterology*, 8, 191.
- 3 Wirts, C. W., Sullivan, B. H., and Hammerly, W. C. (1950). *Ibid.*, 15, 1.
- 4 Segal, H. L., Friedmann, H. A., Ellis, E. E., and Watson, J. S. (1950). *Amer. J. dig. Dis.*, 17, 293.

Liquid Paraffin and Cancer of Bowel

Q.—What is the origin of the view that the continued use of liquid paraffin may cause cancer of the bowel? It crops up from time to time and is invariably denied in the medical journals.

A.—The belief that the long-continued use of liquid paraffin by the mouth as an aperient conduces to cancer of the intestine has no doubt been encouraged by, if it did not arise from, the most unfortunate term "paraffin cancer" applied to occupational cancers of the skin occurring in workers exposed to shale oil, petroleum, or products derived from them. "Aniline cancer" is another most misleading title.

The word "paraffin" has at least two meanings: in chemistry it is a quite exact term denoting a class of compound of the general formula C_nH_{2n+2} ; while in everyday life and in commerce it may be applied to a variety of mineral oils, especially to those used for heating and lighting, which may consist to a large but not to a specific extent of paraffins conforming to the chemical definition.

One may perhaps take some data, which are still relevant, from a paper published many years ago "On the Cancer-producing Factor in Tar" by E. L. Kennaway.¹ In the lignite tar and shale oil industries the workmen who have most to do with the most concentrated forms of chemical

paraffins are the least liable to affections of the skin. High-temperature coal tar, which, together with its pitch, produces far more cases of industrial cancer than do all other materials put together, is especially poor in paraffins, and contains less of them than does non-carcinogenic blast-furnace tar. The petroleum of Pennsylvania, Canada, Galicia, and Rumania contain especially large amounts (up to 85%) of chemical paraffins, but are not distinguished by producing many cases of petroleum cancer. Prosser White² says, "The writer has watched women and girls employed all their working hours, year after year, bedaubed with refined paraffin wax free from impurities, none of whom have ever experienced the least trace of inconvenience or distress."

So far as the writer knows, there is no evidence that the medicinal "liquid paraffin" taken by mouth has any carcinogenic action upon the alimentary tract or upon any other organs. The proverbial difficulty of proving a negative of course presents itself here. Anyone interested in this question could tabulate the deaths from cancer of various parts of the intestine given in the annual *Statistical Reviews* of the Registrar-General, and the standardized death rate given from time to time in these publications, beginning at the time when the ingestion of liquid paraffin became common. Possibly this date was somewhere about 1910, when "intestinal stasis" was very generally discussed and was alleged to be the cause of at least one common form of cancer. But no doubt the records of pharmaceutical firms would give the information required. If we have no data showing a direct carcinogenic action of paraffins upon the alimentary tract, we have no more, so far as I know, indicating any indirect action of this kind due to interference with the absorption of fat-soluble substances.

The name "paraffin" does not occur among the immense number of compounds named in Hartwell's *Survey of Compounds which have been Tested for Carcinogenic Activity*.³

REFERENCES

- ¹ *British Medical Journal*, 1924, 1, 564.
- ² White, R. P., *The Dermatogoses or Occupational Affections of the Skin*, 2nd ed., London, 1920, p. 143.
- ³ Hartwell, J. L., *Survey of Compounds which have been Tested for Carcinogenic Activity*, 2nd ed., Bethesda, Federal Security Agency, 1951.

Prevention of Amoebic Dysentery

Q.—Is the chemoprophylaxis of amoebic dysentery a practicable procedure? If so, what drugs are recommended, and are there any dangers?

A.—The chemoprophylaxis of amoebic dysentery is not a practicable procedure. If normal hygienic precautions in relation to food and drink are adopted, the risk of contracting amoebic dysentery is remote, and it is by such measures that infection should be avoided. Even if they had an effective prophylactic action, which is doubtful, amoebicidal drugs are not suitable for indefinitely repeated administration.

Antiseptics for Surgical Theatres

Q.—What antiseptics are recommended for (a) the storage of previously sterilized sharp instruments so that they can be used at a moment's notice; (b) the washing of basins, trolleys, and operating theatre floors? Do antiseptics have any advantages over soap or detergent and water for the latter purposes?

A.—(a) Liquor boracis et formaldehydi (borax 1.5 g., solution of formaldehyde 2.5 ml., phenol 0.4 g., water to 100 ml.) is effective. It is completely bactericidal (sporicidal effect included) and non-rusting. Instruments placed in it require rinsing in sterile water before use, and irritating vapour from it may be a drawback. Spirit, commonly used for this purpose, is at least theoretically unsatisfactory because it is not completely bactericidal; it may even contain living bacterial spores.

(b) Operating theatre furniture and floors which have been contaminated with septic material should be swabbed with a strong phenolic disinfectant such as 5% phenol or 2% lysol; this should be given 15 minutes to act before being

washed off. Unless any such specific contamination has occurred the use of disinfectants has no advantage over washing with soap and water. The practice of adding small quantities of odoriferous disinfectants to water used for washing is wasteful and useless; the amount required to produce an antiseptic smell is only a small fraction of that which would be necessary actually to disinfect.

Milk for Tuberculous Patients

Q.—I should be pleased to know the modern opinion regarding the value of milk for tuberculous cases. Is it given because it is an easily assimilable type of food, because of its relevantly high calcium content, or is it a medical fashion which has continued without any really sound therapeutic basis?

A.—The value of milk for tuberculous patients lies in the fact that it is a well-balanced food which is easily assimilated. It is of most value to the really ill patient, who may be able to take it more easily than an equivalent amount of solid food. During the rationing period, when protein foods suffered the greatest reductions, the allowance of two pints (1.1 litres) of milk daily to tuberculous patients was a wise provision, and until meat rationing is abolished patients with active pulmonary tuberculosis should be encouraged to take this amount of milk. On the other hand, if milk forms too large a part of the diet it is expensive and often indigestible, so that patients should be made aware that it possesses no specific virtues as a food in pulmonary tuberculosis.

Indrawn Nipples in Children

Q.—One of my daughters aged 9—healthy in every way—is showing signs of developing indrawn nipples. Is there any way of preventing this as she grows older?

A.—It is probably impossible to assess the situation accurately at such a young age, and post-pubertal development of the breasts may well alter the picture. In any case, nothing useful can be done now, and any attempt at treatment might well have unfortunate psychological effects on the girl; the condition should not even be brought to her notice. The question of treatment should be deferred until she is adult, and, in the writer's view, until she is pregnant.

NOTES AND COMMENTS

Corrections.—In the article by Mr. Patrick Clarkson and Mr. D. A. Campbell Reid entitled "Use of the Electrodermatome, with Special Reference to its Value in Serious Burns" (October 3, p. 763) the name Padgett in the first paragraph was wrongly spelt Paget. There was also a misprint in the description of the instrument. The current required to operate the instrument is 110 volts, not 10 volts as stated.

Mr. N. J. Ainsworth asks us to correct a statement in his appreciation of the late Mr. J. H. Badcock (*Journal*, October 24, p. 943). Mr. Badcock was not "the last remaining member of that group of great dental surgeons and teachers . . ." but only one of the last of the remaining members of that group, of which happily there are some still alive and well.

Sir Ewen Maclean was mistakenly said in our last issue (p. 941) to have provided the only instance of a Chairman of the Representative Body becoming President. Sir Henry Souttar held both these offices, and he has the distinction of also being an ex-Chairman of Council.

All communications with regard to editorial business should be addressed to the EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London*. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London*. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

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ISONIAZID IN COMBINATION WITH STREPTOMYCIN OR WITH P.A.S. IN THE TREATMENT OF PULMONARY TUBERCULOSIS

FIFTH REPORT TO THE MEDICAL RESEARCH COUNCIL BY THEIR TUBERCULOSIS CHEMOTHERAPY TRIALS COMMITTEE*

The Medical Research Council trial of isonicotinic acid hydrazide (isoniazid) in the treatment of pulmonary tuberculosis has been in progress since March, 1952; reports comparing clinical and bacteriological findings in patients treated with streptomycin plus P.A.S., isoniazid alone, and streptomycin plus isoniazid, and a report on bacteriological techniques, have already been published (Medical Research Council, 1952, 1953a, 1953b, 1953c). The present report compares the effects of two combinations of drugs—streptomycin plus isoniazid and P.A.S. plus isoniazid—on a total of 391 patients after three months' treatment in 50 hospitals. A list of the hospitals, and the names of the co-operating clinicians, bacteriologists, and pathologists, are given at the end of the report. The trial was co-ordinated by the late Dr. Marc Daniels and by Dr. Wallace Fox, of the Council's Tuberculosis Research Unit; Dr. Fox and Dr. Ian Sutherland (of the Council's Statistical Research Unit) analysed the present results and prepared the report. Radiological assessments were made by Dr. L. G. Blair. The isoniazid used throughout the trial has been supplied as "nydrazid" by E. R. Squibb and Sons.

I. PLAN AND CONDUCT OF THE TRIAL

The plan and conduct of the trial are only briefly referred to here, as they have been described in detail in the first two reports (Medical Research Council, 1952, 1953a).

1. Type of Case

Certain basic requirements were laid down for all cases accepted into the trial. At the start of treatment: (a) Tubercle bacilli must have been demonstrated, either in a direct smear from a sputum specimen taken within the previous two weeks or in a culture derived from a specimen taken not more than two months previously. (b) The tubercle bacilli must not, so far as is known, be streptomycin-resistant or P.A.S.-resistant. (c) The patient must not have had more than 15 g. streptomycin or 300 g. P.A.S. (sodium salt) within the previous three months, and not more than 3 g. isoniazid at any time. (d) The patient must not be undergoing pneumoperitoneum, nor have any form of collapse therapy for the lung requiring treatment.

*Members of the Committee: Sir Geoffrey Marshall (chairman), Professor J. W. Crofton, Professor R. Cruickshank, Dr. J. E. Geddes, Professor F. R. G. Heaf, Professor A. Bradford Hill, Dr. J. V. Hurford, Dr. D. A. Mitchison, Dr. W. D. M. Paton, Dr. J. G. Scadding, Dr. Norman Smith, Dr. P. D'Arcy Hart (secretary).

Cases satisfying the above requirements were admitted to the trial in one of three main disease groups: (1) acute rapidly progressive pulmonary tuberculosis believed to be of recent origin; (2) other forms of pulmonary tuberculosis considered suitable for chemotherapy; (3) chronic forms of pulmonary tuberculosis expected to make only a limited response to streptomycin plus P.A.S.

Group 1 cases were selected by a central panel of clinicians; cases in Groups 2 and 3 were, in the main, selected by the clinicians in the co-operating hospitals from the patients already under their care.

2. Treatment

When a patient has been accepted for the trial, treatment is allocated by the Tuberculosis Research Unit from confidentially held prearranged lists based upon random sampling numbers.

After admission to the trial and a preliminary week of investigation, all patients are kept under observation for six months. During the first three months the prescribed treatment is followed for every patient. During the second three months Group 3 patients continue on the same combination of drugs. For other patients the clinician is free to undertake any treatment he wishes.

In the present phase of the trial, which started on September 5, 1952, four treatments are being studied—namely:

SH: Streptomycin 1 g. daily, in one intramuscular injection, plus isoniazid 200 mg. daily, in two equal doses by mouth.

S2H: Streptomycin 1 g., in one intramuscular injection, twice a week, plus isoniazid 200 mg. daily, in two equal doses by mouth.

20 PH: P.A.S. (sodium salt) 20 g. daily, in four equal doses by mouth, plus isoniazid 200 mg. daily, in two equal doses by mouth.

10 PH: P.A.S. (sodium salt) 10 g. daily, in two equal doses by mouth, plus isoniazid 200 mg. daily, in two equal doses by mouth.

In one important disease subgroup (1A—acute rapidly progressive bilateral pulmonary tuberculosis of recent origin, in patients between the ages of 15 and 30) patients have been allocated only to the SH and 20 PH series. Every other patient has been allocated at random to one of the four treatment series.

The present report analyses the results after three months' treatment for 391 patients admitted to the trial

between September 5, 1952, and March 31, 1953. Over 200 more patients were admitted to the same four treatments between April 1 and July 31, 1953, when admissions to the trial were discontinued; the three-month results for these latter patients are not yet complete. It should also be noted that the results for the 142 SH patients previously reported (Medical Research Council, 1953a) do not appear in the present analysis because they formed part of an earlier comparison.

3. Number of Patients in the Present Analysis

Prior to exclusions, 125 patients were allocated to the SH treatment, 104 to S2H, 121 to 20 PH, and 82 to 10 PH. The larger totals in the SH and 20 PH series are accounted for by patients in subgroup 1A. The number of patients allocated to the S2H series is not intentionally larger than the number in the 10 PH series; the difference has arisen by chance as a result of the operation of random allocation in the 50 hospitals.

Forty-one patients were excluded from the analysis of the results for the following reasons:

- (i) Five patients were excluded before treatment was started:
 - 1 died before admission to hospital (20 PH);
 - 1 was too ill to be moved to hospital (S2H);
 - 2 discharged themselves against medical advice (2 20 PH);
 - 1, although admitted, did not start treatment, because no positive sputum was obtained (SH).
- (ii) Thirty-six patients were excluded after treatment had begun:
 - 2 were found to have had organisms resistant to streptomycin at the start of treatment (2 SH);
 - 4 were found to have had organisms resistant to P.A.S. at the start of treatment (3 20 PH, 1 10 PH);
 - 6 were found to have had excessive recent chemotherapy (1 S2H, 4 20 PH, 1 10 PH);
 - 1 was given the wrong treatment (20 PH);
 - 11 discharged themselves against medical advice—6 in the first and 5 in the second month (1 SH, 2 S2H, 2 20 PH, 6 10 PH);
 - 2 were transferred to other hospitals in the first month for investigations of non-pulmonary complaints (1 20 PH, 1 10 PH);
 - 1 was transferred to a mental hospital with a psychosis, in the second month (10 PH);
 - 3 had severe toxic reactions attributed to P.A.S. (3 20 PH);
 - 2 stopped treatment in the second month, one because of acute nephritis, the other because of persistent haemoptysis believed to be related to treatment (2 SH);
 - 2 had a change of treatment in the first month: for one 10 PH patient streptomycin was added after eight days, and the dosage of P.A.S. was doubled, because of the serious clinical condition; this case can scarcely be considered a failure of the prescribed chemotherapy; in one 20 PH patient streptomycin was added after 18 days because of radiographic deterioration; this patient had

1-minus deterioration at one month, and the deterioration at three months was still classed as 1-minus; despite the short period of treatment, this may represent a failure of the prescribed chemotherapy;

2 had a change of treatment in the second month (2 20 PH): one patient had deteriorated both clinically and radiographically and the treatment was changed to SH at six weeks; at ten weeks a radiograph showed 1-plus improvement compared with the condition on admission; the other patient deteriorated radiographically and streptomycin was added at six weeks, but there was 2-minus deterioration at three months.

Thus in the present series only 3 patients were removed from the trial because of drug toxicity; all were receiving 20 PH and were intolerant to the P.A.S. In 2 more (2 SH) drug toxicity could not be excluded as the cause of acute nephritis in one and persistent haemoptysis in the other, although in the latter patient the same chemotherapy was resumed after an interruption of five weeks without a recurrence of the haemoptysis.

Of the 4 patients in whom treatment was changed, 2, and possibly a third, all on 20 PH, might be classed as failures of treatment. On the other hand, it must be remembered that the combination P.A.S. plus isoniazid was a new treatment; it would be a natural inclination for clinicians to resort to a combination containing streptomycin for patients who deteriorated.

4. Plan of the Present Report

After the exclusions detailed above, the numbers remaining in the clinical analysis are 119 SH, 100 S2H, 101 20 PH, and 71 10 PH patients. The numbers in each disease group are set out in Table I. It should be noted, first, that in contrast to the earlier reports on the trial the total of very chronic patients (Group 3) is small and that the proportion of patients admitted to the trial who were suffering from acute forms of the disease has been higher in recent months than in earlier stages. Secondly, since patients in subgroup 1A (acute bilateral disease in young adults) were admitted only to the SH and 20 PH treatment series, a valid comparison of the relative clinical efficacy of all four treatments SH, S2H, 20 PH, and 10 PH can be made only after excluding the patients in subgroup 1A. When this is done, the clinical results of the four treatments are at present very similar, although the numbers of patients are too small for firm conclusions to be reached. A full comparison of the four treatments will be made when results on a larger number of patients are available.

In this report two comparisons are made. First, the clinical progress of patients on the SH and 20 PH treatments is compared, and for this purpose the 70 patients in sub-

TABLE I.—Number of Patients Admitted to the SH, S2H, 20 PH, and 10 PH Treatments from September 5, 1952, to March 31, 1953 (after exclusions)

	Treatment				All Patients
	SH	S2H	20 PH	10 PH	
	Streptomycin 1 g. Daily Plus Isoniazid 200 mg. Daily	Streptomycin 1 g. Twice a Week Plus Isoniazid 200 mg. Daily	P.A.S. (Sodium) 20 g. Daily Plus Isoniazid 200 mg. Daily	P.A.S. (Sodium) 10 g. Daily Plus Isoniazid 200 mg. Daily	
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	39	25	31	23	70
Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	52	67	45	44	208
Group 3: Chronic forms of pulmonary tuberculosis expected to make only a limited response to chemotherapy	3	8	8	4	23
All patients	119	100	101	71	391

group 1A are included, but the 11 Group 3 patients are omitted because of their small number and unequal distribution between the two treatments; this leaves 116 SH patients and 93 20 PH patients. The results are presented in Section A of Tables II-VII. Secondly, a supplementary comparison of streptomycin plus isoniazid and P.A.S. plus isoniazid on a large number of patients is made by combining all the SH and S2H patients, numbering 219, and comparing their progress with that of all the 20 PH and 10 PH patients, numbering 172. Group 3 patients have been retained in this broad comparison, the results of which appear in Section B of Tables II-VII.

II. CLINICAL PROGRESS

1. Condition on Admission

The treatment which patients had received before entering the trial was analysed. Eight patients on SH (7%), 8 on S2H (8%), 6 on 20 PH (6%), and 3 on 10 PH (4%) had already received one or more courses of chemotherapy, but not within the preceding three months. For the patients in Groups 1 and 2 combined, the figures for the four treatments are 7 (6%), 4 (4%), 2 (2%), and 2 (3%), respectively. Thus most of the patients in the present analysis were receiving their first course of chemotherapy in this trial. Most were also newly diagnosed cases.

Table II shows the condition of patients before the start of treatment as reflected by their general condition (assessment by the clinician in charge), temperature, erythrocyte sedimentation rate (E.S.R. Westergren 200 mm. reading at one hour), and the extent of cavitation on a full-plate radiograph (as estimated by an independent radiological assessor, unaware of the treatment series of any patient). It can be seen that, judging by the factors listed, the SH and 20 PH patients (Section A of the Table) had a broadly similar distribution of severe and less severe illness, but that, particularly in Group 2, the SH patients appear to have been, on the average, rather less ill than the 20 PH patients. This possible disadvantage to the 20 PH treatment must be borne in mind in assessing the results. The patients in the SH and S2H series combined (Section B of the Table) had a distribution of severe and less severe illness similar to that of the 20 PH and 10 PH patients.

2. Mortality

There were two deaths among the 391 patients (0.5%) during the three months of treatment—one in an SH patient, the other in a 20 PH patient. The SH patient (in Group 1) died towards the end of the third month with renal failure secondary to acute nephritis, confirmed at post-mortem examination. This patient had slight clinical and radiographic deterioration at one month and showed further clinical and radiographic deterioration at the end of two months. The nephritis was diagnosed in the third month. The 20 PH patient (in subgroup 1A) rapidly deteriorated, and treatment was stopped after 20 days because the patient was incapable of swallowing; she died 10 days later.

3. Toxicity

Apart from the 3 exclusions due to P.A.S. toxicity, and the 2 doubtful toxic reactions described above, there is nothing new to report on toxicity. With the dosage used (200 mg. daily), there continues to be no evidence of serious toxicity from isoniazid therapy over a three-month period of administration. In one 20 PH patient treatment was stopped after 10 weeks because the leucocyte count fell progressively from 4,400 per c.mm. to 1,800 per c.mm., although the differential count remained normal. It was considered undesirable to continue chemotherapy, but the patient has been retained in the analysis at three months.

4. The Comparison between SH (Streptomycin 1 g. Daily Plus Isoniazid 200 mg. Daily) and 20 PH (P.A.S., Sodium Salt, 20 g. Daily Plus Isoniazid 200 mg. Daily)

General Condition.—Change in the patient's general condition was assessed by the physician in charge. Section A of Table III shows that a high percentage of patients on each treatment improved—89% of 116 SH patients and 88% of 93 20 PH patients. With each treatment there were more patients with 2-plus (considerable) improvement in Group 1 than in Group 2.

Weight Changes.—The weight changes for the three-month period are set out in Section A of Table IV. Only 6 of 113 SH patients (5%) and 9 of 90 20 PH patients (10%) failed to gain weight. A gain of 14 lb. (6.4 kg.) or more occurred in 45% of SH patients and 38% of 20 PH patients, and

TABLE II.—Condition on Admission of Patients Treated with Isoniazid in Combination with Streptomycin or with P.A.S.

		Treatment	Total	General Condition			Average Evening Temperature in Pre-treatment Week*				Erythrocyte Sedimentation Rate (Westergren 200 mm. Reading at 1 Hour)				Extent of Cavitation†			
				Good	Fair	Poor	Afebrile	Under 99° F.	99-99.9° F.	100° F. or more	0-10	11-20	21-50	51 or more	Nil	1-plus	2-plus	3-plus
				No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %
Section A	Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SH	64 100	14 22	26 41	24 38	20 31	18 28	16 25	10 16	5 8	6 9	25 39	28 44	9 14	13 20	30 47	12 19
		20 PH	48 100	8 17	19 40	21 44	11 23	20 42	10 21	7 15	2 4	3 6	21 44	22 46	5 10	15 31	21 44	7 15
	Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	SH	52 100	24 46	19 37	9 17	34 65	11 21	5 10	2 4	16 31	10 19	18 35	8 15	15 29	20 38	16 31	1 2
		20 PH	45 100	12 27	17 38	16 36	20 44	15 33	6 13	4 9	10 22	10 22	17 38	8 18	13 29	14 31	5 11	
Section B	Groups 1 and 2 combined	SH	116 100	38 33	45 39	33 28	54 47	29 25	21 18	12 10	21 18	16 14	43 37	36 31	24 21	33 28	46 40	13 11
		20 PH	93 100	20 22	36 39	37 40	31 33	35 38	16 17	11 12	12 13	13 14	38 41	30 32	18 19	30 33	35 38	12 13
	All patients in Groups 1, 2, and 3 combined	SH and S2H	219 100	74 34	85 39	60 27	99 45	66 30	31 14	23 11	39 18	33 15	81 37	66 30	44 20	66 30	81 37	28 13
		20 PH and 10 PH	172 100	46 27	69 40	57 33	67 39	57 33	30 17	18 10	27 16	24 14	70 41	50 29	44 26	49 28	62 36	17 10

* A patient was considered afebrile if every evening temperature in the pre-treatment week of investigation was below 99° F. (37.2° C.).

† Assessment on a single full-plate chest radiograph taken before treatment started. Tomograms were not taken into account.

‡ The sedimentation rate of one patient was not recorded.

the average weight gain for the former was 12.8 lb. (5.8 kg.), for the latter 10.8 lb. (4.9 kg.). These differences for Groups 1 and 2 combined do not attain statistical significance. However, in Group 1 alone, the difference in average weight gain is significant at the 1% level.

Temperature.—A patient was considered to be initially afebrile if the evening temperature was below 99° F. (37.2° C) on every day of the week of preliminary investigation. The same definition applied in the last week of the third month of treatment. Table V sets out the number of patients who were febrile in the pre-treatment week but afebrile at three months. The patients are grouped according to the initial level of pyrexia. Of 61 febrile SH patients, 79% were afebrile at three months, compared with 85% of the same number of febrile 20 PH patients. Of 54 SH patients who were afebrile in the pre-treatment week (not shown in the Table), 8, or 15%, had a low-grade pyrexia at three months (an occasional evening temperature above 99° F.). The corresponding figures for the 20 PH patients were 4 of 31, or 13%.

Sedimentation Rate.—Table VI sets out the number of patients with an initially elevated E.S.R. which was lowered to normal (10 or less) after three months' treatment. The E.S.R. was normal at the end of three months in 37% of 78 SH patients with an initial E.S.R. of 21 or more. The corresponding figures for the 20 PH series were 46% of 67 patients. The difference is not statistically significant. The E.S.R. rose from an initially normal level in 2 of 21 SH patients and 2 of 12 20 PH patients.

Radiographic Changes in the First Three Months.—Table VII sets out the radiographic changes at the end of three

months' treatment. The assessments were made at an independent reading of full-plate chest radiographs by a radiologist unaware of the treatment of any patient. In assessing improvement or deterioration three degrees were allowed in each—namely, 1-plus, 2-plus, and 3-plus, and 1-minus, 2-minus, and 3-minus. Of 116 SH patients 82% improved radiographically, compared with 76% of 93 20 PH patients. Two-plus and 3-plus improvement was more frequent under the SH treatment (54%) than the 20 PH treatment (42%). In Group 1, 23% of 64 SH patients showed 3-plus (considerable) improvement compared with 10% of 48 20 PH patients. These differences do not attain statistical significance. In all, there were two radiographic deteriorations and one death on each treatment.

Summary of the Comparison of SH with 20 PH

At the end of three months the two treatments had very similar effects on the general condition of the patient and on the temperature. The 20 PH treatment may have been slightly the more effective in lowering the E.S.R., and the SH treatment in fostering weight gain. Judging from the important assessment of radiographic response, the SH treatment appears to have been rather more effective, particularly in the cases with acute extensive disease in Group 1. The 20 PH patients were on an average more ill than the SH patients on admission to the trial (Table II), and so may have started at a disadvantage. On the other hand, it will be recalled that 3 20 PH patients, who deteriorated and had their treatment changed, were excluded from the analysis.

TABLE III.—General Condition at the End of the Third Month Compared with General Condition on Admission

		Treatment	Total		Improvement				No Change		Deterioration				Death	
					2-plus		1-plus				1-minus		2-minus			
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Section A	Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SH	64	101	27	42	33	52	3	5	0	0	0	0	1	2
		20 PH	48	100	22	46	21	44	4	8	0	0	0	0	1	2
	Group 2: Other forms of pulmon- ary tuberculosis suit- able for chemotherapy	SH	52	100	13	25	30	58	9	17	0	0	0	0	0	0
		20 PH	45	100	13	29	26	58	6	13	0	0	0	0	0	0
	Groups 1 and 2 combined	SH	116	99	40	34	63	54	12	10	0	0	0	0	1	1
		20 PH	93	101	35	38	47	51	10	11	0	0	0	0	1	1
Section B	All patients in Groups 1, 2, and 3 combined	SH and S2H	219	99	71	32	123	56	23	11	1	0	0	0	1	0
		20 PH and 10 PH	172	100	59	34	93	54	19	11	0	0	0	0	1	1

TABLE IV.—Weight Changes in the First Three Months

		Treatment	Total Weighed	Weight Gain				No Change	Weight Loss		Average Gain in Weight per Patient (lb.)	
				21 lb. or More	14-20 lb.	7-13 lb.	Less than 7 lb.		Less than 7 lb.	7 lb. or More		
				No. %	No. %	No. %	No. %	No. %	No. %			
Section A	Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SH	62	14	20	18						14.4
		20 PH	47 101 99	6 23 13	11 32 23	14 29 30	8 13 23	0 0 2	1 2 6	1 2 0	10.2	
	Group 2: Other forms of pulmon- ary tuberculosis suit- able for chemotherapy	SH	51	7	10	17	13	2	1	1		10.8
		20 PH	43 100	5 14 12	12 20 28	12 33 28	10 25 23	0 4 0	4 2 9	0 2 0		11.4
	Groups 1 and 2 com- bined	SH	113	21	30	35	21	2	2	2		12.8
		20 PH	90 102 100	11 19 12	23 27 26	26 31 29	21 19 23	2 2 2	7 2 8	0 2 0		10.8
Section B	All patients in Groups 1, 2, and 3 combined	SH and S2H	214	40	66	65	33	3	5	2	13.4	
		20 PH and 10 PH	99 168 100	19 25 15	31 41 24	30 50 30	15 37 22	1 4 2	2 10 6	1 1 1	11.6	

For two other patients on SH, two on S2H, two on 20 PH, and one on 10 PH the weight changes are not available. Also one SH patient and one 20 PH patient had died. (7 lb. = 3.2 kg. 14 lb. = 6.4 kg. 21 lb. = 9.5 kg.)

TABLE V.—Number of Cases Febrile in the Pre-treatment Week who were Afebrile at the End of the Third Month

TABLE V.—Number of Cases Febrile in the Pre-treatment Week										
		Treatment	Average Evening Temperature in the Pre-treatment Week						All Patients Febrile in the Pre-treatment Week	
			Under 99° F.		99° F. - 99.9° F.		100° F. or More		Total	Afebrile at Three Months
			Total	No. Afebrile at Three Months	Total	No. Afebrile at Three Months	Total	No. Afebrile at Three Months		
Section A	Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SH	18	15	16	14	9	6	43	35 81
		20 PH	20	19	10	9	6	4	36	32 89
	Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	SH	11	10	5	2	2	1	18	13 72
		20 PH	15	14	6	4	4	2	25	20 80
	Groups 1 and 2 combined	SH 20 PH	29 35	No. %	21 16	No. %	11 10	No. %	61 61	48 79 52 85
				25 86 33 94		16 76 13 81		7 64 6 60		
Section B	All patients in Groups 1, 2, and 3 combined	SH and S2H 20 PH and 10 PH	66	56 85	31	21 68	22	12 55	119	89 75
			57	48 84	30	25 83	17	10 59	104	83 80

One SH and one 20 PH patient, who died, are excluded from this table.

TABLE VI.—Number of Cases with a Raised Erythrocyte Sedimentation Rate in the Pre-treatment Week Whose Sedimentation Rate was Normal at the End of the Third Month

Sedimentation Rate in the Pre-treatment Week										All Cases with Initial Sedimentation Rate of 21 or More	
Treatment	11-20		21-50		51 or More		Total	E.S.R. of 0-10 at 3 Months	Total	E.S.R. of 0-10 at 3 Months	
	Total	No. with E.S.R. 0-10 at 3 Months	Total	No. with E.S.R. 0-10 at 3 Months	Total	No. with E.S.R. 0-10 at 3 Months					
Section A	Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SH	6	4	24	13	28	4	52	17	33
		20 PH	3	3	20	14	22	7	42	21	50
	Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	SH	10	9	18	11	8	1	26	12	46
		20 PH	10	8	17	10	8	0	25	10	40
	Groups 1 and 2 combined	SH	16	No. %		No. %		No. %			
		20 PH	13	13 81	42 37	24 57 24 65	36 30	5 14 7 23	78 67	29 31	37 46
Section B	All patients in Groups 1, 2, and 3 combined	SH and S2H	33	27 82	79	43 54	66	12 18	145	55 38	
		20 PH and 10 PH	24	19 79	69	38 55	50	13 26	119	51 43	

For one other SH patient the sedimentation rate at three months is not available. Also one SH and one 20 PH patient had died.

TABLE VII.—Changes in Radiographic Appearances in the First Three Months

		Treatment	Total	Improvement			No Change	Deterioration			Death
				3-plus	2-plus	1-plus*		1-minus	2-minus	3-minus	
				No. %	No. %	No. %		No. %	No. %	No. %	
Section A	Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin	SH	64	15	22	19	5	1	1	0	1
	20 PH	48	5	16	16	9	1	0	0	1	
		101	23	34	30	8	2	2	0	2	
		99	10	33	33	19	2	0	0	2	
Section A	Group 2: Other forms of pulmon- ary tuberculosis suit- able for chemotherapy	SH	52	12	14	13	13	0	0	0	0
	20 PH	45	9	9	16	10	1	0	0	0	
		100	23	27	25	25	2	0	0	0	
		100	20	20	36	22	2	0	0	0	
Section A	Groups 1 and 2 combined	SH	116	27	36	32	18	1	1	0	1
	20 PH	93	14	25	32	19	2	0	0	1	
Section B			99	15	27	34	20	2	0	0	1
	All patients in Groups 1, 2, and 3 combined	SH and S2H	219	40	68	61	42	2	5	0	1
20 PH and 10 PH		172	25	41	61	38	5	1	0	1	
		101	15	24	35	22	3	1	0	1	

The x-ray films were subsequently lost.

* The assessments for one SH and one 10 PH patient were made by the clinician in charge. The x-ray films were subsequently lost.

5. The Comparison between Streptomycin Plus Isoniazid (SH and S2H) and P.A.S. Plus Isoniazid (20 PH and 10 PH)

General Condition.—Section B of Table III shows that the majority of patients—89% of 219 SH and S2H patients, and 88% of 172 20 PH and 10 PH patients—improved clinically.

Weight Changes.—Section B of Table IV shows that the average gain in weight of 214 SH and S2H patients was 13.4 lb. (6.1 kg.) and that 50% gained 14 lb. (6.4 kg.) or more. The average gain in weight for 168 20 PH and 10 PH patients was 11.6 lb. (5.3 kg.); of these patients 39% gained 14 lb. or more. The difference in average weight gain is significant at the 5% level.

Temperature.—Of 119 pyrexial SH and S2H patients 75% became afebrile, compared with 80% of 104 20 PH and 10 PH patients (Table V). Of 99 initially afebrile SH and S2H patients 11% showed a low-grade pyrexia at three months, compared with 9% of 67 20 PH and 10 PH patients.

Sedimentation Rate.—In 145 SH and S2H patients with an initial E.S.R. of 21 or more there was a fall to normal (10 or less) in 38%. For 119 20 PH and 10 PH patients the corresponding figure was 43% (Table VI). In 39 SH and S2H patients with an initially normal E.S.R. there was a rise to 11 or more at three months in 10%, compared with 7% of 27 20 PH and 10 PH patients.

Radiographic Changes in the First Three Months.—The percentages showing radiographic improvement were 77% of 219 SH and S2H patients, and 74% of 172 20 PH and 10 PH patients (Table VII). A higher proportion of the SH and S2H patients showed 2-plus and 3-plus improvement (49%) than of those on 20 PH and 10 PH (38%), the difference between these percentages being significant at the 5% level.

Summary of the Comparison of Streptomycin Plus Isoniazid With P.A.S. Plus Isoniazid

The patients on streptomycin plus isoniazid gained a little more weight and a higher proportion showed substantial radiographic improvement. In other respects the three-month results in the two treatment series are similar.

III. BACTERIOLOGY

This section presents an analysis of the bacteriological findings in those patients whose clinical progress has been reported above. The bacterial content of the sputum is studied after one, two, and three months of treatment. Evidence on the development of bacterial resistance after two and three months of treatment is presented. Resistance to

isoniazid is studied for patients under each of the four treatments, to streptomycin for SH and for S2H patients, and to P.A.S. for 20 PH and for 10 PH patients.

The procedure for taking specimens, the technique for sensitivity tests to each of the three drugs, and the definitions of resistance and sensitivity have been described in detail in previous reports (Medical Research Council, 1953a, 1953b). The examinations of bacteriological specimens and the sensitivity tests to isoniazid and to streptomycin were performed in the co-operating laboratories. The P.A.S. sensitivity tests on cultures from the 20 PH and 10 PH patients were all performed in the reference laboratory (see Acknowledgments).

The result of a bacteriological examination, or of a sensitivity test, for a given month was accepted only if it was performed on a specimen collected not more than seven days before or after the appropriate date. When more than one such result was available, the one referring to a specimen taken on or nearest to the appropriate date was selected to avoid bias. Thus in all the bacteriological tables each item represents a number of patients for each of whom a single test has been selected, and not a total of all the tests performed on a smaller number of patients.

1. Exclusions

In addition to the patients already excluded from the clinical analysis, a further 5 patients (3 SH, 1 S2H, 1 10 PH) have been excluded from the bacteriological analysis. No tubercle bacilli were seen or isolated from pre-treatment specimens for any of these patients, and although there was no doubt of the diagnosis they did not conform to the bacteriological requirements on entry to the trial. It will be recalled that 6 patients were excluded because they were found to have had bacilli resistant to at least one of the drugs on entry to the trial. The bacteriological as well as the clinical analysis is thus confined to patients whose organisms were sensitive at the start of the trial to both of the drugs they were receiving.

2. Bacterial Content of Sputum

The results at one, two, and three months of the selected single examinations of the sputum for tubercle bacilli are set out in Table VIII. At the end of one month's treatment specimens from 32% of 111 SH patients and 27% of 89 20 PH patients, in Groups 1 and 2 combined, were negative both on direct examination and on culture. At the end of the second month the corresponding figures were 51% of 104 SH patients and 43% of 91 20 PH patients. At three months the figures were 65% of 106 SH patients and 66% of 89 20 PH patients. The figures for the two treatments are ver-

TABLE VIII.—Presence of Tubercle Bacilli at Single Examinations Made at Monthly Intervals

	Months after Entry to Trial	Treatment	Total Patients Examined		"Positive" Direct Examination†		"Scanty Positive" Direct Examination*†		Direct Examination Negative and Culture Positive; or Laryngeal Swab Positive		Direct Examination and Culture Negative; or Laryngeal Swab Negative	
			No.	%	No.	%	No.	%	No.	%	No.	%
Section A	1	SH	111	99	36	32	6	5	33	30	36	32
		20 PH	89	100	26	29	9	10	30	34	24	27
		Groups 1 and 2 combined	104	100	21	20	4	4	26	25	53	51
	2	SH	91	100	22	24	6	7	24	26	39	43
		20 PH	106	100	10	9	4	4	23	22	69	65
		Groups 1 and 2 combined	89	99	11	12	1	1	18	20	59	66
Section B	3	SH	59	100	10	17	2	3	14	24	33	56
		20 PH	46	100	5	11	1	2	11	24	29	63
		Group 1	47	100	0	0	2	4	9	19	36	77
	3	SH	43	100	6	14	0	0	7	16	30	70
		20 PH	162	100	22	11	5	2	36	18	140	69
		Groups 1 and 2 combined	162	100	17	10	3	2	27	17	115	71

All patients were bacteriologically positive before treatment—that is, at least one pre-treatment specimen showed bacilli on direct examination or was positive on culture.

* Defined as follows: only a few clumps of acid-fast bacilli found after five minutes' search.

† Even if culture-negative.

TABLE IX.—Results of Isoniazid Sensitivity Tests in SH, S2H, 20 PH, and 10 PH Patients (Excluding Those Found to Have Organisms Resistant to any Drug on Entry to Trial)

	Months after Entry to Trial	Treatment	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but Sensitivity Result Not Available	Total Results Available (b)	Patients Culture-positive with Sensitivity Tests						Total Resistant		
							No Growth on 0.2 µg. per ml.	Growth on 0.2 µg. per ml. Not on 1	Growth on 1 µg. per ml. Not on 5	Growth on 5 µg. per ml. Not on 10	Growth on 10 µg. per ml. Not on 50	Growth on 50 µg. per ml.	No. (c)	(c) as % of (b)	(c) as % of (a)
Section A (Groups 1 and 2 combined, including subgroup 1A)	2	SH	104	48	3	53	44	8	1	0	0	0	1	2	1
		20 PH	91	43	3†	45	39	6	0	0	0	0	0	0	0
	3	SH	106	67	0	39	25	1	0	1	0	1	2	5	2
Section B (Groups 1, 2, and 3 combined, excluding subgroup 1A)	2	SH	71	37	2	32	26	6	0	0	0	0	0	0	0
		S2H	94	49	0	45	36	4	1	2	1	0	0	11	5
		20 PH	70	38	2	30	24	6	0	0	0	0	0	0	0
	3	SH	74	56	0	18	16	0	0	2†	0	0	2	11*	3
		S2H	94	71	2	21	9	4	1	1	0	3	8	38	9
		20 PH	67	48	1	18	14	4	0	0	0	0	0	0	0
		10 PH	65	49	0	16	13	2	0	0	0	1	1	6	2

* Percentages based upon fewer than 25 observations are enclosed in parentheses, as an indication of the small totals.

† One of these cultures showed growth at 5 µg. per ml., but was not tested at higher concentrations.

‡ See note at foot of page.

similar. It will be noted, however, that at three months the patients with the more acute disease (Group 1) had not fared so well as the Group 2 patients.

Section B of Table VIII presents a supplementary comparison of the effects of streptomycin plus isoniazid and P.A.S. plus isoniazid in all patients. Of 203 SH and S2H patients, specimens from 69% were negative at the end of three months, both on direct examination and on culture, compared with 71% from 162 20 PH and 10 PH patients.

3. Sensitivity Tests

The results of the sensitivity tests at two and three months, on all the SH and 20 PH patients in Groups 1 and 2 combined, appear in Section A of Tables IX–XI.

So far in this report no separate information on the S2H or 10 PH series has been presented, since the numbers of results are at present rather small. These two treatments were included in the trial because they are more readily administered to, and tolerated by, the patient than the SH and 20 PH treatments respectively. However, since a crucial measure of the suitability of these combinations is their ability to prevent the emergence of drug-resistant bacteria, the data on drug resistance, although limited, are sufficiently important to be presented now for each of the four treatments separately. To make valid comparisons between the SH and S2H series, the SH patients in subgroup 1A (who have no counterparts in the S2H series) have been omitted. Similarly, the 20 PH patients in subgroup 1A have been omitted from the comparison between the 20 PH and 10 PH series. The small numbers of Group 3 patients have been retained in the analysis. The results of these comparisons appear in Section B of Tables IX–XI.

Isoniazid Sensitivity.—The results of the isoniazid-sensitivity tests are set out in Table IX. At three months results were available for 39 positive cultures from 106 SH patients; 2 of the cultures yielded resistant strains. The corresponding figures for 89 20 PH patients were 29 positive cultures, none of which yielded resistant strains. The incidence of isoniazid resistance for a period of three months is thus low with each treatment.†

Turning to the comparison between the SH and S2H treatments, and between the 20 PH and 10 PH treatments (Section B of Table IX), it will be seen that at three months cultures were found to be resistant from 2 of 18 patients on SH compared with 8 of 21 on S2H and from 0 of 18 on 20 PH compared with 1 of 16 on 10 PH. The least satisfactory figures are those for the S2H treatment, for which the resistant cultures at three months represent 38% of all positive cultures, compared with 11% for the SH series; they represent 9% of all the patients for whom cultures

were undertaken, compared with 3% for the SH series. At two months also the results for the S2H series are inferior to those for the SH series, 5 of 45 positive cultures from S2H patients being resistant to isoniazid, compared with 0 of 32 cultures from SH patients. The findings in the 10 PH series at two and three months, on the other hand, are almost as satisfactory as in the 20 PH series, although the numbers are small.

Streptomycin Sensitivity.—At two months 1 of 52 cultures from 104 SH patients was resistant to streptomycin (Table X). At three months there was one resistant strain among 38 cultures from 106 patients. The SH combination is thus effective for at least three months in preventing the emergence of bacilli resistant to streptomycin.

The comparison of the SH and S2H treatments in Section B of Table X shows that 0 of 18 cultures from 74 SH patients, and 3 of 22 cultures from 94 S2H patients, were streptomycin-resistant at the end of three months.

P.A.S. Sensitivity.—At two months 2 of 47 cultures from 91 20 PH patients were resistant to P.A.S. (Table XI). At three months there was 1 resistant strain among 28 cultures from 89 patients. The 20 PH combination is thus effective for a three-month period in preventing the emergence of bacilli resistant to P.A.S.

The comparison of the 20 PH and 10 PH treatments in Section B of Table XI shows that 1 of 18 cultures from 67 20 PH patients, and 1 of 14 from 65 10 PH patients, were P.A.S.-resistant at the end of three months.

‡ Special reference must be made to the results of isoniazid-sensitivity tests at two months in 3 20 PH patients. All were from one small centre which had recently entered the trial, and they represent the total contribution of the centre to the two treatment series receiving P.A.S. plus isoniazid.

The cultures from two of these patients were reported at the local laboratory as resistant to two months to isoniazid, and were submitted as usual to the reference laboratory for confirmation of the level of resistance. In the reference laboratory, however, both cultures were found to be sensitive to isoniazid. The two cultures were subsequently retested both locally and centrally and the results in both laboratories were sensitive. The culture from the third patient was accidentally discarded at the local laboratory and a test at the reference laboratory gave a sensitive result. However, a culture at six weeks on the same patient had been reported as resistant to isoniazid at the local laboratory, but sensitive at the reference laboratory. At three months specimens from all 3 patients were negative on culture, so that no sensitivity tests were possible.

It must be realized that the check-tests were made on cultures which had been kept for some while before testing, and in one instance on a subculture; any isoniazid resistance may have diminished in the interval. On the other hand no isoniazid-resistant strains, either in 20 PH or in 10 PH patients, were reported at two months from any other centre. In these circumstances it was decided with the local bacteriologist that the results of these tests should be regarded as equivocal. They have been entered as "Culture-positive, sensitivity test not available."

TABLE X.—Results of Streptomycin Sensitivity Tests in SH and S2H Patients (Excluding Those Found to have Organisms Resistant to any Drug on Entry to Trial)

	Months after Entry to Trial	Treatment	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but Sensitivity Result not Available	Patients Culture-positive with Sensitivity Tests				Total Resistant		
						Total Results Available (b)	Sensitive	Moderately Resistant (Ratio 8 to 99)	Strongly Resistant (Ratio 100 or More)	No. (c)	(c) as % of (b)	(c) as % of (a)
Section A (Groups 1 and 2 combined, including subgroup 1A)	2	SH	104	48	4	52	51	1	0	1	2	1
	3	SH	106	67	1	38	37	1	0	1	3	1
Section B (Groups 1, 2, and 3 combined, excluding subgroup 1A)	2	SH S2H	71	37	2	32	31	1	0	1	3	1
	3	SH S2H	74	56	0	18	18	0	0	0	(0)*	0
			94	71	1	22	19	2	1	3	(14)	3

* Percentages based upon fewer than 25 observations are enclosed in parentheses, as an indication of the small totals.

TABLE XI.—Results of P.A.S. Sensitivity Tests in 20 PH and 10 PH Patients (Excluding Those Found to have Organisms Resistant to any Drug on Entry to Trial)

	Months after Entry to Trial	Treatment	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but Sensitivity Result not Available	Patients Culture-positive with Sensitivity Tests				Total Resistant		
						Total Results Available (b)	Sensitive	Moderately Resistant (Ratio 8 to 99)	Strongly Resistant (Ratio 100 or More)	No. (c)	(c) as % of (b)	(c) as % of (a)
Section A (Groups 1 and 2 combined, including subgroup 1A)	2	20 PH	91	43	1	47	45	2	0	2	4	2
	3	20 PH	89	59	2	28	27	0	1	1	4	1
Section B (Groups 1, 2, and 3 combined, excluding subgroup 1A)	2	20 PH 10 PH	70	38	0	32	30	2	0	2	6	3
	3	20 PH 10 PH	67	37	3	27	27	0	0	0	0	0
			65	48	1	18	17	0	1	1	(6)*	1
			65	49	2	14	13	1	0	1	(7)	2

* Percentages based upon fewer than 25 observations are enclosed in parentheses, as an indication of the small totals.

IV. DISCUSSION

In the first report of this trial (Medical Research Council, 1952) it was shown that isoniazid was an effective drug in the treatment of pulmonary tuberculosis, but that when it was used alone resistant bacteria emerged frequently and rapidly. This finding indicated the importance of combining isoniazid with other drugs active against tuberculosis, in order to find a treatment which was bacteriologically as well as clinically effective.

Accordingly, from September 5, 1952, four combined treatments have been investigated—namely, streptomycin 1 g. daily plus isoniazid (SH), streptomycin 1 g. twice a week plus isoniazid (S2H), P.A.S. (sodium salt) 20 g. daily plus isoniazid (20 PH), and P.A.S. (sodium salt) 10 g. daily plus isoniazid (10 PH). The dosage of isoniazid was 200 mg. daily in each treatment. Over 600 patients have now been given one of these four treatments, allocated concurrently and at random, and this report presents clinical and bacteriological results at three months on 391 of these patients who were admitted to the trial before March 31, 1953. For reasons given, the main comparison in the report is between the SH and 20 PH treatments, the results at the end of three months being summarized in Table XII. Over this limited period the two treatments were of comparable efficacy in improving the general clinical condition, in lowering the sedimentation rate, in resolving pyrexia, and in suppressing tubercle bacilli in the sputum. Patients on the SH treatment gained more weight and a rather higher proportion showed substantial radiographic improvement, but on present totals the differences are not statistically significant.

In the second report of the trial (Medical Research Council, 1953a) it was concluded that streptomycin 1 g. daily plus isoniazid 200 mg. daily was clinically the most effective anti-tuberculosis chemotherapy yet investigated in the trial, although its superiority to streptomycin 1 g.

TABLE XII.—Summary of Comparisons of Streptomycin 1 g. Daily Plus Isoniazid 200 mg. Daily With P.A.S. (Sodium 20 g. Daily Plus Isoniazid 200 mg. Daily at the End of Three Months' Treatment

	Streptomycin 1 g. Daily plus Isoniazid (%)	P.A.S. (Sodium) 20 g. Daily plus Isoniazid (%)
General condition:		
Improvement 2-plus	34	38
" 1-plus	54	51
No change	10	11
Deterioration	0	0
Death	1	1
Weight:		
Gain 14 lb. (6.4 kg.) or more	45	38
" 7-13 lb. (3.2-6.3 kg.)	31	29
" less than 7 lb., or no change	20	26
Loss	4	8
Temperature:		
Afebrile at 3 months (febrile at start)	79	85
Erythrocyte sedimentation rate:		
Fell to normal from 21 or more in 3 months	37	46
Radiograph:		
Improvement 2-plus or 3-plus	54	42
" 1-plus	28	34
No change	16	20
Deterioration	2	2
Sputum:		
At 3 months: Direct positive	13	13
Positive culture only	22	20
Negative	65	66
Isoniazid sensitivity (positive cultures):		
At 3 months: Sensitive	92	86
Doubtful	3	14
Resistant	5	0

See Tables III-IX for the numbers of patients on which these percentages are based. See Tables X and XI for the results of the streptomycin-P.A.S. sensitivity tests.

daily plus P.A.S. (sodium) 20 g. daily was not great. T new information now presented on the clinical efficacy of P.A.S. (sodium) 20 g. daily plus isoniazid indicates that this combination is a powerful addition to acceptable drug treatments of pulmonary tuberculosis over a three-month period. Further evidence of

efficacy of combining P.A.S. with isoniazid is provided by the supplementary analysis of the progress of the 20 PH and 10 PH patients combined, which presents results for a much larger number of patients.

It was also shown in the second report that the combination streptomycin 1 g. daily plus isoniazid effectively hindered the emergence of bacilli resistant either to isoniazid or to streptomycin; the present report confirms these findings on a further series of patients, who were on the whole suffering from more acute forms of the disease. At three months 39 cultures from 106 patients were isolated and tested for isoniazid sensitivity, and 2 were resistant; 1 of 38 cultures from the same number of patients was resistant to streptomycin. The combination P.A.S. (sodium) 20 g. daily plus isoniazid is no less effective in preventing the emergence of strains resistant either to isoniazid or to P.A.S. At three months 29 cultures from 89 patients were tested for isoniazid sensitivity, and all were sensitive; 1 of 28 cultures from the same number of patients was resistant to P.A.S. For a three-month period the 20 PH treatment is thus bacteriologically as well as clinically effective. As an indication of the ability of the 20 PH combination to prevent the emergence of isoniazid-resistant strains, it will be recalled that in an earlier stage of the trial 64% of 132 positive cultures from 243 patients on isoniazid alone were resistant at three months (Medical Research Council, 1953c).

Before a valid comparison of the relative efficacy of the four treatments SH, S2H, 20 PH, and 10 PH could be made, it was necessary to exclude the patients in subgroup 1A, who were allocated only to the SH and 20 PH treatments. When this was done, no marked differences in clinical response were apparent between patients on each of the four treatments, but a full clinical evaluation must await the results for the larger number of patients now under study. However, the bacteriological information already available, although based upon small numbers, is of sufficient importance to warrant discussion.

The results of sensitivity tests for the 20 PH and the 10 PH patients at three months showed practically no

development of bacterial resistance, either to isoniazid (see Chart) or to P.A.S., in patients on either of these treatments. The finding that 10 PH appears to be bacteriologically an effective treatment should lend particular interest to the detailed study, in due course, of the clinical findings in 10 PH patients.

The preliminary comparison of the results of sensitivity tests for the SH and S2H patients at three months indicates a less satisfactory situation for the latter treatment. Although the development of streptomycin resistance was largely prevented by each combination, the incidence of isoniazid-resistant strains at three months (see Chart) was noticeably greater for the S2H than for the SH patients. If, on larger numbers, this difference is confirmed, it will represent a definite disadvantage of the combination streptomycin 1 g. twice a week plus isoniazid.

In conclusion, this analysis has demonstrated that P.A.S. (sodium) 20 g. daily plus isoniazid 200 mg. daily, when used for a three-month period, is very effective, both clinically and bacteriologically, in the treatment of pulmonary tuberculosis. It ranks with the most efficacious chemotherapeutic combinations so far tested in this trial—namely, streptomycin 1 g. daily plus isoniazid 200 mg. daily and streptomycin 1 g. daily plus P.A.S. (sodium) 20 g. daily. It possesses an advantage over these two established treatments in that both drugs are administered by mouth.

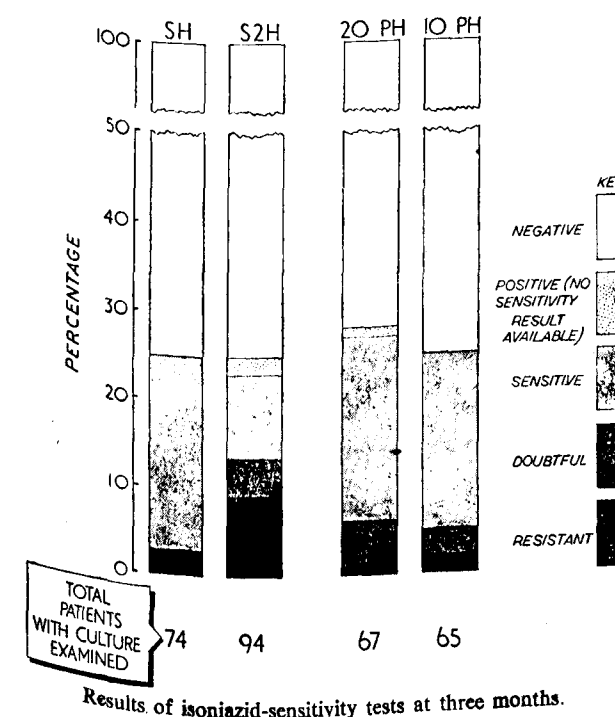
V. SUMMARY

As part of a clinical trial of isoniazid (isonicotinic acid hydrazide) in the treatment of pulmonary tuberculosis, 391 patients were studied in 50 hospitals: 119 were treated with streptomycin (1 g. daily) plus isoniazid (100 mg. twice a day), 100 with streptomycin (1 g. twice a week) plus isoniazid (100 mg. twice a day), 101 with P.A.S. (sodium salt, 5 g. four times a day) plus isoniazid (100 mg. twice a day), and 71 with P.A.S. (sodium salt, 5 g. twice a day) plus isoniazid (100 mg. twice a day). When submitting a case the physician did not know which treatment the patient would receive, this being determined by random allocation. The present report analyses results at the end of three months' treatment.

Three main groups were observed: Group 1, acute rapidly progressive disease of recent origin; Group 2, other forms considered suitable for chemotherapy; Group 3, chronic disease considered unlikely to respond to chemotherapy.

For reasons given, the principal comparison in the report is between the patients in Groups 1 and 2 on streptomycin 1 g. daily plus isoniazid 200 mg. daily (SH) and those on P.A.S. (sodium) 20 g. daily plus isoniazid 200 mg. daily (20 PH). (A full comparison of all four treatments will be made when results for more patients are available.)

On admission, these two treatment series had a similar distribution of patients with severe and less severe illness. At the end of three months the general condition had improved in 89% of the SH patients and 88% of the 20 PH patients. The average gain in weight during the period was 12.8 lb. (5.8 kg.) for the SH patients and 10.8 lb. (4.9 kg.) for the 20 PH patients. The temperature fell to normal in 79% of febrile SH patients and 85% of febrile 20 PH patients. In patients with an E.S.R. of 21 or more before treatment the rate fell to 10 or less in 37% of those on SH, compared with



Results of isoniazid-sensitivity tests at three months.

46% of those on 20 PH. Changes in radiographic appearances were independently assessed by a radiologist unaware of the treatment of any patient. Two-plus or three-plus improvement was seen in 54% of SH and 42% of 20 PH patients. There were two radiographic deteriorations and one death on each treatment. None of the above differences is statistically significant.

The proportion of patients bacteriologically negative, both on direct examination and on culture, at a single examination at three months was 65% for the SH series and 66% for the 20 PH series.

Bacillary resistance to isoniazid was found in 2 of 39 culture-positive SH patients tested at three months, compared with 0 of 29 similar 20 PH patients. Bacillary resistance to streptomycin was found in 1 of 38 culture-positive SH patients, and to P.A.S. in 1 of 28 similar 20 PH patients.

It is concluded, *judging solely from the results at three months*, that P.A.S. (sodium) 20 g. daily plus isoniazid 200 mg. daily is a very effective combination of drugs, both clinically and bacteriologically; it ranks with the most efficacious treatments so far studied—namely, streptomycin 1 g. daily plus isoniazid 200 mg. daily and streptomycin 1 g. daily plus P.A.S. (sodium) 20 g. daily.

A supplementary clinical comparison of all the 219 patients on streptomycin plus isoniazid and all the 172 on P.A.S. plus isoniazid confirms the clinical efficacy of combining P.A.S. with isoniazid. However, patients on streptomycin plus isoniazid gained a little more weight, and a higher proportion showed substantial radiographic improvement.

A preliminary analysis of results of sensitivity tests on each of the four treatments shows that P.A.S. (sodium) 10 g. daily plus isoniazid 200 mg. daily may prove to be a bacteriologically effective combination for at least three months. On the other hand, treatment with streptomycin 1 g. twice a week plus isoniazid 200 mg. daily is apparently less effective than streptomycin 1 g. daily plus isoniazid 200 mg. daily in preventing the development of bacterial resistance to isoniazid over a three-month period.

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DESENSITIZATION TO STREPTOMYCIN AND P.A.S.

BY

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It is not proposed to discuss in detail in this paper the symptoms of hypersensitivity to streptomycin or P.A.S. (para-aminosalicylic acid), but only to emphasize that desensitization is possible. In patients sensitized by treatment with streptomycin or P.A.S. desensitization is usually easy, and has been referred to briefly elsewhere (Crofton, 1953). It is much more difficult to desensitize individuals sensitized to streptomycin by handling it in the course of their work, and I have seen no previous report of this being successfully accomplished.

Desensitization of Streptomycin-handlers

The recent statement from the Ministry of Health (1953) indicates that a number of people whose duty involves the handling of streptomycin become sensitized to the drug. In many cases the degree of sensitivity is very high; a nurse may not only be unable to administer streptomycin injections but may be unable to work in a ward where they are given or enter a room where the injections are prepared. The previous literature on this subject has been well reviewed in the Ministry of Health report and will not be recapitulated here. The present report is only to emphasize that even individuals highly sensitive to streptomycin can be desensitized, and to describe two cases in which this has been done.

Case 1

A ward sister aged 37 had no family or personal history of allergy. Two years before admission to hospital she had begun giving streptomycin injections, and during the five

months before the onset of symptoms one year previously she had been giving injections daily to between two and nine patients. She had not worn rubber gloves. One year before admission she began to notice swelling of the periorbital tissue of the right eye, which reached its maximum two hours after giving streptomycin injections. (She had previously lost her left eye in an accident.) These symptoms gradually increased, and eight months before admission a patch test with streptomycin was done on her back. This resulted in severe local reaction and also local redness and swelling around her right eye. By this time she had become so sensitive that she was liable to develop the reaction whenever she went into the ward, and she had to be put off work. Even then she found that a flare occurred in the eye if she went to visit one of her friends who was changing after coming off duty.

At the time of admission she had not been in contact with streptomycin for some time, and there were no abnormal physical signs. An intradermal test with 50 µg. of streptomycin in 0.1 ml. produced a local reaction with oedema 4 by 4 mm. in diameter and an erythema 20 by 18 mm. at six hours. One hour after the injection there was a reaction in the eye, with reddening and itching of the right cheek. She was placed on diphenhydramine hydrochloride, 50 mg. three times a day, and then two injections of distilled water were given, without reaction, on successive days. Thereafter she had a first injection of 10 µg. of streptomycin. The next day she said she felt slightly unwell, but there was no local reaction. It was thought that this feeling might be due to overdosage with diphenhydramine, and this was reduced to 50 mg. twice a day. On the following two days intramuscular injections of 20 and 50 µg. successively of streptomycin were given without incident. On the 4th day 100 µg. was given, but 16 hours later she developed redness and oedema of the right eyelids. This lasted for two days. No streptomycin was given until the evening of the second day, and diphenhydramine was increased to three times a day.

On the 6th day after starting treatment the dosage of streptomycin was reduced to 50 µg. On the 7th and 8th days no injections were given as there was still slight desquamation of the right eye but no oedema. On the 9th day 100 µg. was given again with no reaction. On the 10th day 200 µg. produced oedema and redness of the upper eyelid six hours later. On the following day this dose was repeated with an extra dose of diphenhydramine and there was no reaction. On the 12th day the dose was stepped up to 300 µg. and produced no reaction. On the 13th day, following 500 µg., there was marked swelling and oedema of the right eyelids, and 2½ hours after the injection she was hardly able to open the eye. At the same time the patch test on her back which had been done eight months previously became red and hot. On the 14th day this reaction had subsided and the 500-µg. dose was repeated. The reaction in the back and eye occurred again, but less severely than previously, and on the evening of the 15th day the 500-µg. dose was repeated with no reaction. With the succeeding doses of 600, 800, 1,000, and 1,250 µg. there was no reaction, but with 2-, 3-, and 4-mg. doses there was very slight swelling and itching of the eyelids.

On the 23rd day 6 mg. produced no reaction, but there was a slight one with the 10-mg. dose the next day. This had subsided by the evening of the 25th day and 12 mg. was given. Thereafter 20, 30, 50, and 100 mg. were given without incident, but 0.2 g. on the 30th day was followed by redness and itching. There was no reaction to 0.3 g. on the 31st day, but there was a slight reaction to 0.5 g. on the 32nd. Thereafter 0.7 g. and 1 g. were given without any reaction. Diphenhydramine was then stopped. For a couple of days she complained of headache and nausea, but this was relieved by giving 50 mg. of diphenhydramine on the third day. The next day there was some recurrence, which was relieved by giving glucose in a diphenhydramine capsule. Thereafter there was no further trouble. A further injection of 1 g. was given after the cessation of diphenhydramine treatment, and there was no reaction.

The intradermal test with 50 µg. of streptomycin was then repeated and there was no reaction whatsoever. Gauze soaked in 50% streptomycin solution was strapped on her back for 24 hours with no reaction. She was therefore regarded as having been desensitized, and returned to work in tuberculosis wards. Three years later she has had no recurrence of trouble. She has on the whole avoided giving streptomycin injections herself, but has occasionally done so, taking the precautions we have previously outlined (Crofton and Foreman, 1948).

Summary of Case 1.—A nursing sister aged 37 became sensitized to streptomycin after giving injections for about a year. The sensitivity consisted of redness and swelling around the right eye, and was so severe that she was unable to enter a room in which one of her colleagues was changing after coming off duty. Skin tests confirmed the streptomycin sensitivity and desensitization was carried out by giving ascending daily intramuscular injections of streptomycin over 35 days, the first injection being 10 µg. and the last 1 g. Minor reactions occurred during the course of desensitization. She has subsequently worked for three years in tuberculosis wards without incident. This patient was a sensible woman and could probably have been desensitized as an out-patient, but she was admitted to hospital, partly because I had not carried out such desensitization previously and partly because the sanatorium in which she worked was situated a long way away.

Case 2

An assistant nurse aged 47 had no personal or family history of allergic conditions. In February, 1948, she had begun giving streptomycin injections, up to about 28 a day. Rubber gloves were available but were seldom worn. In November, 1948, she began to develop conjunctivitis and periorbital swelling. In January, 1949, a streptomycin patch test was said to have been positive. Subsequently she did not handle streptomycin herself, but continued to work in the tuberculosis wards. In May, 1949, the condition recurred and by September she had also developed a dermatitis of the arms and hands. Thereafter she ceased work in the wards and during this time had almost no trouble. In January, 1952, she had a recurrence on the eyes and on the arms. Just before the onset of this she had passed through a room where streptomycin injections were being prepared. An intradermal injection of 25 µg. of streptomycin resulted in an erythema 9 by 10 mm. at 24 hours, almost no reaction being present at six hours. The patient had a difficult personality. It did not prove possible to desensitize her as an out-patient and she was consequently admitted to hospital.

Mepyramine maleate, 100 mg. three times a day, was given and desensitization was begun with an intramuscular dosage of 50 µg. Daily doses of 75, 100, 200, and 400 µg. were given without incident. When given 500 µg. and subsequent doses of 800 and 1,600 µg. the rash became a little worse, with slight itching on the forehead. The 1,600-µg. dose was therefore repeated for five days, until the reaction subsided. On the 14th day 2 mg. was given. There was again some reaction, so 1.6 mg. was given on the 15th day and no injections on the 16th or 17th. Owing to the persistence of reactions three further injections of 2 mg. were given between the 18th and 20th days, 2.5 mg. on the 21st, 3 mg. on the 22nd, and 3.5 mg. on the 23rd and 24th. On the 25th to the 29th days no injections were given, because of persistent dermatitis. Then 3.5 mg. was again given.

Subsequently the dose was raised slowly with occasional intermissions of a day or two days and on several occasions repetition of doses. The doses (in mg.) on successive days were 4, 4, 4, 4.5, nil, 5, 5.5, nil, 5.5, 6, 6.5, 7, 7.5, nil, nil, 7.5, 8, 8.5, 9, nil, nil, 9, 9.5, 10, 12, 14, 16, nil, 18. At this stage there was again a slightly more severe reaction, exaggerated by her difficult personality, and no injections were given for three days. The reaction subsided and injections were resumed: 18, 19, 20, 22, 24, 25, 27, 30, 32, 34, 38, 43, 50, 70, 75, 85, 100, 120, 120, 150, 180, nil, nil, 180,

nil, 200, nil, 220, 240, 260, 280, 300, 330, 360, 380, 400, 420, 450, 500 mg. At this point an error was discovered, most unfortunate but of some interest. It was found that, by mistake, desensitization had been carried out with dihydrostreptomycin sulphate instead of with streptomycin sulphate. Streptomycin sulphate was substituted and, foolishly, the same dose as the previous dose of dihydrostreptomycin was given—that is, 500 mg. There was a very severe reaction. Although the temperature rose only to 98.8° F. (37.1° C.), there was a brisk generalized rash, erythema, slight oedema of the eyes, and great exacerbation of the peripheral dermatitis. Injections were stopped for five days until the reaction had subsided and everyone had calmed down.

Desensitization was then recommenced with streptomycin sulphate, starting with 50 µg. It was found possible to increase the dose quite rapidly, indicating that the dihydrostreptomycin had at least partially desensitized the patient to streptomycin. The dose was increased from 50 µg. to 5 mg. within nine days. There was a slight reaction at this stage, and subsequent doses of 5, 8, 10, 15, and 25 mg. were given without reaction. A dose of 45 mg. resulted in a slight reaction lasting three days, but the dose was increased from 45 to 140 mg. within the succeeding week. At 140 mg. a small patch of dermatitis appeared on the chin and no injections were given for four days. Over the next 25 days the doses were increased from 150 mg. to 1 g. with no significant incidents. Mepyramine maleate was then stopped and intradermal tests were repeated with 100 µg. of streptomycin. There was no reaction. A piece of gauze soaked in 50% streptomycin was then applied to the back for 24 hours without any reaction. Desensitization had therefore apparently been accomplished. Unfortunately, in spite of this, the patient refused to return to work in the wards, and it has not been possible to test out in practice the success of the desensitization.

Summary of Case 2.—An assistant nurse aged 47, who had developed a streptomycin dermatitis and who was highly sensitive to the drug, was desensitized to dihydrostreptomycin by being given daily intramuscular injections, rising from 50 µg. to 0.5 g. over fifteen weeks. At this stage streptomycin was substituted, resulting in very severe reaction. Desensitization was recommenced with streptomycin over the succeeding eight weeks, in which the intramuscular dose was increased gradually from 50 µg. to 1 g. Intradermal and patch tests of streptomycin were negative at the end of the desensitization period, but the patient refused to return to work in tuberculosis wards.

Comment

It seems clear, therefore, that desensitization in individuals whose skin has become sensitized to streptomycin by contact is quite feasible, although it may take several months and minor reactions may occur. It is probable that the patient's mentality may have something to do with the speed with which desensitization is attained. In the first case the patient was a sensible woman and, in spite of some minor reactions, desensitization was readily achieved in a period of 35 days, excluding the time utilized in doing tests. The second patient had a difficult personality and tended to exaggerate her reactions. In consequence, even allowing for the error over dihydrostreptomycin, desensitization took much longer. It was apparent that there was some cross-desensitization to dihydrostreptomycin and that the initial use of that substance for desensitization had resulted in partial desensitization to streptomycin, for subsequent desensitization to streptomycin itself took only eight weeks. It is felt that, with a sensible individual, it should be quite feasible to carry out desensitization on an out-patient basis. This in fact has been done elsewhere, using methods similar to those described (personal communication, Dr. Michael Gibson).

Desensitization of Patients

In patients undergoing treatment with streptomycin and P.A.S. hypersensitivity reactions are well known. The com-

monest manifestation is fever, usually occurring 10 to 25 days after starting treatment. Any fever at this stage of treatment should be regarded as a hypersensitivity reaction until proved otherwise. Rashes may be seen, with or without fever. When such a reaction occurs chemotherapy should be stopped. Continuation in spite of a warning fever has resulted in severe liver damage, encephalitis, or other serious hypersensitivity reactions, especially in the case of P.A.S. When the reaction has subsided one may test for hypersensitivity by giving 0.5 g. of streptomycin. If the patient is hypersensitive symptoms such as mild fever, a rash, or itching of the skin occur within an hour or two. If there is no reaction a dose of 1 g. is given in order to make certain. When the reaction, if any, has subsided, a half-dose of P.A.S. (usually 2.5 g.) is given, for the patient may be sensitive to both drugs. Again a reaction will usually occur within an hour or two. If there is none a full dose (5 g.) is repeated two or three times to make certain.

Desensitization is then begun. If the patient is sensitive to both drugs it is well to desensitize to P.A.S. first, as resistance to this drug develops less readily; after desensitization normal doses of P.A.S. can then be used to cover the desensitization to streptomycin. It is usually adequate to start with 0.5 g. of P.A.S., working up to the full dose by daily increments over 10 to 14 days. With streptomycin an initial dose of 0.1 g. is usually low enough, and this can be increased to 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, and 1 g. in the succeeding days, desensitizing over 10 to 14 days. In both cases, if there is any reaction the last dose is repeated after the reaction has subsided.

Personally I have encountered no difficulties in a large number of patients desensitized; it is a very much easier matter than the desensitization of streptomycin-handlers. The following patient is an example. She was sensitive to both drugs and was a little more difficult than usual to desensitize, but presented no major problems.

Case 3

A female schoolteacher aged 23 was admitted with pulmonary tuberculosis of recent origin. She was started on streptomycin, 1 g., and P.A.S., 15 g. daily, the latter being increased to 17 g. within a few days. She had a slight fever up to 99° F. (37.2° C.) or a little above. On the 22nd day the temperature rose to 100.6° F. (38.1° C.) in the evening; it was normal the next morning, but rose to 104° F. (40° C.) that evening, with a bright red morbilliform rash over the body. P.A.S. was stopped and the next day the temperature subsided. That evening she received the normal dose of streptomycin and the temperature again rose to 104° F. (40° C.), with rigors, exacerbation of the rash, and Raynaud's phenomenon in the fingers. Streptomycin was then stopped also and an antihistamine drug given. The temperature was normal next day and the rash cleared within two days. A test dose of 2.5 g. of P.A.S. resulted in a faint rash and itching of the skin one hour later. Two days later a test dose of 0.5 g. of streptomycin resulted in pains in the arms and flushing of the face and conjunctivae. Both these reactions subsided within 12 hours.

Desensitization to P.A.S. was begun with 0.5 g. the first day in a single dose, 0.5 g. four times on the 2nd day, 0.5 g. five times on the 3rd day, 1 g. four times on the 4th day (slight itching of skin). On successive days the following doses were then given, each five times a day: 1.5, 2, 2.5 and 3 g. On the last-mentioned dose there was slight prickling of face and legs lasting one to two hours after each dose, but the dose was maintained and within ten days could be raised to 17.5 g. a day. Desensitization to streptomycin was then begun with 0.1 g. on the first day. Slight prickling of the legs occurred with this dose and with the 0.2-g. dose the next day. The latter was repeated, as was the 0.4-g. dose a few days later, but the full 1-g. dose was reached on the 12th day. P.A.S. was continued throughout the desensitization to streptomycin. Thereafter there was

no further trouble. Chemotherapy was continued for over a year, during which she had a segmental resection of the residual disease.

Summary of Case 3.—A female patient aged 23 developed a high temperature and a morbilliform rash after 22 days on streptomycin and P.A.S. Test doses proved she had become sensitive to both drugs. The daily dose of P.A.S. was gradually increased from 0.5 g. to 15 g. over 11 days; 10 days later it was raised to 17.5 g. Streptomycin doses were increased from 0.1 to 1 g. daily over 12 days. Subsequently she continued both drugs for over a year without incident.

Summary

Desensitization of streptomycin-handlers who have become hypersensitive to the drug is difficult but quite feasible. Two cases are reported.

By contrast, patients who acquire hypersensitivity to streptomycin or P.A.S. during treatment are usually readily desensitized. As an example a case is described of a patient hypersensitive to both drugs.

My thanks are due to the residents and nursing staff at Hammersmith Hospital, London, the Northern General Hospital, and Southfield Hospital, Edinburgh, who carried out the day-to-day treatment of these patients.

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EFFECT OF HEXAMETHONIUM BROMIDE ON THE CEREBRAL CIRCULATION IN HYPERTENSION

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The fall in total peripheral resistance which occurs after the administration of the ganglion-blocking agent hexamethonium bromide is not distributed equally between the vascular areas of the body; there follows, therefore, a redistribution of peripheral blood flow. Thus the flow to the foot and toes is greatly increased, while that to the calf segment of the leg muscles is diminished; vascular resistance in the liver decreases enough to maintain the blood flow at its previous level (Freis *et al.*, 1952). The more complex changes in the kidneys have been described by these and other authors (Kirkendall and Culbertson, 1952; Mackinnon, 1952; Miles *et al.*, 1952; Moyer *et al.*, 1952). The effects upon the cerebral and coronary circulations are of particular importance, considering how serious might be the risk of impairment of the blood supply to heart or brain in hypertensive patients. Crumpton and Murphy (1952) have shown that in dogs with experimental renal hypertension the vascular resistance in the coronary system is slightly re-

duced by hexamethonium and that the mean coronary blood flow is maintained. These authors have further outlined the results of their studies of the cerebral circulation in six patients with hypertension and grade III to IV retinopathy before and after blood-pressure reduction with hexamethonium bromide. The present investigation covers the same field in a series of hypertensive patients, in all of whom the changes in the fundi were classified as grade II (Keith-Wagener-Barker) with the exception of one case of malignant hypertension and grade IV retinopathy (Patient 2).

Methods

The studies were carried out on six patients with arterial hypertension who had been admitted to hospital for treatment with subcutaneous hexamethonium bromide. The nitrous oxide technique of Kety and Schmidt (1945, 1948) as modified by Scheinberg and Stead (1949) was employed, constant-rate samples over the ten-minute periods being withdrawn by means of an electrical device (Dewar *et al.*, 1953). In three cases cerebral venous blood was sampled through a needle introduced direct into the superior jugular bulb (Myerson *et al.*, 1927; Gibbs *et al.*, 1945); in the remainder cerebral venous blood was obtained through a cardiac catheter inserted into the left antecubital vein, the technique of which has been described elsewhere (Dewar *et al.*, 1953). Mean cerebral blood flow (C.B.F.) was calculated according to the formula:

$$C.B.F. = \frac{CV_{10} \times S \times 10}{\int_0^{10} (A-V) dt}$$

C.B.F. in ml. per 100 g. brain per minute =

where CV_{10} is the concentration of nitrous oxide in the cerebral venous blood in volumes % at the end of the ten-minute period, S is the partition coefficient of nitrous oxide between brain tissue and blood (known to be unity), and $\int_0^{10} (A-V) dt$ is the integral of the arterial-cerebral venous nitrous oxide difference for the period as determined from the difference between the nitrous oxide concentrations of the integrated arterial and cerebral venous samples.

Blood-pressure readings were made by the auscultatory method in the arm held at heart level, and the mean arterial blood pressure (M.A.B.P.) for each ten-minute period was calculated by adding one-third of the average pulse pressure to the average diastolic reading. The cerebral vascular resistance (C.V.R.) was taken as the quotient of M.A.B.P. divided by the mean C.B.F. In four cases analyses for oxygen content were made on the integrated arterial and cerebral venous samples and the cerebral oxygen consumption ($CMRO_2$) calculated by dividing the product of the mean arterio-venous oxygen difference ($A-VO_2$) and mean C.B.F. by 100. The gas analyses were made in a Van Slyke-Neill manometric apparatus, and were all performed by one of us (A. R. J.). Two estimations of blood flow were made on each patient, separated by at least 25 minutes. The conditions of the second were identical with those of the first except for the prior administration of hexamethonium bromide by intravenous or subcutaneous injection in a dose sufficient to cause significant blood-pressure reduction. The second estimation was not begun until the blood pressure had stabilized at its new level. The results of the studies are shown in the Table.

Hexamethonium bromide produced an average fall in the M.A.B.P. of 30% ($t = 4.7$, $P < 0.01$). This was accompanied by a 28% decrease in the C.V.R. ($t = 3.7$, $P < 0.05$), which in four instances fell to a value within the normal range (Kety and Schmidt, 1948). No significant change occurred in the mean C.B.F. during the period of blood-pressure reduction, successive estimations showing close agreement. (In each pair this was in fact within the range of twice the theoretical standard error of the method as performed by us—Dewar *et al.*, 1953.) In the four cases in which this was estimated, no essential alteration occurred in the $A-VO_2$ difference, nor in the rate of $CMRO_2$. These results agree with those obtained by Crumpton and Murphy

Effect of Hexamethonium Bromide on the Cerebral Circulation in Hypertension

Patient	Sex	Age	Fundi	Cerebral Venous Sampling Technique	Hexamethonium Bromide	M.A.B.P.		C.B.F.		C.V.R.		A-VO ₂		CMRO ₂	
						C	E	C	E	C	E	C	E	C	E
1	..	62	Grade II	Percutaneous	48 mg. i.v.	168	103	37	38	4.5	2.7	—	—	—	—
2	..	32	.. IV	..	..	160	127	60	57	2.7	2.2	—	—	—	—
3	..	45	.. II	..	.. subcut.	137	91	48	46	2.8	2.0	6.7	7.1	3.2	3.3
4	..	56	.. II	Cardiac catheter	..	191	109	55	51	3.5	2.2	7.6	7.5	4.2	3.8
5	..	49	.. II	..	..	127	111	38	38	3.3	3.0	9.6	9.2	3.7	3.4
6	..	57	.. II	..	..	132	100	59	58	2.2	1.7	4.8	5.7	2.9	3.3
Mean age		51		Mean values		153	107	50	48	3.2	2.3	7.2	7.4	3.5	3.5

C = Control observations.

E = Observations following the administration of hexamethonium bromide.

M.A.B.P. = Mean arterial blood pressure (mm. of mercury) over ten-minute period.

C.B.F. = Mean cerebral blood flow (ml. blood per 100 g. brain per minute) over ten-minute period.

C.V.R. = Mean cerebral vascular resistance (mm. mercury per ml. blood per 100 g. brain per minute) over ten-minute period.

A-VO₂ = Mean arterial-cerebral venous oxygen difference (ml. O₂ per 100 ml. blood) over ten-minute period.CMRO₂ = Mean cerebral oxygen consumption (ml. O₂ per 100 g. brain per minute) over ten-minute period.

(1952) in their group of six hypertensive patients with grade III to IV retinopathy; they found no significant alteration in the C.B.F., A-VO₂, and CMRO₂ values after reduction of the M.A.B.P. and C.V.R. with hexamethonium by 29% and 30% respectively.

It seems unlikely that hexamethonium lowers the abnormal cerebral vascular tone in hypertension by blocking sympathetic impulses to the cerebral vessels, since it has been shown that, while unilateral and bilateral procaine injections of the stellate ganglion produce no alteration in C.V.R. in hypertensive conditions (Harmel *et al.*, 1949; Scheinberg, 1950), such relaxation follows various procedures which result in decrease in the systemic arterial pressure—namely, the administration of dihydroergocornine, thoraco-lumbar sympathectomy, and differential spinal sympathetic block (Hafkenschiel *et al.*, 1950; Shenkin *et al.*, 1950; Kety *et al.*, 1950). The nature of the mechanism by which increased cerebral vascular resistance is maintained in hypertensive states, and by which it falls when the arterial pressure head is reduced, is not fully understood, but it appears to be a homeostatic response on the part of the cerebral circulation, which tends to maintain the cerebral blood flow and metabolism within normal limits.

These findings imply that cerebral nutrition and metabolism will not ordinarily be impaired by the treatment of hypertensive patients with hexamethonium bromide, since cerebral vascular relaxation to a degree sufficient to maintain adequate cerebral blood flow and oxygen consumption accompanies blood-pressure reduction of the order obtained above. Whether this mechanism is able to compensate for the more drastic and sudden hypotension which may sometimes follow the administration of this drug in sensitive patients is less certain, since it has been shown that the acute hypotension consequent upon differential spinal sympathetic block diminishes mean C.B.F. values (Kety *et al.*, 1950). Further, the possibility of an increased likelihood of cerebral thrombosis in patients in whom arterial disease favours the occurrence of such a complication cannot be considered to be eliminated by the present findings; a decrease in C.V.R., assuming blood viscosity and intracranial tension to remain constant, implies increased vessel calibre and increased blood volume per unit weight of tissue. This, if the mean C.B.F. does not alter, will cause slowing of the linear flow rate and prolongation of the local circulation time. It remains possible that such a result would contribute to the development of intravascular thrombosis.

Summary

The cerebral blood flow has been estimated by a modification of the nitrous oxide method in six patients suffering from arterial hypertension before and after administration of hexamethonium bromide. The mean arterial blood pressure fell by an average of 30%, but no significant change occurred in mean cerebral blood flow. The rate of cerebral oxygen utilization was

measured in four of these patients and showed no essential alteration. The practical implications of these findings is briefly discussed.

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The Royal Medico-Psychological Association's journal, the *Journal of Mental Science*, celebrates its centenary this month. It was in 1852 that the Association of Medical Officers of Asylums and Hospitals for the Insane decided at a meeting held in Oxford to establish a special asylum journal; and in November, 1853, the first issue of the *Asylum Journal*, as the *Journal of Mental Science* was then called, was published. Its aim was to "afford a medium of intercommunication between men engaged in the construction and management of asylums, in the treatment of the insane, and in all subsidiary operations. . . . It will be a record of improvements and experiments in psychotherapeutics." An editorial article in this issue was devoted to "The Headress of Pauper Lunatic Men." A stone-coloured fustian forage cap was recommended as peculiarly well suited for the use of the insane—"Its weight is 4½ oz., its cost, home made, 7d." (only a penny more than the *Asylum Journal*). It was admitted that the cap's appearance became "perhaps a little odd" when the fustian washed out white. "By no means an ill-looking cap," however, it was strongly advocated for epileptics subject to frequent and heavy falls. This was a modification of the old-fashioned epileptic ring, which "certainly had a somewhat uncouth appearance and suggested . . . the belt of Saturn or the halo of Saint," and was a chamois leather ring, stuffed with curled horsehair, somewhat in the shape of a narrow quoit and covered with grey serge—evidently an early type of crash helmet.

DETECTION OF ACHLORHYDRIA
WITHOUT INTUBATION

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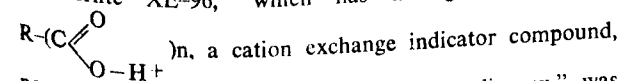
Intubation of the stomach to obtain samples of gastric juice for examination has two major disadvantages. Even with expert assistance it often proves distressing to the patient, and the act of swallowing the tube tends to alter the composition of the juice. Thus, nausea and retching inhibit the secretion of gastric hydrochloric acid in dogs even when histamine is injected every ten minutes (Grossman *et al.*, 1945), and the presence in the stomach of excessive saliva reduces the acid content (Zaus and Fosdick, 1934).

The most important information which the clinician wants from a gastric analysis is the ability or otherwise of the stomach to secrete hydrochloric acid. This can now be obtained by a simple test which does not involve the passage of a tube. This paper describes the origin of the test, its use by other workers, and some personal results.

Rationale and Development of Test

Following the work of Adams and Holmes (1935) on synthetic ion-exchange resins, H. L. Segal, of Rochester, New York, became interested in their use as antacids (Segal *et al.*, 1945). The therapeutic trials were disappointing, but in 1948 he and his co-workers began to develop the idea that an ion-exchange resin to which a special indicator cation was attached could be used to detect gastric hydrochloric acid without intubation.

The preparation and use of such a compound was first reported by Segal *et al.* (1950a). Starting with the resin "amberlite XE-96," which has the general formula



now marketed under the trade name of "diagnex," was produced by replacing the hydrogen ions of the carboxylic acid groups with quininium ions. Studies *in vitro* showed that the displacement of the quininium cations of this compound by cations in solution depended on various factors, the most important being the hydrogen-ion concentration. Sodium, potassium, and calcium replaced quinine only slightly, but magnesium was more powerful in this respect. When the compound was given orally to patients the hope that quinine would be easily liberated by the hydrogen ions of the hydrochloric acid present in gastric juice was confirmed. The quinine set free was rapidly absorbed and approximately a third excreted in the urine (Goodman and Gilman, 1941). The time of appearance, as well as the amount of quinine in the urine, was noted to avoid misinterpretation resulting from later ionic exchange in the small intestine.

In their preliminary clinical study Segal *et al.* (1950a) gave the quininium indicator compound orally in 2-g. doses with 50 ml. of 7% alcohol to 63 patients whose gastric secretory response to alcohol had been determined by the usual intubation technique on a previous day. In 34 of the 38 patients with free gastric hydrochloric acid quinine was found, on qualitative testing, in the urine excreted during

the first, second, and third hours after the administration of the compound, whereas none of the 25 with achlorhydria showed quinine in the first-hour urine and 20 also failed to excrete it in the second. They concluded that the appearance of quinine in the urine during the first and second hours indicated the presence of free gastric hydrochloric acid, and delay in its excretion until the third hour was compatible with achlorhydria. A few patients passed quinine only in the second and third hours and not in the first; quantitative testing by a photofluorimetric technique was then necessary to confirm the presence or absence of free hydrochloric acid.

Further experiences with the test were described by Segal *et al.* (1950b), Segal (1951), and Segal *et al.* (1953). It was established that achlorhydria could be differentiated from the presence of free hydrochloric acid by the total quantity of quinine excreted in the first two hours after the ingestion of diagnex. Out of 257 subjects who were known to secrete hydrochloric acid and 85 with proved achlorhydria, only four gave inconsistent results by the tubeless technique.

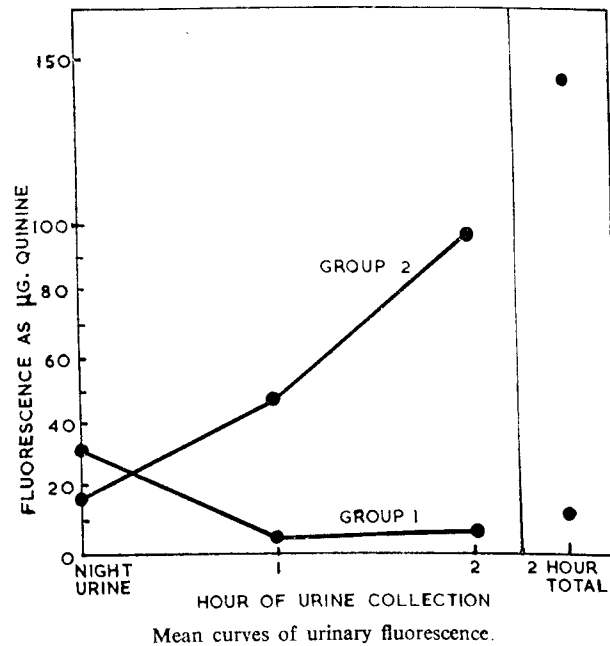
Other favourable reports, in smaller series of cases, were published by Malach and Banks (1952) and Flood *et al.* (1953). Harkness and Durant (1953) made an indicator exchange compound similar to diagnex and showed that patients with free gastric hydrochloric acid excreted considerably more quinine than those with achlorhydria.

Present Investigation

Method.—The patients, none of whom had been ingesting vitamins or drugs containing calcium, magnesium, iron, or aluminium during the previous 24 hours, were investigated in the following manner. After an eight-hour fast the bladder was emptied and the urine saved. Immediately afterwards 0.5 mg. of histamine acid phosphate was injected subcutaneously and 2 g. of diagnex, in 4 oz. (114 ml.) of water, given orally with instructions to avoid chewing the granules. Thereafter the bladder was emptied at the end of one and two hours. The volumes of all three urine specimens were noted and each was treated with ether and sulphuric acid according to the method described by Kelsey and Geiling (1942) for the extraction of quinine. The final acid extracts were compared with a standard solution of quinine sulphate in a Hilger fluorimeter; the natural fluorescence of the night urine (expressed as µg. of quinine) and the amount of quinine in each hourly specimen were then calculated.

Material.—Twenty-two patients were investigated. Intubation studies were performed, usually 24 hours before the diagnex test, in all but four, the exceptions being two with peptic ulceration, one with gastric carcinoma, and one with a partial gastrectomy. For assessing the results of the diagnex test the patients were divided into two groups. Group 1 contained 11 with proved histamine-fast achlorhydria (Addisonian pernicious anaemia, 4; iron-deficiency anaemia, 3; partial gastrectomy, 2; gastric carcinoma, 1; anxiety state, 1), and, in addition, 2 who were not examined by the intubation method (partial gastrectomy, 1; gastric carcinoma, 1). The last two patients were included in this group because it was considered that free hydrochloric acid was more likely to be absent than present. Group 2 comprised 9 patients who were known, or expected, to secrete hydrochloric acid (active peptic ulceration, 6; partial gastrectomy, 2; refractory anaemia, 1).

Results.—In group 1 the total urinary output of quinine in the first two hours after the administration of diagnex ranged from 5.1 to 19.1 µg., and for 8 patients in group 2 from 57 to 319 µg. The Chart shows the wide separation between the mean curves of the urinary fluorescence in the two groups. The remaining patient in group 2 was exceptional in that only 12.8 µg. of quinine was excreted. This patient had a partial gastrectomy, and the fasting juice, when examined previously by the tube method, contained 6.4 clinical units of hydrochloric acid.



Discussion

In this small series of cases the existence of achlorhydria coincided with an excretion of less than 20 µg. of quinine in the total two-hour urine, while, with one exception, the presence of free gastric hydrochloric acid was associated with an output of more than 50 µg. Flood *et al.* (1953) reported similar findings except that the upper limit of urinary quinine in the achlorhydric cases was 25 µg. After long experience with the test, Segal *et al.* (1953) concluded that a firm diagnosis of achlorhydria depended on an excretion of not more than 15 µg. of quinine. These slight differences in the interpretation of the significant urinary quinine level are possibly due to minor variations in the extraction technique. In the group 2 patients no quantitative relationship was demonstrated between the amount of quinine in the urine and the units of acid present in the stomach.

The diagnex test, although still in the experimental stage, promises to be a valuable clinical method of gastric investigation. The patient who refuses or fails to swallow a tube is in no way upset by a procedure which involves only the ingestion of a non-toxic tasteless compound, an injection of histamine, and the collection of urine samples. If further simplification is desired, histamine can be omitted in the first test, but without artificial stimulation a low output of quinine cannot be accepted as evidence of achlorhydria. The test must then be repeated after several days with the addition of histamine. Diagnex itself does not promote acid production to any appreciable extent, and the routine use of histamine is desirable to save time.

Apart from its convenience in patients who are apprehensive about passing a stomach tube, the test has other clinical applications. It is eminently suitable for investigating the incidence of achlorhydria in the general population (Segal *et al.*, 1953), and Malach and Banks (1952) advocate its use, in preference to the conventional tube method of gastric analysis, after recent bleeding from the upper gastro-intestinal tract and after the operation of partial gastrectomy. They report excellent correlation between the diagnex test and the ordinary aspiration technique in nine patients after gastric resection. In the present study four such patients were examined by both methods and the results were conflicting in one: hydrochloric acid was demonstrated by aspiration, but the output of quinine suggested achlorhydria. This may have been due to too rapid emptying of the diagnex, or the hydrochloric acid, from the gastric stump. The interpretation of the standard fractional gastric analysis in patients who have had a partial gastrectomy is often

suspect because of doubt about the position of the tube in the gastric remnant, and it is unfortunate that the tubeless method does not appear to be a completely reliable alternative. Much more experience with such cases is required before the status of the tubeless technique can be properly evaluated.

In the laboratory the only problem concerned the possible significance of natural urinary fluorescence as a source of error. Extraction of normal urines obtained under the exact conditions of the test, except that diagnex was omitted, showed, however, that it did not have an important influence on the results. Apart from the concentrated night urines, the fluorescence did not exceed the equivalent of 3 µg. of quinine in any specimen. Segal *et al.* (1953) recommended that the night urine should be discarded and a control specimen collected an hour later immediately before the administration of the diagnex. This will serve for the recognition of fluorescence due to the ingestion of riboflavine, nicotinic acid, or quinine.

At present the diagnex test is likely to be used only in selected patients, especially those who object to swallowing a stomach tube. Eventually, however, it may become the routine method of gastric analysis, if only for the sake of the patients' comfort.

Summary

The development of a quininium cation exchange indicator compound called "diagnex" and its use to detect achlorhydria without intubation are reviewed.

Experience of the test in 22 patients is described. Achlorhydria was associated with an output of less than 20 µg. of quinine in the urine passed during the first two hours after the oral administration of diagnex.

In general, the results agreed well with those obtained by the aspiration technique, but a discrepancy occurred in a patient who had a partial gastrectomy.

The clinical advantages and applications of the test are discussed.

We wish to thank E. R. Squibb and Sons, New York, for a small supply of diagnex, and Dr. H. L. Segal for stimulating our interest.

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The World Health Organization has published a *World Directory of Medical Schools* (1953) which lists over 500 institutions arranged under countries. Information given includes name and place of each institution; year founded; details of administration; length of the academic year; conditions governing admission of students; numbers of full-time and part-time teachers; total enrolment, by sex; number of new students admitted each year; language in which instruction is given; degrees obtainable and time required to obtain them; annual number of graduates; and annual tuition fees. Information is given in both English and French. The directory reveals that the U.S.A. has 79 medical schools, the U.S.S.R. has 61, Japan 46 (of which 21 have been created since the war), India 34, United Kingdom 27, France 25, and Italy 21. It is obtainable in Britain from H.M. Stationery Office, price 25s.

"LENTE" INSULIN (INSULIN ZINC SUSPENSION): FURTHER STUDIES

BY

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A preliminary trial of "lente" insulin was reported by Lawrence and Oakley (1953). The present paper gives the results of further experience with this insulin in the treatment of diabetics, both in the ward and in out-patients, in the Diabetic Department of King's College Hospital.

The researches of Hallas-Møller, Petersen, and Schlichtkrull (1952) in the Novo Laboratories in Copenhagen, and the characteristics of their three new long-acting insulin preparations, "semilente," "lente," and "ultralente"—insulin zinc suspension (amorphous), insulin zinc suspension, and insulin zinc suspension (crystalline)—were briefly described in the account of the preliminary trial. The first clinical studies of these new zinc insulin preparations with prolonged action were carried out by Hallas-Møller, Jersild, Petersen, and Schlichtkrull.

The results now presented are those obtained with lente, the intermediate form; for reasons given later, we have concentrated at King's on the therapeutic trial of this preparation. The trial has been carried out on two series of cases: (1) in-patients, old and new cases; and (2) out-patients, old and new cases.

In-patients

In all, 29 patients have now been studied, of which 21 were treated and 8 untreated diabetics.

(a) Old Cases

The results obtained in the first 11 cases were described by Lawrence and Oakley (1953). In that paper the conditions necessary for the therapeutic trial of any insulin preparation were laid down.

In the cases described the patient was first stabilized on two injections of soluble, a single mixed injection of soluble and P.Z.I., or a single dose of P.Z.I. or globin insulin, and then changed over to a single dose of lente, equal in size to the total previous dose. The urine was examined for

TABLE I.—Comparison Between Lente Insulin and Other Insulin Preparations

Case No.	Insulin	Blood Sugar in mg./100 ml.				Result
		8 a.m.	Noon	6 p.m.	9 p.m.	
1	40 S.I.+28 S.I. 68 lente	190 180	135 100	190 200	305 75	Better
2	40 S.I.+36 S.I. 76 lente	— 110	190 210	— 115	— 170	Good
3	28 S.I.+20 P.Z.I. 48 lente	210 120	238 140	100 140	110 95	Better
4	28 S.I.+20 P.Z.I. 48 lente	125 135	150 110	150 215	190 220	Same
5	44 S.I.+16 P.Z.I. 60 lente	165 200	260 375	140 260	118 255	Worse
6	20 S.I.+16 P.Z.I. 36 lente	168 105	238 100	95 155	190 155	Better
7	24 S.I.+20 P.Z.I. 44 lente	110 130	155 105	130 110	195 94	"
8	24 S.I.+16 P.Z.I. 40 lente	155 140	210 180	170 135	— —	"
9	28 globin lente	155 165	245 205	165 170	— 250	Same
10	52 P.Z.I. 52 lente	190 95	178 140	195 175	250 180	Better
11	52 P.Z.I. 52 lente	95 70	205 210	240 180	250 210	"

sugar and ketone bodies at 7 a.m., 8 a.m., 11 a.m., noon, 6 p.m., and 9 p.m., and blood-sugar estimations were carried out at 8 a.m. (fasting), noon, 6 p.m., and 9 p.m. These results are summarized in Table I.

In the remaining 10 cases no attempt was made to compare by means of serial blood sugars the degree of control obtainable by the use of lente with that with the older insulins. The total dose of soluble insulin, P.Z.I., or mixture was converted into lente and an attempt then made to control the diabetes by adjusting the dose of lente. Six of these patients received comparable doses of different batches of lente with a view to determining the extent of batch-to-batch variation.

Good control was obtained in five cases, in two the result was fair, in two poor, and in one lente completely failed to control the hyperglycaemia; it is perhaps significant that the only satisfactory method of stabilizing this patient was by means of two relatively large doses of soluble insulin.

In these cases the results are not quite so good. One reason for this is that in the six who received different batches of lente it was essential not to vary the dose even if it proved inadequate at any time during the experiment; temporary shortage of lente insulin at this time also made good stabilization difficult, and, had more been available, at least one case classified as fair would almost certainly have been good.

(b) New Cases

Eight cases of severe untreated diabetes have received lente insulin in hospital; in seven of them no previous insulin therapy was given. Details of this series are shown in Table II.

Heavy glycosuria and hyperglycaemia exceeding 250 mg. per 100 ml. was present in every case, and in all but one there was also severe ketosis. The glycosuria after treatment is expressed qualitatively, the figure representing the mean result of six tests a day over the last four days of treatment. Control was regarded as good if the blood sugar before breakfast was 150 mg. or less, before the midday meal 180 mg. or less, and there was no evening relapse. As judged by these standards the control in six cases was good, in one fair, and in one poor. In the two latter cases 60 units of lente failed to produce good control; in one this was in part due to the fact that the patient was one of those used to compare the action of different batches of lente insulin, and the dose had therefore to be kept at a constant level until there was insufficient time left to study the effect of larger doses, but even allowing for this the response was not good.

In two of these cases five blood-sugar estimations were carried out during the twenty-four hours in order to follow the action of lente (Fig. 1). The course of the fasting and noon blood sugars, glycosuria, ketosis, and dosage of lente insulin is shown in two of the new cases whose control

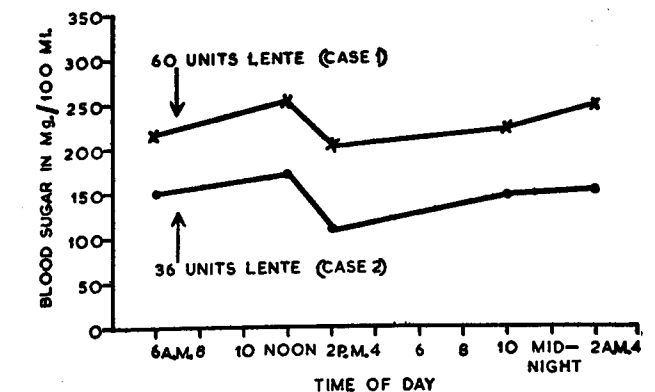


FIG. 1.—Blood-sugar estimations in two new cases treated in hospital with lente insulin.

was classified as good. Glycosuria is expressed in the same way as in Table II (Figs. 2 and 3). In both instances there is seen to be a gradual fall in the level of the blood sugar, disappearance of ketosis, and a reduction in glycosuria; there were no hypoglycaemic reactions. The ketosis persisted for three days in one case and four days in the other, which is a little longer than is usual when two injections of soluble insulin are used at the onset of insulin therapy. All cases classified as good showed a satisfactory gain in weight.

Out-patients

A small series of 14 out-patients have been treated with lente; ten of these were new untreated diabetics and four relatively mild long-standing cases.

The out-patient treatment of new cases of moderately severe and severe diabetes has proved remarkably easy and successful. The results obtained in 6 out of the 10 cases are shown in Table III, and are all regarded as good. In the remaining four cases two were as good as those shown, one was fair, and one looks as if it will be good, but has not yet been on treatment long enough to warrant classification.

The four long-standing cases were all on a single morning dose of P.Z.I., which controlled the blood sugar in the

fasting state but not during the day. In three cases lente improved the control in this respect, and in one the results were unreliable owing to complete disregard of diet.

Batch Variability

It must be realized at the outset that in moderately severe and severe diabetes there is likely to be a day-to-day variation in the course of the disease, and exact similarity of results between different batches of any insulin cannot be expected. It should also be remembered that, from the point of view of this investigation, the degree of control is not of great importance, provided that conditions remain constant and there is no ketosis.

The results of this investigation are shown in Table IV and are regarded as indicating a reasonably close similarity between the hypoglycaemic action of the different batches of lente insulin tried.

Local and Hypoglycaemic Reactions

There have been no significant local reactions to lente insulin in our series of cases. In one patient a change to lente completely relieved persistent painful reactions to P.Z.I.

TABLE II.—New Cases treated in Hospital with Lente Insulin

Case No.	Sex and Age	Before Treatment		After Treatment		Units of Lente			Time in Days	Control
		Glycosuria	Ketosis	Glycosuria 4-day Mean	Ketosis	Initial	Max.	Final		
1	M 40	++++	+++	Tr.	0	40	60	48	18	Good
2	F 20	++++	+++	Tr. to +	0	32	60	36	20	"
3	M 57	++++	+++	S. Tr. to Tr.	0	24	42	36	14	"
4	M 55	++++	Fe+++	+ to ++	0	24	60	60	11	Poor
5	M 25	++++	Fe Tr.	+	0	40	80	60	14	Good
6	F 39	+++	Fe+	++	0	60	60	60	21	Fair
7	F 9	++++	+++	Tr. to +	0	20	32	32	19	Good
8	F 7	++++	Fe Tr.	+	0	20	28	28	9	"

TABLE III.—New Cases treated as Out-patients with Lente Insulin

Case	Sex and Age	Day	Lente Dose	Glycosuria		Ketosis		Noon B./S.	Weight st. lb. oz.	Diet Carbohydrate	Hypoglycaemia
				a.m.	p.m.	a.m.	p.m.				
G. P.	M 30	1	30	+++	+++	+++	+++	360	10-12-8	160 g.	Nil
		3	40	++++	++++	+++	+++	238	11-1-12	160	"
		8	50	++++	++++	0	0	220	11-5-8	160	"
		14	40	Tr.	S. Tr.	0	0	140	11-8-14	160	Noon
		22	40	0	Tr.	0	0	85	11-11-8	160	10 a.m.
A. W.	F 54	29	40	0	0	0	0	88	11-13-10	160	10.15 a.
		1	30	++++	++++	Fe S. Tr.	Fe S. Tr.	330	7-9-14	160 g.	Nil
		8	30	0	0	0	0	120	8-2-12	180	"
		15	30	0	0	0	0	85	8-3-2	180	"
H. V.	F 74	22	30	0	0	0	0	175	8-6-4	180	"
		1	30	+++	+++	0	0	500	8-0-0	100	Nil
		28	30	+++	+++	0	0	430	7-12-13	160	"
		35	30	0	+	0	0	245	8-4-8	160	"
C. T.	F 45	42	30	+++	+++	0	0	150	8-6-0	160	"
		1	20	+++	+++	0	0	350	11-2-8	120	Nil
		21	30	+++	+++	+	+	—	10-13-10	160	"
		29	30	++++	++++	S. Tr.	0	233	11-5-12	160	"
		36	40	+++	+++	Tr.	Tr.	193	11-6-0	160	"
C. P.	M 11	43	40	+	+	0	0	175	11-9-9	160	"
		50	40	S. Tr.	S. Tr.	0	0	110	11-12-10	160	"
		57	40	V. S. Tr.	—	0	—	70	11-12-9	160	"
		64	30	0	0	0	0	110	12-2-12	160	"
L. S.	F 56	1	20	++++	++++	+++	+++	480	6-2-4	180	Nil
		6	30	++++	+++	0	0	260	6-5-0	200	"
		13	24	+	+++	0	0	90	6-8-0	200	"
		20	24	0	0	0	0	62	6-9-11	200	"

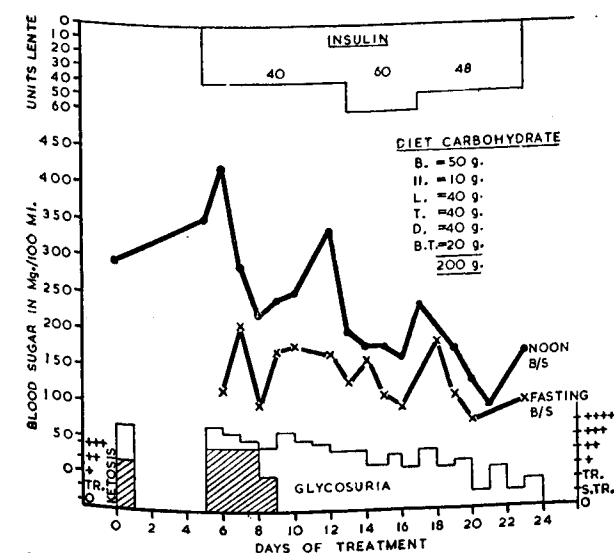


Fig. 2.—Fasting and noon blood sugars, glycosuria, ketosis, and dosage of lente insulin in a male patient aged 40. New case; control good.

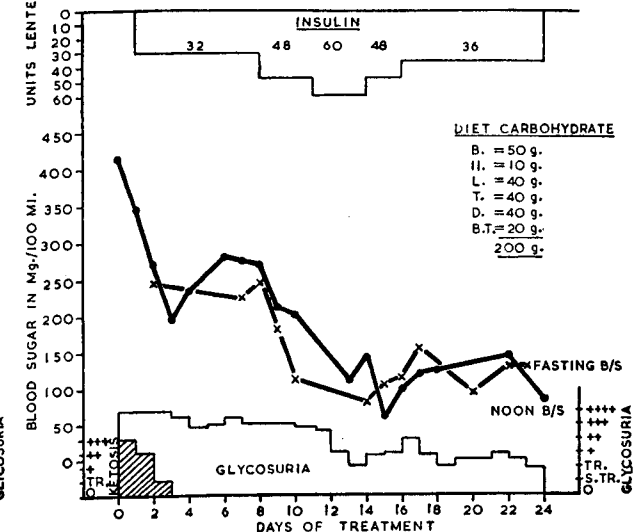


Fig. 3.—Fasting and noon blood sugars, glycosuria, ketosis, and dosage of lente insulin in a female patient aged 20. New case; control good.

There have been remarkably few hypoglycaemic reactions either in the in-patients or in the out-patients. Such reactions as have occurred have been quite typical and relatively mild, except in one or two instances in which the dose given has been clearly too large and had to be greatly reduced.

Reactions have been observed at 10 a.m., three hours after injection, and at noon in the same patient, but not on the same day. The commonest times at which patients on lente insulin before breakfast are liable to have hypoglycaemic reactions appear to be during the morning or afternoon. Nocturnal reactions are uncommon in our experience, and hypoglycaemia rarely occurs in the early hours of the morning.

Conclusion

The reason why we have concentrated on lente insulin is that we think it is the most generally useful of the three preparations and the one which, if any, should be put on the market in the near future. We feel that further knowledge is required to determine whether or not ultralente has, for practical purposes, the same action as P.Z.I. and semilente the same action as globin insulin; if this is shown to be the case then it would seem reasonable to suggest that, if and when these two insulins of the lente series are put on the market, P.Z.I. and globin insulin should be simul-

taneously withdrawn so as to lessen the confusion which would inevitably result from having seven insulin preparations available to doctors and patients at one and the same time.

I wish to thank Dr. R. D. Lawrence for his unfailing interest and advice, and the Novo Laboratories of Copenhagen for generous supplies of lente insulin.

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THE NEW INSULINS—LENTE, ULTRALENTE, AND SEMILENTE

BY

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AND

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Much interest has been aroused in the new insulin preparations of the Novo Therapeutisk Laboratories in Copenhagen (Hallas-Møller *et al.*, 1952a, 1952b; Lawrence and Oakley, 1953; Nabarro and Stowers, 1953). Through the courtesy of Dr. Hallas-Møller supplies of these insulins were made available to us in October, 1952, and since then we have investigated the effects in 28 patients. We have endeavoured to compare the action of these new insulins with that of insulins in current use, and to consider, in the event of their proving to be superior, whether such superiority was sufficient to warrant their introduction for general usage.

Initially, study was made on in-patients in hospital suffering from diabetes of considerable severity but well controlled with various combinations of soluble insulin and protamine zinc insulin, in order to compare the action of these with that of Novo insulins—"semilente," "lente," and "ultralente." Later we tried the new insulins on some patients in whom control was difficult, in the hope that these might give better results.

TABLE IV.—Comparison Between the Hypoglycaemic Action of Different Batches of Lente Insulin.

Batch No.	Lente Units	Fasting B./S.	Noon B./S.	Batch No.	Lente Units	Fasting B./S.	Noon B./S.
12	40	160	150	12	68	354	313
13	40	150	160	13	68	210	280
14	40	160	162	14	68	309	250
15	40	115	154	15	68	270	240
16	40	130	140	16	68	296	255
12	60	198	220	12	60	250	250
13	60	180	230	13	60	233	268
14	60	190	230	14	60	250	260
15	60	176	—	15	60	260	260
16	68	135	200	16	80	180	260
15	68	45	136	15	80	135	250
16	68	77	166	16	80	140	250
		96				50	50
						100	115
						120	110

The investigation was then extended to include a number of out-patients. We hesitated to ask well-controlled patients to stay off work and come into hospital simply for the purpose of trial of a new insulin, while, on the other hand, we thought that a better comparison might be made with the patient continuing under ordinary working conditions. Those selected could be relied upon to carry out accurately all instructions about diet and urine-testing. Several of these out-patients were chosen either because it had been found that in their cases protamine zinc insulin did not have a sufficiently prolonged action, or because they were particularly subject to local insulin reactions.

All the patients were on a measured intake of carbohydrate in the diet, the amount being regulated by appetite but having regard for the maintenance of proper body weight. The daily allowance of carbohydrate was distributed in three roughly equal portions, at breakfast, lunch, and tea, with snacks between and a small late supper—for example, 285 g., distributed as follows: 8 a.m., 75 g.; 10 a.m., 15 g.; 12.30 p.m., 75 g.; 2.30 p.m., 15 g.; 5 p.m., 75 g.; 9 p.m., 30 g. Protein and fat in the

diets were not measured, since the quantity of these consumed varies so little from day to day.

Blood-sugar estimations were carried out by the method of Nelson (1944). Urine tests were done on samples collected before meals and after the bladder had been emptied half to one hour previously. In the case of out-patients, control was estimated largely by the result of urine tests, but in some of these, as in all in-patients, blood-sugar estimations were made.

Results

Details of the 28 patients investigated are summarized in Table I. It will be seen that they varied in age from 14 to 72 years, and that the length of time they had been diabetic varied from a few months to over 20 years. Of these patients 15 were female and 13 male. The results of blood-sugar estimations are shown in Table II. Some of the values were low, but were not associated with hypoglycaemic symptoms.

Lente.—From our observations we concluded that lente insulin had an action similar to that of a mixture of soluble and protamine zinc insulins. In every patient formerly controlled on a mixture of these, control was at least equally

TABLE I.—Details of the 28 Cases.

Case No.	Sex and Age	Duration of Diabetes (Years)	Control Original	Dietary Carb. hydrate (g.)	Insulin (Units)		Local Allergy		Control with Novo
					Original	Novo	With P.Z.	With Novo	
1	F 22	6/12	Good	165	{Sol. 24 P.Z. 12	Lente 36	—	—	Improved
2	F 18	6/12	"	300	{Sol. 56 P.Z. 28	" 84	—	—	Equal
3	F 57	5	Fair	195	{Sol. 24 P.Z. 12	" 36	—	—	Improved
4	M 46	3/12	"	345	{Sol. 40 P.Z. 20	" 60	—	—	"
5	F 20	1	Good	225	{Sol. 64 P.Z. 32	" 96	—	—	"
6	F 47	9/12	"	210	{Sol. 16 P.Z. 8	" 24	—	—	Equal
7	M 58	9	"	210	{Sol. 20 P.Z. 10	" 30	—	—	"
8	F 23	3	Variable	195	{Sol. 80 P.Z. 40	" 120	—	—	"
9	F 34	2/12	Good	255	{Sol. 24 P.Z. 16	" 40	+	—	"
10	M 31	10	"	270	{Sol. 36 P.Z. 24	" 60-68	—	—	Improved
11	F 34	10	"	300	{Sol. 20 P.Z. 16	" 36	—	—	"
12	M 40	13	"	300	{Sol. 20 P.Z. 20	" 40	—	—	Equal
13	M 26	1½	Variable	270	{Sol. 24 P.Z. 24	" 48	+	—	Improved
14	M 23	7	Good	300	{Sol. 80 P.Z. 80	" 120	—	—	Equal
15	F 72	21	Fair	240	a.m. Sol. 28 p.m. Sol. 28	" 56	—	—	—
16	M 43	6	"	255	a.m. Sol. 24 p.m. Sol. 24	" 48	—	—	—
17	M 37	18	Good	210	Globin 40 a.m. Sol. 20	S.L. a.m. 24 S.L. p.m. 24	—	—	Improved
18	F 58	11	"	240	{Sol. 12 P.Z. 6	Lente 40	—	—	Worse
19	M 31	4½	"	315	P.Z. 104	" 38	—	—	Improved
20	F 14	1	"	285	P.Z. 120	U.L. 104	+	—	Worse
21	M 58	30	Poor	210	P.Z. 36	Lente 120	+	—	Improved
22	M 16	4	Variable	225	P.Z. 100	U.L. 36	—	—	—
23	M 28	11	Good	200	P.Z. 60	U.L. 100	—	—	—
24	F 46	3	"	120	P.Z. 24	U.L. 60	+	—	—
25	F 44	5	Fair	225	P.Z. 44	U.L. 24	+	—	Worse
26	M 45	4	Poor	310	P.Z. 64	U.L. 64	+	—	Improved
27	F 45	22	Variable	250	P.Z. 44 Sol. 16	U.L. 32 U.L. 68	+	—	Worse
28	F 46	19	"	210	Globin a.m. 40 Globin p.m. 20	U.L. 48 S.L. a.m. 40 S.L. p.m. 40	+	—	Improved

TABLE II.—Blood Sugar mg./100 ml.

Case No.	Insulin (Units)	Fasting	Forenoon	Noon	Afternoon	Before Tea	Evening
1	{Sol. 24 P.Z. 12 Lente 36	165	—	38	170	165	—
2	{Sol. 56 P.Z. 28 Lente 84	72	—	34	32	120	—
3	{Sol. 24 P.Z. 12 Lente 36 Sol. 24 P.Z. 12	320 99 406	240 138 152	131 57 28	—	81 99 65	— 244
4	{Sol. 40 P.Z. 20 Lente 60 Sol. 40 P.Z. 20	260 168 314	340 256 238	270 76 147	—	189 82 180	—
5	{Sol. 64 P.Z. 32 Lente 96	151	208	144	47	—	120
8	{Sol. 80 P.Z. 40 Lente 120 " 140	96 72 92	—	199 243 280	152 275 267	118 300 162	—
9	" 40	110	175	110	75	—	98
12	{Sol. 20 P.Z. 20 Lente 40	340	—	225	332	—	—
13	" 48	204	—	99	168	218	—
14	{Sol. 80 P.Z. 80 P.Z. 120 Lente 120	98 54 110	84 175 147	56 80 41	—	129 161 70	126 162 128
15	a.m. Sol. 28 p.m. Sol. 28 Lente 56	272 76	164 30	72 48	165 81	274 201	—
16	a.m. Sol. 24 p.m. Sol. 24 Lente 48 a.m. S.L. 24 p.m. S.L. 24	326 125 110	189 178 196	97 53 124	—	162 46 168	240 — 136
20	P.Z. 120 U.L. 120	70 62 50 34	176 — —	126 310 368 290	223 271 391 340	165 246 429 336	— — 264
21	P.Z. 36 Lente 36 U.L. 36	378 326 140	389 221 414	270 123 307	318 256 302	170 298 55	—
22	P.Z. 100 U.L. 100	250 85	48 304	108 254	224 358	206 252	—

good when lente was administered, while in a number of cases rather more even control throughout the 24 hours was noted. There was some advantage in that with the use of lente the trouble of making a mixture of two insulins was avoided.

The results obtained in two of these patients are shown in Figs. 1 and 2. It will be noted that, while they were well controlled with lente, in Case 3 previous control had not

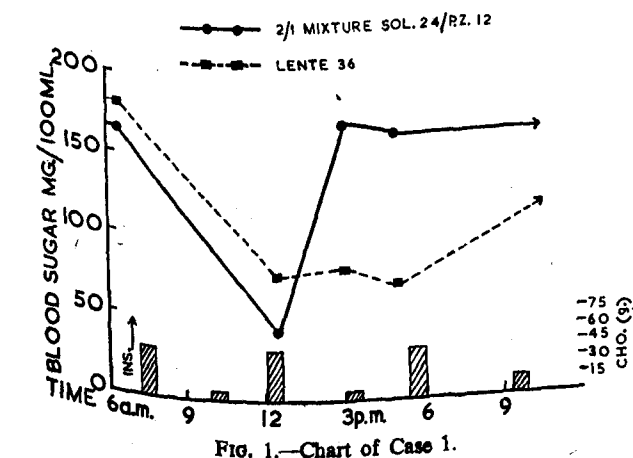


FIG. 1.—Chart of Case 1.

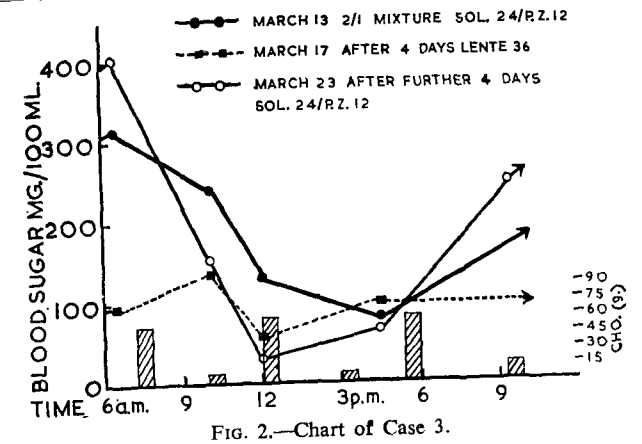


FIG. 2.—Chart of Case 3.

been completely satisfactory. The blood-sugar values given in Table II for Case 8 would seem to show that the results obtained with lente were much inferior to those with a mixture of soluble and protamine zinc insulins. Actually we concluded that control was equal by either method, but this patient showed great variability. Although no other series of blood-sugar estimations was carried out while she was having the mixture, occasional examinations on various days gave values at least as high as those with lente.

In three cases in which lente was used the patient had previously been having morning and evening injections. In one (Case 18) the result was extremely satisfactory. In the other two (Cases 14 and 16), although the fasting blood-sugar level was normal, the levels during the early part of the day were too low.

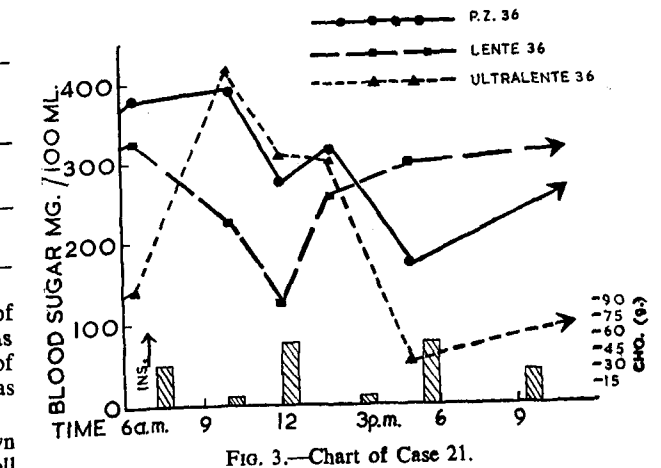


FIG. 3.—Chart of Case 21.

Ultralente.—We found that ultralente had a more prolonged action than protamine zinc insulin, but when used alone it failed to control hyperglycaemia for several hours after injection. It is apparent in Fig. 3 that control on protamine zinc was poor. The explanation is that, although the patient was continued on this insulin, the dose, on account of hypoglycaemic attacks each afternoon, was reduced until these were eliminated.

Semilente.—We have used semilente in an insufficient number of cases to be able to draw definite conclusions, but its action appears to resemble that of soluble insulin.

Local Allergy.—Troublesome local insulin reactions are commonly encountered, as has been pointed out by Paley and Tunbridge (1952). This was a feature in eight of our cases, all of which had been receiving protamine zinc insulin either alone or in a mixture. On changing to lente or ultralente local allergy was immediately eliminated in every case.

Use of a Mixture.—Recently we have tried in one case (Case 26) a mixture of ultralente with lente, and in another (Case 27) ultralente with semilente. In the former, protamine zinc failed to control the man properly, urine tests were bad, and he became thirsty at night. The thirst was relieved on change to ultralente, but the tests still showed considerable glycosuria. He was then given a mixture of 52 units lente with 32 units ultralente, and he is now under better control than ever before. In the other case, a woman who has been diabetic for 22 years, control was very variable. Best control was obtained with separate injections of protamine zinc 44 units and soluble 16 units. She was then given 68 units ultralente. With this she became thirsty in the late afternoon and tests were bad, but in the early morning the urine was almost sugar-free. Eventually she was given a mixture of semilente 28 units with ultralente 48 units. This was a very definite improvement, as judged by urine tests, and she remained symptom-free and without hypoglycaemic attacks, of which she was always afraid.

It will be observed from Table I that no conclusion has been made regarding control with novo insulin of five patients (Cases 15, 20, 21, 23, and 28). In the first four of these the results seemed to suggest that a mixture of lente with ultralente might have proved very satisfactory, and until this has been tried it seems premature to judge the efficacy of novo insulins in these cases. The remaining case showed such fluctuations in control, associated with frequent asthmatic attacks, that comparison between different types of insulin was impossible.

Failures.—In two cases, previously well controlled, change to novo insulin was followed by rapid deterioration. Both were out-patients, and with the reappearance of diabetic symptoms they, on their own initiative, abandoned the new insulin and resumed that which they had been taking before. The first (Case 17) was a very intelligent man, a research chemist, extremely careful about diet and accurate in urine tests. On changing from globin insulin to lente he steadily became worse, and even a considerable increase in the dose of lente failed to correct this. With resumption of globin control was regained. The other patient (Case 25) was tried with ultralente because she was having much trouble with "lumps." All the urine tests very soon became bad and she developed thirst. Within two days of the resumption of protamine zinc control was restored. We have not so far had an opportunity of investigating the cause of the failure of novo insulin in these cases.

Conclusions

We considered that control obtained with the new Novo insulins was rather better in 14 and equally good in 7 of the 28 diabetic patients in whom trials were made. In two cases the results were definitely worse.

In four of the remaining five cases we have not felt justified in drawing definite conclusions on the relative merits of the old and new types of insulin, since the possibility of control with a mixture of lente and ultralente has not yet been investigated.

Lente insulin appeared to have an action similar to that of a mixture of soluble and protamine zinc insulins and thus had the advantage of avoiding the trouble of making such a mixture. In some cases it seemed to exert a more even action than such a mixture.

Ultralente was found to have a more prolonged action than that of protamine zinc insulin, but when used alone it rarely effected control in the early part of the day. It has the advantage that a small dose of semilente can be added without losing the effect of the latter, thus avoiding the necessity for separate injections.

Semilente appears to have an action similar to that of soluble insulin.

The Novo insulins available to us were in a strength of 40 units per ml. only, thus necessitating a bulky injection in many cases, but we understand that they may be introduced in double this strength.

The complete absence of local allergic reactions when using the new insulins was striking. In no instance was there any evidence of this, and, even in the eight cases in which insulin "lumps" had previously been troublesome, change to Novo insulin gave immediate and complete relief.

Having due consideration for the necessity of serious reflection before recommending the introduction of any insulin in addition to the series in current use, and admitting that further investigation especially regarding the use of mixtures of lente and ultralente insulins is required, we would nevertheless advise that lente and ultralente insulins be made available for general use. It seems probable that these insulins could control the large majority of diabetics and render unnecessary the use of protamine zinc and globin insulins.

ADDENDUM.—This paper was read at the meeting of the Diabetic Association in Leeds on July 17, 1953. Since that date it has been possible to make further observations on three of the patients (Cases 20, 21, and 23) in whom it was hoped better results might be obtained with the use of a mixture.

Case 20.—On changing from a dose of 120 units lente to a mixture of lente and semilente, 60 units of each, blood-sugar values were: fasting, 175 mg. per 100 ml.; noon, 47 mg.; 4 p.m., 156 mg.; 8.30 p.m., 140 mg. In view of the sharp drop in blood sugar before lunch the dose was altered to semilente 40 units, lente 80 units. Judged by urine tests, control was extremely satisfactory and there have been no hypoglycaemic incidents.

Case 21.—After the trials with lente and with ultralente he was discharged from hospital on his former regime. Later, as an out-patient, he was given lente and ultralente as a mixture, with 20 units of each. With this, control was better than ever before. The tendency to insulin reactions was entirely overcome. Blood-sugar results were: fasting, 64 mg. per 100 ml.; 11.45 a.m., 70 mg.; 4.30 p.m., 57 mg.; 8.30 p.m., 105 mg.

Case 23.—This man has now been taking a mixture—lente 40 units, ultralente 60 units—for six weeks, with satisfactory results.

We are in no doubt that in these three cases the use of a mixture has brought about definite improvement in control.

Investigation of the cause of failure with this insulin in Cases 17 and 25 has not yet been possible.

We are indebted to Messrs. Hendon Laboratories Ltd. and to Evans Medical Supplies Ltd. for supplies of the Novo insulins.

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A study of European methods of dealing with air and water pollution caused by the chemical industry is being carried out by a technical assistance mission arranged by the Organization for European Economic Co-operation. The mission visited various chemical firms in the United Kingdom during the week October 25–31. The Board of Trade emphasized that the mission is confined to studying the problem of pollution caused by the chemical industry. It is not dealing with the problem of "smog," which is not a special problem of the chemical industry, being caused by the combustion of coal in general.

THE INSULIN ZINC SUSPENSIONS

BY

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The insulin zinc suspensions are a group of long-acting insulins recently developed by Hallas-Møller and his colleagues (1952b) at the Novo Laboratories in Copenhagen. They contain insulin precipitated with zinc and resuspended in an acetate buffer. The duration of the hypoglycaemic action depends chiefly on the size and form of the insulin particles. Two basic suspensions were prepared. One, with amorphous insulin particles, had a hypoglycaemic action lasting up to 16 hours, and was called "semilente" (insulin zinc suspension—amorphous). The second contained crystalline insulin, had an action lasting up to 30 hours or more, and was called "ultralente" (insulin zinc suspension—crystalline). Mixtures of the two suspensions remained stable and had the same effect as separate injections. By varying the proportions in the mixture it was possible to obtain insulins with a wide range of duration of action. Clinical trials in Denmark showed that most diabetic patients could be controlled with a single daily injection of a mixture containing 3 parts of the amorphous to 7 parts of the crystalline suspension (Hallas-Møller *et al.*, 1952a). This mixture was called "lente insulin" (insulin zinc suspension), and it is to be noted that the ratio of the two suspensions in this standard mixture was decided after trials in Denmark, using diets somewhat different from those customary in Great Britain. The descriptive features of these three preparations are tabulated below.

British Name	Danish Name	Duration in Hours	Strengths Available (Units/ml.)
Insulin zinc suspension	Lente	app. 24	40 and 80
Insulin zinc suspension (crystalline)	Ultralente	30+	40
Insulin zinc suspension (amorphous)	Semilente	12–16	40

Through the courtesy of the Novo Laboratories we have been studying the actions of these new insulins in the Diabetic Clinic at University College Hospital since October, 1952. The introduction of three new insulin preparations will complicate the management of patients with diabetes, and we have been investigating the possibility of shortening the action of I.Z.S. and I.Z.S. (crystalline) by the addition of soluble insulin instead of I.Z.S. (amorphous), thus making it unnecessary to release the latter as a separate preparation.

Clinical Trials

For the initial studies of the insulin zinc suspensions patients were admitted to hospital. Most of them were selected because they required large doses of insulin and morning and evening injections. They were given a strictly controlled diet with a distribution of carbohydrate suitable for the I.Z.S. (lente) (see Fig. 1). When the insulin dose had been adjusted, blood-sugar levels were studied over a 24-hour period. Capillary blood samples were collected at 8.15 a.m., 10 a.m., 12 noon, 2.15 p.m., 6 p.m., and 11 p.m., and the sugar content was estimated in duplicate by the Nelson modification of Somogyi's method (Nelson, 1944). Urine was collected in six-hour fractions and the glucose content measured by Benedict's method. The insulin was

injected 45 minutes before breakfast. In many of the patients the blood-sugar levels were studied on a number of occasions with different doses and combinations of I.Z.S., I.Z.S. (amorphous), and I.Z.S. (crystalline). At least one clear day was allowed between a change of insulin and investigation of the blood sugars. When repeated studies were made on a single patient the distribution of dietary carbohydrate was kept constant to simplify comparison of the results obtained, although the distribution was primarily devised for use with I.Z.S. and was not really ideal for some of the combinations.

Of the 22 patients studied, 19 were found to need more than 48 units a day of I.Z.S. The three milder cases and 9 of the 19 more severe ones were adequately controlled with I.Z.S. alone. This insulin proved unsatisfactory in

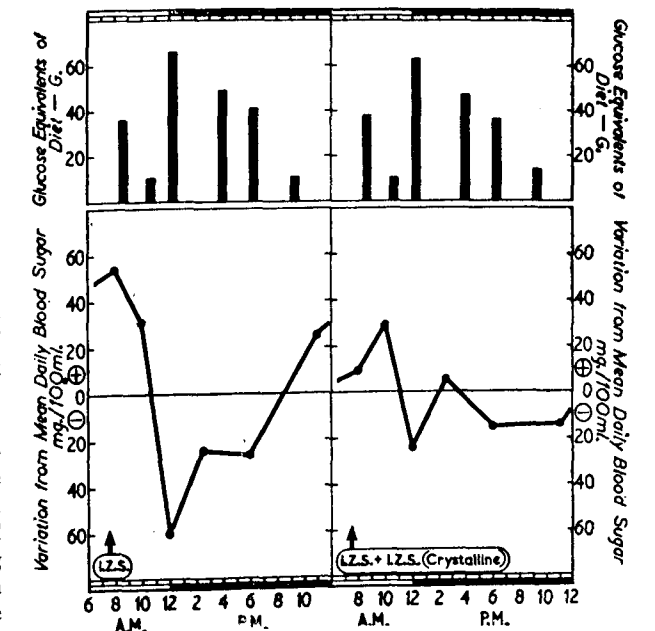


FIG. 1.—Diurnal variations in the blood sugar in patients with severe diabetes poorly controlled on I.Z.S. alone. Mean of six patients. Dose range, 48 to 108 units (mean 72). On the left I.Z.S. alone. On the right the same patients on combinations of I.Z.S. and I.Z.S. (crystalline) in the ratio 1:1 (two patients) and 2:1, 3:1, 4:1, and 5:1 (one patient each). Glucose equivalent of the diet = g. carbohydrate + 58% g. protein + 10% g. fat.

10 patients, all needing more than 48 units a day. One had a very variable insulin requirement, and in another the insulin action in the early part of the day was inadequate. The defect in the remaining eight was an evening and early morning hyperglycaemia. In six it was found that this could be prevented by the use of a combination of I.Z.S. and I.Z.S. (crystalline) in ratios varying from 5:1 to 1:1. These results are shown in Fig. 1. In the two other cases combinations of I.Z.S. and I.Z.S. (crystalline) were not used owing to the high doses needed and the consequent large volume of injection (over 3 ml.) using 40 units insulin per ml.

Thirteen of the 22 patients have subsequently been maintained as out-patients on I.Z.S. or a combination of I.Z.S. with I.Z.S. (crystalline); in addition a further eight have been given the new insulins as out-patients. In one of these the trial was unsuccessful because at the dose level needed with I.Z.S. alone (120 units a day, 80 units per ml.) the patient had nocturnal thirst and polyuria, and it was considered impracticable to use the appropriate combination of I.Z.S. with I.Z.S. (crystalline), as the latter is at present available only in the strength of 40 units per ml. In 15 patients observed over an adequate period as out-patients, the dose of the new insulins can be compared with that previously required. Of the remaining five, one had not needed insulin before and the other four have not been followed for long enough. The dose is almost identi-

cal (± 4 units) in five; in eight the dose of the new insulins is greater (mean +19 units, or 139% of the previous dose); in two the dose is smaller (10 and 24 units less).

A few hypoglycaemic attacks following the insulin zinc suspensions have occurred in hospital. In each case there was good warning and a gradual onset. This experience has been confirmed by out-patients who have had similar attacks.

There have been no local reactions to the injections of the insulin zinc suspensions. I.Z.S. was given to three patients who were having local reactions to soluble or globin insulin; there were no reactions with the new preparation.

Mixing of Insulin Zinc Suspension with Soluble Insulin

The insulin zinc suspensions are preparations at body pH and are designed to cover a range of duration of action from about 12 to 30 or more hours, but, since soluble insulin will always be needed, the question arises whether the action of I.Z.S. could not be shortened by mixing it with soluble insulin, thus dispensing with the need for I.Z.S. (amorphous). There is no phosphate in British soluble insulin, so the danger of precipitating the zinc in I.Z.S. as zinc phosphate does not exist. Soluble insulin, however, is kept at the acid pH of 3 to 3.5 to obtain optimal stability, and the pH would therefore be variable on mixing I.Z.S. and soluble insulin in different preparations. This factor of pH was shown by Hallas-Møller *et al.* (1952b) to control the form and size of insulin zinc particles and thus their prolongation of effect. Insulin exists as a precipitate in the presence of zinc (0.5 to 2 mg. per 1,000 units) in the pH range of roughly 4.5 to 8, and with a pH of between 5 and 6 the precipitate is in the crystalline long-acting form. If insulin zinc crystals are suspended in buffers between a pH of 4.5 and of 8 they remain crystalline, but when amorphous insulin zinc particles are buffered between a pH of 5 and of 6 they slowly become crystalline, and, furthermore, insulin precipitated from added soluble insulin will also be crystalline. Thus the addition of soluble insulin at this pH, so far from shortening the duration of action, will actually prolong it by increasing the proportion of the crystalline particles. This can be seen from the curves shown in Fig. 2. It can also be seen in this figure that the pH of a mixture of a soluble insulin and I.Z.S. cannot be

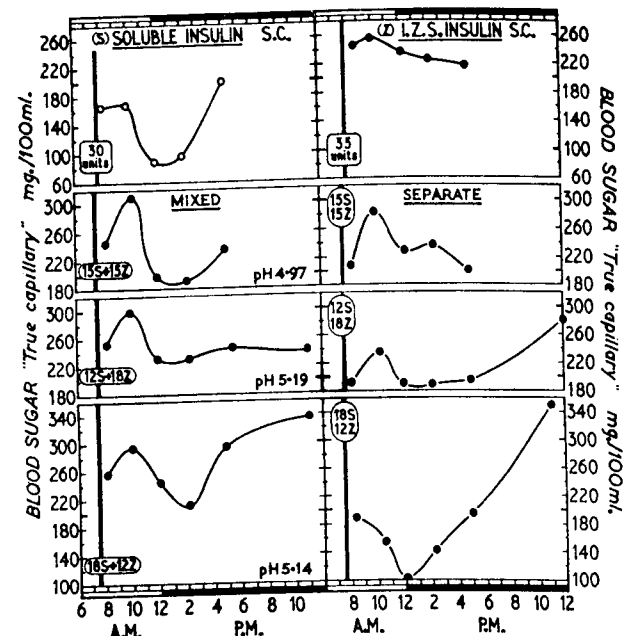


FIG. 2.—Comparison of blood-sugar curves obtained in a patient on a constant diet using varying proportions of I.Z.S. and soluble insulin, given by separate injection (on right) and premixed in phial for 24 hours (on left). Curves obtained with soluble insulin alone and I.Z.S. alone are shown at the top. The pH of the mixtures is recorded.

reliably predicted from the proportions of the two insulins mixed. This is presumably because there is a variable amount of free hydrochloric acid in soluble insulin. If successful mixing of soluble and I.Z.S. is to be achieved, the I.Z.S. must be buffered effectively outside the range at which crystalline precipitation occurs. We have been able to do this with 0.1 M acetate buffer at pH 4.8 added in equal volume to 80 units I.Z.S. per ml. (see Fig. 3).

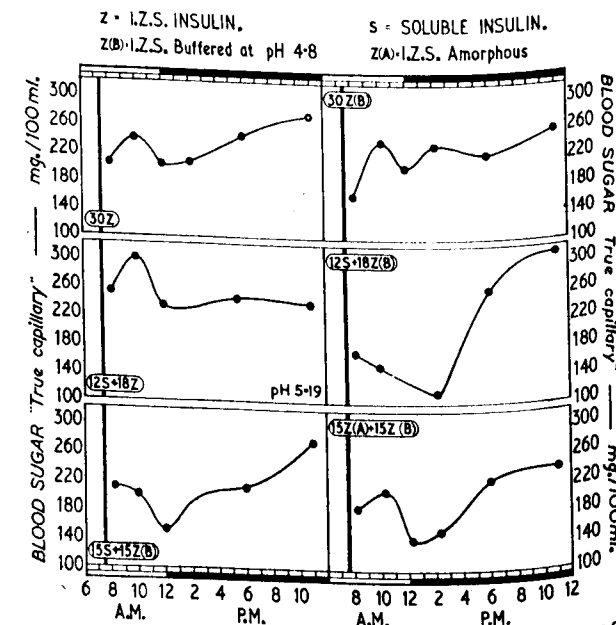


FIG. 3.—Action of buffered I.Z.S. and mixtures of buffered I.Z.S. and soluble insulin. Top: Comparison of the effects of plain and buffered I.Z.S. Middle: Comparison of the mixtures of soluble with plain and buffered I.Z.S. In the former (final pH 5.19) the prolonged hypoglycaemic action suggests that additional I.Z.S. (crystalline) has been formed. Below: Comparison of mixtures of soluble and buffered I.Z.S. and I.Z.S. (amorphous) and buffered I.Z.S., showing that the addition of soluble insulin has the same effect as the addition of I.Z.S. (amorphous).

The final concentration of zinc in the mixture is important. Hallas-Møller *et al.* (1952b) have shown that the minimum effective concentration is about 0.5 mg. per 1,000 units, and the preparations of I.Z.S. to be put on the market contain 2 mg. per 1,000 units. To lower the zinc concentration below the critical level at least three volumes of soluble insulin would have to be added to one of the suspension, and this would be most unlikely to be required in practice. In mixtures of soluble insulin with I.Z.S. buffered at pH 4.8 the soluble insulin is at once precipitated, and at this pH the precipitate is in the amorphous form. Further study of this buffered I.Z.S. is required, but it seems likely that with its introduction it should be possible to dispense with the I.Z.S. (amorphous) as a separate preparation.

Discussion

The introduction of three new insulins will complicate the management of patients with diabetes mellitus and should be done only if there is good evidence that they are an improvement on the preparations at present in use. P.Z.I. alone is suitable for the control of mild diabetes but in the more severe cases soluble insulin is also necessary in the morning and sometimes in the evening as well. The varying excess of protamine in P.Z.I. makes it unwise to mix soluble insulin and P.Z.I. in the syringe or to inject them at the same site; for efficient and consistent control separate injections are required. A single dose of globin insulin given one hour before breakfast is effective in many patients needing less than 48 units a day, but in more severe diabetes early morning hyperglycaemia necessitates a second injection in the evening. Both P.Z.I. and globin insulin contain foreign protein, and sensitization reactions at the site of injection are not uncommon. Isophane (N.P.H.)

insulin has recently been made available in this country. It does not contain any excess of protamine and can therefore be satisfactorily mixed with soluble insulin. There is some evidence that the duration of action of isophane insulin is too short for a proportion of severe diabetics: it contains a foreign protein and may give rise to allergic reactions. The most outstanding defect of the long-acting insulins at present available is that most diabetics who need more than 48 units a day require morning and evening injections.

The originators of the insulin zinc suspensions claim that a single daily injection is enough for the great majority of diabetics requiring insulin. The standard mixture I.Z.S. (lente) is reported to be suitable for 85 to 90% of cases (Hallas-Møller *et al.*, 1952a); in the remainder a combination with I.Z.S. (amorphous) or I.Z.S. (crystalline) is necessary. These claims were confirmed by Lawrence and Oakley (1953), who obtained good results with I.Z.S. in 11 patients, 7 of whom needed more than 48 units a day. We have made detailed studies of the action of the insulin zinc suspensions in 22 diabetic patients in hospital. Our findings suggest that a single daily injection of the new insulins will be satisfactory in over 90% of diabetics, but in 40% of the more severe cases I.Z.S. (lente) used alone had too short an action, and a combination of I.Z.S. with I.Z.S. (crystalline) was required. The composition of the standard I.Z.S. mixture (lente insulin) was decided on the results of trials in Denmark using diets in which slightly more than half of the day's allowance of carbohydrate was taken before 2 p.m. In a recent memorandum published by the Novo Laboratories it is recommended that the ratio of carbohydrate taken at breakfast and lunch to that taken later in the day should be 120 : 80 or 3 : 2. In the diets in use at the diabetic clinic at this hospital the ratio is 1 : 1. It seems possible that although the standard I.Z.S. mixture with three parts I.Z.S. (amorphous) to seven parts I.Z.S. (crystalline) is optimal for the Danish dietary habits, a ratio of 2 : 8 would be more suitable in this country.

The duration of action of the standard I.Z.S. mixture can be lengthened by combining it with I.Z.S. (crystalline) in varying proportions. We have supplied our patients on such mixtures with phials of the premixed insulin so that the technical difficulties of mixing in the syringe are avoided. Use of these combinations in severe cases is limited by the strength of I.Z.S. (crystalline) available. The patients who might benefit most from the insulin zinc suspensions are those at present requiring large doses of insulin and two injections a day. However, unless the I.Z.S. (crystalline) is made available in the strength of 80 units per ml., many of them will be unable to take advantage of the new preparations.

Our studies have confirmed the value of the new insulins, but have indicated minor modifications that might simplify their introduction. In this country a standard mixture with two parts of amorphous to eight of crystalline may prove more suitable than the present lente mixture, and mean that fewer patients will require combinations of two types. If the standard mixture can be suitably buffered it may be possible to shorten its action, when this is necessary, by the addition of soluble insulin, thus dispensing with the need for I.Z.S. (amorphous). In only one of our patients has it so far proved desirable to shorten the action of I.Z.S. The I.Z.S. (crystalline) should be made available in a strength of 80 units per ml.

Indications for the Use of the Insulin Zinc Suspensions

Diabetics at present well controlled on a single daily injection of P.Z.I. or globin insulin are unlikely to benefit in any way from transfer to the new insulin zinc suspensions, unless their present insulin causes allergy. We consider that the indications for trial of the new insulins are: (1) poor control on present insulin; (2) patients at present needing morning and evening injections; (3) patients requiring P.Z.I. and soluble insulin in the morning by separate injection; and (4) patients who show allergic reactions to other types of insulin.

There are also certain contraindications. "Brittle" diabetics whose insulin requirement varies from day to day or during the day will usually be better controlled with morning and evening injections. Patients needing more than 80 units a day are likely to be disappointed with the insulin zinc suspensions at present available, because if they need a combination of I.Z.S. and I.Z.S. (crystalline) they will have to use it in the strength of 40 units per ml.

We have had little experience in the use of insulin zinc suspensions in patients being given insulin for the first time. With P.Z.I. and globin insulin severe local reactions may occur between three and nine months after the injections are started. It seems likely that these will be avoided by the use of the insulin zinc suspensions, and in many new diabetics treatment may begin with the new preparations.

Transfer to the Insulin Zinc Suspensions

It will often be found necessary to adjust both the diet and the insulin dosage when the patients are transferred to the new preparations. The carbohydrate in the diet should be distributed so that the greater part is taken at lunch and tea to cover the period of maximum insulin action. The amount of carbohydrate needed at breakfast-time has varied considerably. We have usually restricted it initially, but in some cases it has had to be increased later on account of morning hypoglycaemia. In all cases we have started with I.Z.S. and the previous total insulin dose. The patients are advised to make the injection 45 to 60 minutes before breakfast, and the importance of shaking the bottle well before withdrawing the insulin is stressed.

Patients are asked to test their urine four times a day during the period of adjustment (before breakfast, lunch-time, and suppertime, and at bedtime). Results of all urine tests are recorded and brought to the clinic on the weekly visits, which are considered desirable during this period. The patients are requested to adjust their own insulin dose if this appears necessary between visits. If the urine contains 2% or more sugar for 48 hours they are advised to increase the dose by 10%. If they experience any hypoglycaemic reactions a comparable reduction is authorized. Reactions may occur at any time of the day, but seem to be most common in the late morning and during the afternoon. They usually indicate the necessity for adjustment of the diet.

In a number of our patients it has become clear after the first few weeks that, although good control can be achieved with I.Z.S. alone during the day, glycosuria is present at bedtime and in the early morning. This suggests that the action of the I.Z.S. should be prolonged by the addition of I.Z.S. (crystalline), and we try first a 1 : 1 mixture, in which the ratio of I.Z.S. (amorphous) to I.Z.S. (crystalline) is 1.5 : 8.5. Some patients can be provided with sterile rubber-capped bottles and allowed to prepare their own mixtures; others have to have this done for them, and special arrangements are required for this in a busy clinic.

Summary

The action of the insulin zinc suspensions has been studied in 22 diabetic patients in hospital. Repeated blood-sugar estimations were performed over a 24-hour period. Insulin zinc suspension (lente) proved unsatisfactory in 10 out of 19 patients requiring more than 48 units a day. In most of these patients the duration of action was too short, and better control was achieved with a mixture of insulin zinc suspension and insulin zinc suspension (crystalline). For this purpose it is recommended that insulin zinc suspension (crystalline) should be made available in a strength of 80 units per ml.

Studies were undertaken to ascertain whether the action of insulin zinc suspension could be shortened by mixing it with soluble insulin, thus dispensing with

the need for insulin zinc suspension (amorphous). It is suggested that this would be possible if the properties of the acetate buffer in insulin zinc suspension were altered, but that further studies are required.

The indications for the use of the insulin zinc suspensions are described, and a plan is outlined for changing patients to the new preparations.

We wish to thank the Novo Laboratories in Copenhagen and Evans Medical Supplies Limited, their distributors in this country, for very generous supplies of these insulins for use in this trial. We would also like to thank Miss A. Moxham, who performed most of the blood-sugar estimations, and the dietitians, sisters, and nurses for the great help they have given us.

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THE CLASSIFICATION OF VARIOUS INSULINS

BY

F. GERRITZEN, M.D.

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In an annotation in the *British Medical Journal* (1953) in which the Novo insulin preparations were announced, attention was drawn to the confusion that might arise when a larger variety of insulins became available. This problem needs extensive consideration for several reasons.

In some cases the new insulin preparations show no superiority over those already in use, but in others they are a distinct improvement. Most doctors who treat diabetic patients use a special brand of insulin, and thus do not take advantage of the intensive research that is going on in the laboratories of the insulin manufacturers.

To choose the right insulin for a certain diabetic patient is not a simple matter. It requires a thorough study of the particular manifestations of the case and a knowledge of the characteristics of the various insulins existing, to adapt the insulin therapy to the individual need. It would be of great value, therefore, if the physician could be guided in the choice of the most suitable insulin, or, if the patient is already using insulin, in making a change that might be of benefit in the particular case.

Principles Involved in Choosing Type of Insulin

In this study a method is recommended which has been described earlier (Gerritzen, 1952), but it might be useful to recall attention to the principles that led to its adoption. Though insulin is used almost exclusively in diabetics, no reliable information can be had from an investigation of diabetic patients because they vary widely in sensitiveness to it. The results obtained would tell us more about the variation in sensitiveness of the patients than about the insulin itself. The same consideration would apply if, in the standardization of insulin, diabetic instead of healthy rabbits were used. The results would be far more uncertain if diabetic rabbits with different degrees of the metabolic

disorder served as test animals. Evidently the diabetic patient would not be a suitable subject for testing the properties of different insulins. Even the average of several diabetics, if an average could be calculated, would not be better, as the average diabetic does not exist.

Insulin is measured in terms of the decrease of the blood sugar after injection. This means that if the decrease in the blood sugar is representative of the action of insulin, all other factors influencing the blood sugar must be excluded. Fasting and exercise, which tend to depress the blood sugar, must be avoided; in addition, emotions and meals, which cause an increase of blood sugar, should also be excluded. Elimination of exercise is easy in the human, as the test persons can be kept in bed. The requirements to exclude meals and to avoid a fasting state led me to give a constant amount of carbohydrate every hour, a method that is not practicable in test animals, because the emotion of forced feeding would undoubtedly influence the blood sugar. Test animals in a state of fasting would get low blood-sugar values when insulin was injected, and a regulating mechanism, of which adrenaline is the most important component, might come into action, thus making the results of insulin action very uncertain.

For these reasons I choose healthy students as test persons. The results obtained in regard to duration and character of the action of insulin would not, of course, apply to diabetics, but they would tell us something about the qualities of the various insulins. This has become of special importance since Hallas-Møller *et al.* (1952a, 1952b) published their method of testing insulin in diabetics. In a great number of diabetics they classified the reaction to different insulins as types A, B, and C; type B being the ideal one, as it gives a flat blood-sugar curve throughout the day. It is necessary to give the A-type (✓) patient an insulin that has a more prolonged action with less intensity during the first few hours after injection, while patients of type C (✓) require an insulin of shorter and more intense action.

This logical attempt to adjust the insulin to the type of reaction of the patient presupposes a knowledge of the differences that exist between the various insulins. This study is an effort to classify the insulins in regard to the duration and character of the action.

The persons tested were lying down from 11 p.m. the night before the experiment started and during the experiment. From 6 a.m. on the day of the experiment they ate 50 g. of mashed potatoes (about 10 g. of carbohydrate) and drank 30 ml. of water every hour. From 7 a.m. the blood sugar was determined hourly by the Hagedorn-Jensen method, until the end of the experiment, which was considered to be reached when the average blood sugar had returned to its original level at 8 a.m.

By this method I was able to classify 13 different insulins without difficulty into four categories according to the duration of the action. Differences in the intensity of the action, as measured by the depression of the blood-sugar level, are shown in Figs. 1-4. The insulin mixtures are described in my previous study (Gerritzen, 1952), but are not considered here.

In an earlier investigation (not published) I found that the sensitivity of healthy students to insulin does not vary throughout the day. Therefore the fact that the prolonged insulins act throughout the evening and night does not affect the results.

Duration of Action

Category 1.—Duration, eight hours. Only two insulins were tested—regular

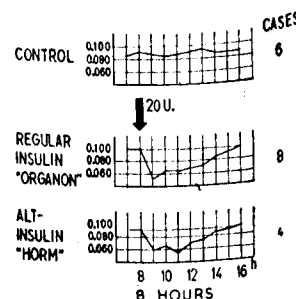


Fig. 1.—Category 1. Duration of action, 8 hours. Both insulins act during the same period of time. Regular insulin (Organon) reaches its maximum in one hour. Alt-insulin (Horm) acts less acutely.

insulin (Organon) and alt-insulin (Horm)—the former acting somewhat more acutely than the latter. In the literature the normal duration of the action of regular insulin in diabetics is given as eight hours, so one may take this value to be well founded (Fig. 1).

Category 2.—Duration, 10 hours. To this category belong N.P.H. insulin (Organon), N.P.H. 50 (Lilly), depot insulin (Horm), semilente (Novo), and zinc insulin "neutrale" (Organon). These show only minor differences in character. The first three insulins are protamine zinc insulins: N.P.H. insulin and N.P.H. 50 being cloudy suspensions and depot insulin (Horm) a clear solution. The last two insulins are zinc insulins, consisting of zinc and insulin only (Fig. 2).

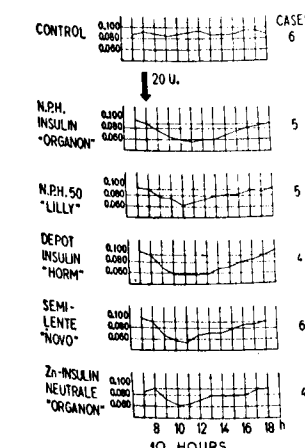


Fig. 2.—Category 2. Duration of action, 10 hours. These five insulins have a nearly identical action—only minor variations in intensity.

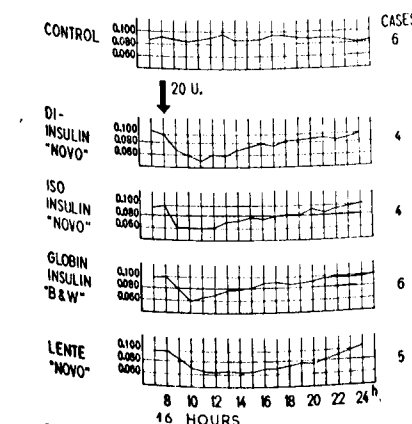


Fig. 3.—Category 3. Duration of action, 16 hours. Of the insulins of this class, lente has the smoothest action.

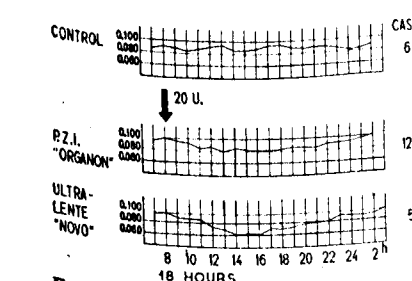


Fig. 4.—Category 4. Duration of action, 18 hours. These insulins have the most prolonged action of all the insulins at present on the market.

diabetic patients (Figs. 3 and 4). This is a question of individual sensitivity more than an indication of the character of the insulin. Hallas-Møller's method of arriving at the most suitable insulin seems logical, but a knowledge of the differences existing between the various insulins, measured under standard experimental conditions in an identical test material, is a prerequisite for its practical application.

The description of these insulins, which comprise only a few of those on the market, leads to the question whether one preparation is preferable to another of the same category. This question I have not tried to answer.

Summary

Thirteen different insulins have been tested in young healthy students under standard experimental conditions—that is, absolute rest and a constant hourly intake of carbohydrate and water.

These insulins have been classified into four categories, according to the duration of the action, with the object of simplifying the choice of the most suitable insulin.

I have to thank Miss S. P. I. Hoogveen for accurate and numerous blood-sugar determinations, and the managements of Burroughs Wellcome, Hormonchemie, Novo, and Organon for financial support.

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Medical Memoranda

An Early Fatal Reaction to Blood Transfusion

Fatal haemolytic transfusion reactions due to specific incompatibility between the blood of the donor and recipient are fortunately rare. The fatal haemolytic reaction here recorded was the result of confusing the recipient's name with that of the donor's label, both donor and recipient having the same surname. The duration of the reaction, which was four hours, must be regarded as one of the shortest on record.

CASE REPORT

After an abdomino-perineal excision of the rectum for carcinoma on February 10, 1953, a man aged 54 received 2 pints (1,140 ml.) of blood of his own group, O rhesus-positive, followed by intravenous dextrose-saline. In the early hours of February 11, on account of bleeding from the perineal wound, the night sister, thinking that the patient required more blood and acting on unreliable information that the blood had been prepared and would be available in the pathological laboratory, went to the blood bank about 3.30 a.m. and, on finding a bottle with a donor's label bearing the name Moon (which was the patient's name), took it to the ward and began the transfusion. The blood was group B rhesus-positive, and did not bear a compatibility label. It ran very slowly from 4 to 5 a.m., when it stopped. The resident doctor, after relieving the blockage in the needle, allowed the blood to flow rapidly from 6 to 6.20 a.m., when the patient had a severe rigor lasting 10 minutes. He had pyrexia and a rapid pulse, and seemed distressed. For the next three and a half hours, until his death at 10 a.m., he had suffered from severe shock, with pyrexia, rapid pulse, increased respirations, and epigastric pain. He had survived four hours after receiving a rapid transfusion of about 300 ml. of incompatible blood.

Post-mortem Examination.—This was conducted about two hours after death and revealed little retroperitoneal haemorrhage. The blood serum was very haemolysed. When anti-B serum was mixed with the patient's cells there was no agglutination, indicating that complete, or almost complete, destruction of all the transfused cells had taken place. A comparison of pre- and post-transfusion titres to anti-A and anti-B in the patient's serum was made. (1) The titre of anti-A was 1:8 in both pre- and post-transfusion

samples: this served as a control for the second test. (2) The titre of anti-B was 1:8 in the pre-transfusion sample, and 1:2 in the post-transfusion sample, indicating the absorption of large quantities of circulating anti-B on the transfused cells.

Histology.—The changes in the kidneys suggested a haemolytic reaction: the intertubular blood vessels were dilated and engorged with blood containing clumped masses of red blood cells; the tubular epithelium showed degenerate changes, and the lumina contained brownish granular material and pigment casts; there was oedema of the interstitial tissue. The sinusoids of the liver contained granular pigmented material and clumped red cells. The cerebral capillaries, mainly in the subcortical white matter, showed marked clumping of red cells, with amorphous granular deposits of haemoglobin. There were numerous small perivascular haemorrhages, the red cells in one instance being seen passing through a damaged capillary wall.

Dr. A. F. Ollerenshaw did the blood tests.

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Headaches Caused by Nasal Obstruction

The following case is unusual enough to be worthy of record.

CASE REPORT

A girl aged 18 was first seen in 1946, complaining of frequently recurring severe headaches, localized in the frontal area of the head above and behind the right eye. The headaches were so bad that she often had to stay home in bed, missing school two or three times a week. Inquiry revealed that there had never been any accident to the nose or head. When she was 11 two different ophthalmologists found her eyes to be normal.

On examination the nasal septum was found to be deflected to the right side, high up, causing pressure against the middle turbinate and obstruction in the upper part of the nose. It was thought that the headache was due to frontal sinus obstruction, and the patient was referred to an E.N.T. surgeon, who gave drops to put in the nose. These gave temporary relief and nothing further was done. An x-ray examination was not thought necessary.

The patient was referred to me again in April, 1951. During the intervening four years she had had frequent headaches, to cure which the tonsils and adenoids had been removed once, and the adenoids a second time. The headaches had become continuous day and night for the past six weeks, and had necessitated injections of "omnolon," in addition to codeine and phenacetin tablets, and various headache powders. In February, 1951, she again visited an ophthalmologist and had been fitted with glasses, which improved the eyesight but did not relieve the headaches.

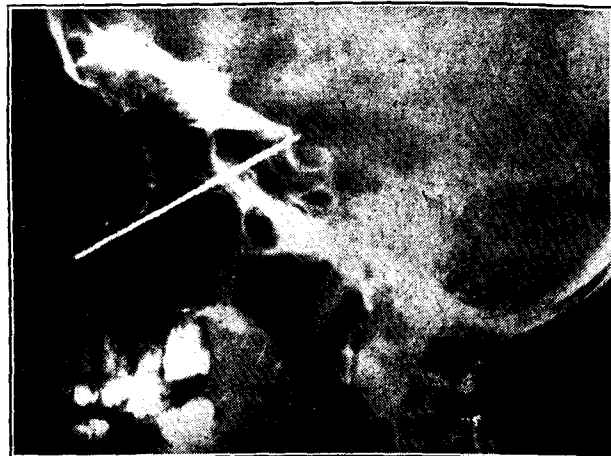


FIG. 1.—Lateral view showing needle in position.

Recently the mother recollected an accident that occurred when the patient was 9 years old. While running down some steps at school she had run into a girl who was holding a knitting needle. Thereafter, her nose bled freely for a few hours. She was, however, able to return to school the next day. This story was dismissed as of no consequence, and as having no bearing on the headaches.

On examination some obstruction in the right side of the nose high up was again found. There was ptosis of the right eyelid. The blood pressure was 120/72. The urine, the cardiovascular and gastro-intestinal systems, and the reflexes were normal. Again a diagnosis of frontal sinus obstruction was made, but on this occasion she was sent for an x-ray examination of the skull. The result was indeed surprising. The radiologist's report was as follows: "A metallic foreign body, some 3 in. (7.5 cm.) in length, projects posteriorly and upwards with a slight lateral inclination from the right nostril. The point has penetrated the base of the skull and lies within the middle cranial fossa lateral to the sphenoid sinus. The ethmoid, sphenoid, and frontal sinuses appear normally translucent and show no evidence of infective change or other abnormality. Both maxillary antra are normal in appearance and no evidence of infection is seen" (Figs. 1 and 2). On clinical grounds it seemed most improbable that the needle was penetrating into the middle fossa and brain, but it was obvious that an operation had to be done at once, and the patient was admitted to hospital.



FIG. 2.—Radiograph showing position of needle and clear antra.

It was thought wise to give penicillin and streptomycin for 48 hours before operation, because of the possibility of a cerebral abscess forming and to prevent post-operative infection. The patient had constant headache and increasing ptosis of the right eye, and she was drowsy, lay curled up on her right side, would do nothing, took no interest in anything, and avoided the light. The leucocytes numbered 8,500, neutrophils 73%, monocytes 6%, lymphocytes 18%, eosinophils 2%, basophils 1%.

Under general anaesthesia the needle was removed through the nose. It was lying on the nasal plate of the maxilla, under the inferior turbinate, and was covered with a thin layer of bone, which had to be broken away before the end of the needle could be freed. When about 1 in. (2.5 cm.) of the needle was exposed it was grasped firmly with forceps and extracted. It was necessary to pull with some force before the needle—2½ in. (6.3 cm.) long—suddenly came away intact. A petroleum jelly and sulphonamide plug was placed in the nose and the patient returned to bed.

For four days headaches continued, but with periods of freedom. From the fifth day onward there were no further headaches. The penicillin and streptomycin were continued up to the tenth day, when the patient was so well that she was discharged from hospital, with the wound in the nose soundly healed. She has since then been completely free of headache, and feels better than she has done for years. The mother states that her outlook on life and disposition have greatly improved.

I wish to thank Dr. E. R. Hafner, under whose care the patient had recently come, for permission to publish this case.

R. C. B. MACRAE, M.B., Ch.B., F.R.C.S.

Reviews

SOCIETY AND GENETICS

The Facts of Life. By C. D. Darlington. (Pp. 467; illustrated. £1 15s.) London: Allen and Unwin. 1953.

This book contains two components—an account of the mechanism of reproduction and inheritance, and Professor Darlington's views on the relevance of this mechanism to certain social and moral questions. It therefore has to be judged on two criteria—its accuracy and lucidity as a piece of popular science, and its perception and originality as a synthesis of biology and sociology.

The so-called laws of heredity, and the remarkable parallelism between the observed behaviour of chromosomes and the segregation of Mendelian "factors," are familiar to all who have read biology, both amateurs and professionals. There are already a dozen good popular books on the subject. Professor Darlington's book has two advantages over earlier ones—namely, that it includes some recent work on the genetics of micro-organisms and on the evolution of immunity to disease; and that it has a good chapter on "the genetic underworld," which summarizes those phenomena of inheritance which pass through the protoplasm and not the nucleus. Unfortunately (we say "unfortunately" because Professor Darlington has great authority as a cytologist, and he could have written an authoritative popular account) these are the only two advantages of *The Facts of Life*. The author evidently underrates the intelligence of people who read scientific books, for he refrains from burdening his readers with many of the facts of life or (for that matter) with many facts. In place of a lucid and thorough exposition of modern views on the genetics and physiology of reproduction, he pads the exposition with what he himself in the preface calls "light entertainment," in the form of quips about incidents in the Old Testament, Russian politics, virgin birth, and Mr. Arnold Toynbee. The chapters are peppered with the sort of querulous pertness one remembers in Samuel Butler's notebooks: only in those days it was a novelty.

Every man to his humour: it may just be the reviewer's sour prejudice to like his science straight. Suffice it to say that, as an exposition of the facts of reproduction and heredity, Professor Darlington's book is of fair average quality, with some new material, but otherwise without any special merits to distinguish it from a dozen others. Therefore the value of the book must rest on the way Professor Darlington develops his thesis that the great questions of society—love and courtship, marriage and divorce, immortality and free will—can be answered, or at any rate brightly illuminated, by reference to the behaviour of chromosomes and the genes they carry, and to the influence on genes of natural selection. Professor Darlington belongs to that almost extinct variety of thinkers, scientific determinists. He is utterly confident that science can analyse not only efficient causes but final causes too. He really does believe that the marriage and divorce laws would be better if they were drawn up by biologists. He summarizes the complex emotional and mental reactions based on pituitary, gonads, and central nervous system, leading through courtship to consummation; "it is to these," he says artlessly, "that we give the name of love." He predicts that on genetic grounds "some five or ten per cent of marriages will fail." He asserts that low agricultural production in England is due to the genetic unfitness of tenant farmers. He provides a genetic reason for the "great illusion" of immortality.

From time to time scientists have to be iconoclasts and they should not respect even the most precious beliefs if these are contrary to fact. But there are rules for scientific iconoclasts. Rule One is never to extrapolate, never to carry your conclusions beyond your data. Nietzsche extrapolated Darwinism beyond the dogs and pigeons and fishes to

European society; and the dreadful fallacy of that extrapolation was demonstrated from 1939 to 1945. Darlington, in a word, offers the reader of *The Facts of Life* a faintly similar extrapolation of Mendelism. Only we are now in a colder intellectual climate than Nietzsche was, and the attempt is not ominous: it simply falls flat. Rule Two for iconoclasts is to break images in the name of the Truth and all the Truth. Now on several occasions Professor Darlington does what he is far too good a scientist to do in his research: he omits relevant evidence. Take, for example, the discussion of twins. Darlington cites in full the observations of Lange on criminal twins, published 25 years ago. This work provides evidence in favour of genetic determinism among identical twins. But, although he quotes one reference in his bibliography, Darlington does not mention that Newman and many others have done work since 1929 which greatly weakens Lange's opinion that the social behaviour of identical twins is almost entirely a matter of nature, not of nurture. In this and in other instances Darlington makes dogmatic assertions without disclosing to his readers that there is evidence inconsistent with his dogmatism. He precedes his book by a pretty Japanese picture and quotations from Chaucer, Montaigne, and Gibbon. It would have been well if he had added Amiel's warning: "An error is the more dangerous in proportion to the degree of truth it contains."

One sometimes hears it said that in a scientific age scientists should have a greater influence in government. Professor Darlington's book should be widely read if only as an awful warning of the horrors which await us if we ever get a scientific oligarchy.

ERIC ASHBY.

CLINICAL ENDOCRINOLOGY

Clinical Endocrinology. By Allan William Spence, M.A., M.D.(Cantab.), F.R.C.P. (Pp. 696; 59 figures. £2 10s.) London: Cassell and Co. 1953.

This outstanding publication has been written by a wise and experienced general physician who at the same time is a first-class endocrinologist with personal experience, over a number of years, in the experimental laboratory and in the wards of a great hospital. It is the best book that has appeared in this field for some years and it will become a standard work for students, postgraduates, and all physicians interested in the subject. The historical notes are brief but fascinating, and the notes on the standardization of hormones give us a mathematical and scientific basis for therapy. The author discusses each gland in a separate section and comprehensively. He considers Cushing's syndrome in its latest aspects, and draws attention to such features as atrophy of the opposite gland in the presence of an adrenal tumour and the therapeutic results of bilateral adrenalectomy, a procedure initiated on a systematic scale at the Mayo Clinic. The basic work of Sheehan in enlarging the scope of our knowledge of Simmonds's disease is well presented. Fröhlich's syndrome appears in proper perspective and the differential diagnosis is discussed with illumination. The hypothalamus finds its appropriate place both in its own right and in relationship to pituitary disorders.

In view of the author's pioneer work with Marine in America and later with Scowen at St. Bartholomew's Hospital, it is not surprising that the thyroid section excels in its account of the physiology and the application of this knowledge to clinical disorders of the thyroid gland. Unfortunately, it has not been possible to add anything reassuring to our present views on the treatment of that very difficult condition exophthalmic ophthalmoplegia, but the author draws attention to radiotherapy of the orbital tissues. This gives some benefit, perhaps paradoxically, in the most advanced cases with considerable oedema of the conjunctiva. The more recent indication that A.C.T.H. may be of value in these cases has not been sustained by further experience. The section on the thymus gland faithfully records the work of Rowntree and his colleagues on the effect of thymic

extracts in successive generations of rats, inducing precocity of growth and development, and the author notes that other investigators have failed to confirm the results. It is now known that there is little likelihood of these experiments being repeated with the same result and that the laboratory circumstances were such as were apt to mislead the original workers. It would therefore be better not to cite this series of experiments any longer, since needless confusion may result. This does not mean that thymic extracts may not have actions as yet unelucidated. The work would not have been quoted so often had not the research workers been men of outstanding ability and integrity who have achieved a great deal in other endocrine fields.

In some respects the chapter on miscellaneous disorders is the most fascinating, and among other subjects the author considers intersexuality, hermaphroditism, sexual precocity, various forms of hypothalamic disorders, adipose gynandrisms, sterility, and hyperinsulinism. The references are comprehensive and the index is clear and adequate.

S. LEONARD SIMPSON.

E.N.T. INTRODUCTION

Ear, Nose, and Throat Diseases for Medical Students. By William McKenzie, M.B., B.Chir.(Cantab.), F.R.C.S. (Pp. 260; 95 figures. £1 1s.) Edinburgh and London: E. and S. Livingstone. 1953.

In his preface the author states that this book is designed to be interesting rather than exhaustive. In the space of only 250 pages are included sketches of the diseases of the upper respiratory tract, oesophagus, and bronchi, and it is striking how much instruction is conveyed in that space. It is evident that the work is founded on the author's own experience, and he makes full use of it in all sections of the subject, though the chapter on deafness stands out as most comprehensive and lucid. A feature of the book is the frequent interpolation of short case histories to illustrate mistakes and successes in diagnosis and treatment, a sure way of interesting the student. The style is naturally didactic and there are some statements which might have been modified to suit the student. The statement that syphilis is a rare disease in this country would better read that throat manifestations of syphilis are now rare. "The function of the semicircular canals and vestibule is that of maintaining the position of the body in space" really means maintaining the knowledge of the position.

The only operations described in detail are tonsillectomy, tracheotomy, and antral lavage, and the accounts are excellent. At the end of each chapter are two or three questions to focus the student's attention on its contents, and at the end of the book come E.N.T. questions from the Conjoint Board examination papers. With his inherited knowledge of E.N.T. history why does the author displace the names of Patterson-Brown Kelly by Plummer-Vinson? The book is a novel elementary introduction to the specialty.

W. M. MOLLISON.

DIAGNOSTIC RADIOLOGY

Modern Trends in Diagnostic Radiology. (Second Series.) Edited by J. W. McLaren, M.A., M.R.C.P., F.F.R., D.M.R.E. (Pp. 413; 359 figures. £3 10s.) London: Butterworth and Co. 1953.

Dr. McLaren, in presenting the second edition of *Modern Trends in Diagnostic Radiology*, might almost have called it "Modern Scandinavian Trends," since seventeen of its thirty contributors come from countries that combine to produce *Acta Radiologica*. This is no bad thing, and the volume reflects the outstanding work that has come from these countries during the past five years.

J. W. Pierce has contributed a valuable survey of the pulmonary manifestations of fungous diseases occurring in Britain and in America. Recent technical developments in rapid film changers, outlined by Schonander early in the

book, give point to a critical résumé by Wegelius and Lind of the problems in cardiac physiology and pathology to which angiocardiology can supply the answer. The reviewer's only regret on reading this section is that space was not found for a more detailed presentation of this work on two-plane simultaneous angiocardiology with synchronous electrocardiographic records. The cases illustrated in this article show clearly how necessary the E.C.G. record may be for an accurate angiocardiological study of the dynamics of the heart. Gunnar Jönsson has contributed an important article on selective angiocardiology and thoracic aortography, with many illustrative cases.

A welcome contribution on the colon comes from Arthur Singleton, of Toronto, and the editor himself writes an admirable survey of the recent work on the small intestine. Frimann-Dahl has by his recent monograph shown himself to be an authority on the radiology of the acute abdomen, and it is fitting that he should have been asked to write on this subject. Other Scandinavian articles of great interest include those by Lindblom on arthrography, Lindgren on abdominal aortography, and Engset and Kristiansen on cerebral angiography.

It is sobering to realize that in 1952 nearly nine million x-ray examinations were carried out in England and Wales, a million more than the year before; and this readable and informative book, with authority in every article, helps to explain that massive increase. The first edition set a high standard, and Dr. McLaren is to be congratulated in having raised it in this second edition.

S. COCHRANE SHANKS.

PARASITIC ANIMALS

Parasitic Animals. By Geoffrey Lapage, M.D., M.Sc., M.A. (Pp. 351; 113 figures. £1 1s.) London: Cambridge University Press. 1951.

The aim of this book, as stated in the author's preface, "is to give, from the biological rather than the economic point of view, an outline of the general principles which govern the lives of parasitic animals." Its title has been chosen to indicate that the kind of parasites concerned are those belonging to the animal kingdom, so that other parasitic organisms such as viruses and bacteria are excluded. In describing, therefore, how parasitic animals live, the scope of the work is limited, if such a word can be used in a field of this magnitude, to certain parasitic species selected from the groups arthropoda, protozoa, and helminths; and, although "not in any sense a text-book of economic parasitology," reference is made chiefly to those parasites which are harmful to man and his domestic animals.

The first two chapters are concerned with a definition of the term "parasitic animal" and a general description of the routes of entry and movements of parasites inside the host's body. Representative life-cycles selected from the three groups are then described in detail. These are illustrated by diagrams which will delight the student of parasitology by their originality and clarity and are certain to arouse the interest of the intelligent general reader. Five chapters are devoted to various aspects of the host-parasite relationship, which include some very interesting and instructive discussions on the effects of parasitism on the parasite and the effects of the parasite on its host. The subjects of host tissue reactions and host immunity are discussed competently. An account of the main principles in the control of parasitic infections follows, and in his conclusion the author discusses a philosophical viewpoint to parasitism and in this reveals an eloquence of style which is in abeyance in his presentation of the factual matter of the preceding chapters. This book contains a wealth of information on the parasites the author has chosen to illustrate his main thesis, and, taken as a whole, is one to be recommended to students and teachers of parasitology, while the general reader will find much interesting material within its pages.

J. J. C. BUCKLEY.

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PROGRESS IN ANTIBIOTICS

We are able to print on p. 1043 an account of a symposium on antibiotics held in the latter part of last week at the U.S. Department of Health, Washington. Contributors to this included many leading authorities in the U.S.A., which has been the birthplace and first testing ground of almost every new important antibiotic since penicillin. The commercial enterprise responsible for this leadership is well known: the immense resources of American pharmaceutical houses have enabled them to conduct costly surveys of many thousand samples of soil from all parts of the world in the hope of discovering new and valuable antibiotic-producing organisms. This has probably been the most rapidly expanding American industry of the past few years, and one in which the reward of success is an immense prosperity which may nevertheless be of short duration. Either some unexpected drawback to the use of the drug may be discovered after the first burst of therapeutic enthusiasm, or mounting bacterial resistance may diminish its value; at any moment, too, something else better may be discovered by someone else. It is this fierce competition which has given us the almost bewildering series of new antibiotics of the past few years.

The news about erythromycin, of which only small quantities for research and other special purposes have yet reached England, is much as might have been expected. This substance, and carbomycin, which closely resembles it, have a range of activity corresponding more closely to that of penicillin than that of their predecessors. Erythromycin has been successfully used for streptococcal infections and pneumonia, but for these conditions penicillin itself remains available. It appears to be unsuccessful in endocarditis except in combination with another drug—streptomycin—in a series of cases reported at this meeting. Its main sphere of usefulness is the treat-

ment of staphylococcal infections resistant not only to penicillin but to aureomycin and terramycin. It should perhaps be reserved for this and any other strictly specific indications, in view of a report from Chicago on the effects of its general use in a hospital. Within a few months the majority of the staff became nasal or throat carriers of a staphylococcus highly resistant to it, and this organism began also to cause infections in patients. Although there are no precise data on the point, it may be suspected that resistance to erythromycin among staphylococci is acquired more rapidly than to its predecessors. If so, this drug should evidently be held carefully in reserve and not used promiscuously.

The principal new antibiotic announced was tetracycline, which is simply the same molecule as that of aureomycin and terramycin (chlortetracycline and oxytetracycline) without either of the attachments which characterize these antibiotics. It has not only been prepared by the dehalogenation of aureomycin, but has been obtained from a new species of mould. It is unusual for the action of a chemotherapeutic agent to be improved by removing something from the molecule: most developments in the past have been elaborations rather than simplifications. It may well be wondered whether further modifications of the basic molecule of tetracycline may not be possible by way of addition rather than subtraction, which will confer superior properties on it. In therapeutic activity tetracycline differs little from its cousins. Its chief advantage is a substantially smaller liability to cause nausea or vomiting and diarrhoea, an improvement for which any patient having to take these drugs for some length of time, as in the treatment of brucellosis, will undoubtedly be grateful. On the other hand, novelty must also be counted one of its principal assets.

Apart from other novelties of little clinical importance, the symposium was devoted largely to discussing better ways of using existing drugs. There are new "dosage forms" of penicillin, and the possibilities of combined treatment have been further explored. The use of two drugs together is now regarded as obligatory in the treatment of tuberculosis, and there are other important indications for it. On the other hand, "blind" therapy with two or more drugs was strongly condemned. There is no doubt that the first condition for success in the use of antibiotics is diagnosis, which can then be followed by the deliberate choice of treatment known to be appropriate.

ISONIAZID WITH P.A.S. OR STREPTOMYCIN

The fifth report of the Tuberculosis Chemotherapeutic Trials Committee of the Medical Research Council on the use of isoniazid in pulmonary tuberculosis is published on another page. Previous reports¹⁻³ have shown that isoniazid is an effective drug and almost devoid of toxicity in the doses used, but that, if given alone, drug-resistant organisms emerge in a high proportion of patients. It has also been established that the combination of streptomycin 1 g. daily with isoniazid 100 mg. twice daily reduces the incidence of streptomycin resistance to a degree comparable with that obtained by combining the same dose of streptomycin with 5 g. of sodium *para*-aminosalicylate (P.A.S. (sodium)) four times a day.

The present report compares the clinical effectiveness of isoniazid 100 mg. twice a day for three months when combined either with streptomycin 1 g. daily (SH group) or with P.A.S. (sodium) 5 g. four times a day (20 PH group). The comparison was made in patients with widely differing types of lesion, though excluding those with chronic disease who, before admission to the trial, were thought unlikely to make any significant response to chemotherapy. As in previous trials, once patients were accepted for the trial they were allotted at random to the different treatment groups. There were 116 in the SH group and 93 in the 20 PH group; the distribution of patients with severe and less severe disease was similar in the two groups, though on the whole the 20 PH patients were rather more ill. The clinical results at the end of three months were very similar. In both groups 90% of patients improved in general condition. Average weight gain in the SH group was a little greater, 12.8 lb. (5.8 kg.) as compared with 10.8 lb. (4.9 kg.). Moderate or considerable improvement in the radiograph occurred in 54% of SH as compared with 42% of 20 PH patients. On the other hand slightly more of the febrile patients in the 20 PH group became afebrile (85% as compared with 79%), and of those with raised erythrocyte sedimentation rate rather more returned to normal (46% as compared with 37%). There was no difference in the rate of sputum conversion as measured at a single examination by direct smear and culture after three months' treatment. It appears, therefore, that isoniazid 100 mg. twice a day given with P.A.S. (sodium) 5 g. four times a day is a very effective treatment, and comparable in results to strepto-

mycin 1 g. daily combined with isoniazid 100 mg. twice a day or with P.A.S. (sodium) 20 g. a day. That 20 PH may be an effective treatment over longer periods than three months is suggested by the very satisfactory results of the tests for drug resistance. In the SH group, in accordance with previous experience, isoniazid-resistant organisms were isolated after three months only from 2 out of 106 patients, or 2 out of the 39 whose sputum remained positive on culture. It had previously been reported that, after three months on isoniazid alone, resistant bacilli were isolated from about 35% of all patients and 65% of those with positive cultures.³ No isoniazid-resistant bacilli were isolated from 89 patients in the 20 PH group, though 30 had positive cultures at three months. Streptomycin-resistant organisms were isolated from only 1 of 106 SH patients. At three months P.A.S.-resistant bacilli were obtained from only 1 of the 89 20 PH patients, though resistant organisms had been detected in 2 at two months. In view of these results and the excellent clinical progress of the cases, the combination of isoniazid 100 mg. twice a day with P.A.S. (sodium) 5 g. four times a day seems assured of an important place in the treatment of tuberculosis. Being spared frequent injections will please the patients, and the value of the combination for home treatment is self-evident.

In the report a supplementary clinical comparison is made in which 100 patients treated with streptomycin 1 g. twice weekly plus isoniazid 100 mg. twice a day (S2H group) are added to the SH cases, and 71 patients treated with 5 g. P.A.S. (sodium) twice a day plus 100 mg. isoniazid twice a day (10 PH group) are added to the 20 PH group. In this way a large group of patients on streptomycin and isoniazid are compared with a second large group on P.A.S. (sodium) and isoniazid. Clinical progress at three months was similar in the two groups, though those treated with streptomycin and isoniazid gained on average rather more weight, and more of them showed considerable improvement in the radiograph.

The preliminary drug sensitivity results in the 10 PH group are promising; isoniazid-resistant bacilli were obtained from only 1 patient after three months. The numbers are at present small, and this combination should not be generally used until more results become available. Most patients can tolerate 10 g. of P.A.S. (sodium) a day without difficulty, and if the early results are confirmed on larger numbers this treatment should prove of great value in domiciliary work and also in backward areas abroad. On the other hand the early drug sensi-

itivity results in the group given streptomycin 1 g. only twice a week combined with isoniazid 100 mg. twice a day provide a warning against the general adoption of this treatment. Isoniazid-resistant tubercle bacilli were obtained at three months from 1% of these patients and 38% of those with positive cultures.

The successive reports from the Medical Research Council on this subject continue to give us information which is notable both for its reliability and for the speed with which it is produced. Great credit is due to those who design the trials, co-ordinate them, and analyse the results. We must also pay tribute to the large number of clinicians, bacteriologists, nurses, and technicians throughout the country, without whose unselfish co-operation the trials, and the benefit they have conferred on patients all over the world, would have been impossible.

INSULIN ZINC SUSPENSIONS

Within recent weeks diabetic patients, encouraged by reports in the newspapers and on the radio, have besieged their doctors and chemists with questions about the insulin zinc suspensions recently developed by the Novo Laboratories in Copenhagen and soon to be available in Britain. Those who have experienced some difficulty in answering will find guidance in the four papers which appear elsewhere in this issue, and in the comment¹ we made nine months ago when Drs. R. D. Lawrence and Wilfrid Oakley² published the results of a small therapeutic trial of "lente" insulin in this *Journal*. The introduction of three new insulin preparations may be welcomed by some because it will improve and widen the scope of insulin therapy, but it is clear that the dangers resulting from confusion between different preparations will be much increased, and correspondingly greater care will have to be taken to ensure that mistakes do not occur. The task of choosing the best preparation or mixture of insulins for the individual patient will now be more difficult, but the principles will remain the same. The duration of activity of an insulin dictates the manner of its use, and Dr. F. Gerritzen (see p. 1030) has performed a useful service by classifying thirteen insulins according to their duration of action, using normal students as subjects. But it must be remembered that insulin often has a longer action in a diabetic than in a healthy person.

The insulin zinc suspensions are not a "new" insulin as many patients may suppose, but are simply the old, familiar insulin in a series of new

garbs. The healthy pancreas secretes insulin in response to a rise in the blood sugar, and there is no reason to suppose that insulin zinc suspensions can imitate this intermittent activity any more closely than those preparations to which we are now accustomed. On the eve of the arrival of the suspensions for general use it is important to consider what advantages they offer. First, they are the only long-acting preparations which contain no protein other than the hormone itself, and it is clear from the papers in this issue that they do not cause allergic reactions in patients who are sensitive to protamine or globin. There is thus a definite indication for the use of an insulin zinc suspension in such patients. Secondly, the combined use of soluble and protamine zinc insulins, as a mixture or by separate injections, has been invaluable in many cases, but it is an inconvenient method, and sometimes inaccurate because of the variable behaviour of mixtures. In such cases it appears that a single daily injection of an insulin zinc suspension may give comparable or even better control with greater convenience. It has usually been considered unwise to administer a single dose of a long-acting insulin in excess of 60 units because of the danger of profound hypoglycaemia, and there is no evidence that the suspensions will be immune from this risk. In the series of cases reported on by Drs. I. Murray and R. B. Wilson (p. 1023), some of the patients receiving doses of 100 or more units had very low blood sugar concentrations at some time in the day, though no hypoglycaemic reactions seemed to have occurred.

Dr. Wilfrid Oakley (p. 1021) has shown very clearly that insulin therapy can be satisfactorily initiated in a new diabetic with insulin zinc suspension (lente), but that the diabetes is controlled less rapidly than it would be with soluble insulin. It is evident that we must continue to use soluble insulin in any patient who is severely ill and when rapid control is essential. The insulin zinc suspensions cannot oust soluble insulin from its traditional place as the insulin for diabetic emergencies. While supplies remain inadequate there is little point in altering the treatment of those patients who are already well controlled by a single dose of protamine zinc insulin. When it comes to choosing between the three suspensions it will probably be found that the mixture containing amorphous and crystalline suspensions—named insulin zinc suspension or "lente"—is the most generally suitable, but it may well prove that the suggestion of Drs. J. D. N. Nabarro and J. M. Stowers (p. 1027) is wise in that a mixture of 8 parts of the crystalline suspension to 2 parts of the amorphous will be better suited to the British diet,

¹ *British Medical Journal*, 1952, 2, 735.

² *Ibid.*, 1953, 1, 521.

³ *Lancet*, 1953, 2, 217.

¹ *British Medical Journal*, 1953, 1, 266.

² *Ibid.*, 1953, 1, 242.

with its emphasis on a late afternoon or evening meal of starches washed down by tea, than the mixture designed for use in Denmark. The plea of the same authors that the insulin zinc suspension (crystalline)—or “ultralente”—should be made available in a strength of 80 units per ml. also deserves commendation.

There will be ample scope for further work in the investigation of these new preparations. For example, it may happen that many severe diabetics can be well controlled by insulin zinc suspension (amorphous)—or “semilente”—given alone night and morning. It remains to be seen whether the Novo insulins can entirely replace any of the preparations of insulin now in common use.

CAUSES OF BLINDNESS

Although by its own nature blindness may command a degree of interest and sympathy disproportionate to any objective assessment of the personal hardships and communal economic loss entailed, nevertheless it represents an outstanding problem and a challenge. The magnitude of the challenge and the nature of the problem are sharply focused in a recent survey¹ by Professor Arnold Sorsby of the causes of blindness in England, which together with his earlier surveys of conditions in England and Wales² and in the wider international field³ provides statistical material of considerable sociological no less than medical importance. The first point which emerges from a study of his most recent review is that the number of registered blind persons in England has in recent years shown a marked increase, standing in 1951 at 83,464. This increase is probably not as depressing as at first sight it might appear, reflecting as it does the increasing longevity of the population, the increasing public recognition of the social and economic benefits accruing from blind certification, the realization that it is not—in some cases at least—an irrevocable acceptance of permanent disability, and the increasing latitude of certifying examiners in registering borderline cases.

Of much greater interest and significance are the figures relating to age and disease distributions. The steady downward trend in those registered during the first five years of life, for which antenatal and neonatal supervision and the efficiency of modern antibiotic and chemotherapeutic agents was responsible, has, as was foreshadowed, come to an end. Indeed the numbers in this age group have shown a slight increase, for which the new, or newly recognized, disease of retrolental fibroplasia added to the hard-core residuum of congenital defects and neoplasms may be at least partially responsible.

¹ *The Causes of Blindness in England, 1948-50, 1953*, London, H.M.S.O.
² *The Causes of Blindness in England and Wales, 1950*, Medical Research Council Memorandum, No. 24, London, H.M.S.O.
³ *The Incidence and Causes of Blindness: An International Survey*, Supplement XIV, *Brit. J. Ophthalmol.*, 1950.

In the years between youth and old age there has been little change of emphasis in the operative causes of blindness, among which myopia, congenital and abiotrophic defects, diseases of the central nervous system, iritis and iridocyclitis, and injury are the most prominent. Of these, probably the first two groups can be alleviated, if at all, only through long-term biological and genetic research, and the last three by early diagnosis and treatment.

In the older age groups there is, as must be expected, a small increase in the numbers of those blind from diabetes and vascular lesions, but perhaps one of the most startling revelations of this survey is that three affections only—cataract, senile macular degenerations, and glaucoma (all afflictions primarily of old age)—are to-day responsible for no less than some 60% of newly registered blindness, and that cataract, an essentially tractable disease, accounts for one half of this larger proportion. Blindness is indeed becoming an increasingly geriatric problem. These three diseases present biological and possibly genetic problems. Senile macular degeneration, in so far as it is not susceptible to control by mechanical means, must for the time being remain insoluble. In glaucoma the main difficulty is that of early diagnosis, which affords the best, but by no means a certain, prospect of controlling visual deterioration. It is disturbing to learn that more than one half of patients blinded from glaucoma had had treatment described on the certifying form as “complete,” although there is no means of assessing at what stage of the disease such treatment was instituted. It may well be that in those in whom the diagnosis was established at an early stage the outlook was much happier.

It is even more disturbing to read that of those newly registered as blind from cataract (some 3,350 annually) no fewer than 4 out of 5 have had no treatment whatever; while those still blind after the completion of treatment number only one in 30 cases. It may be not sufficiently recognized either by practitioners, or perhaps even by those undertaking certification, that the modern operation for cataract is not so much a matter of physical endurance (it does not nowadays involve ten days' complete immobilization and misery) as of morale—to which the prospects of recovery of the ability to read and of a considerable measure of independence will surely contribute very highly. The small risk of loss of the eye to be operated on and the even smaller risk to life involved in the operation must be weighed against the personal happiness and the far-reaching economic amelioration resulting from its successful outcome. It is in a judicious appreciation of these factors, and in the early diagnosis of glaucoma and other tractable diseases, that the profession as a whole can best help.

STUDIES OF MORBIDITY

Our knowledge of disease is at present heavily biased by conclusions reached after studying the more advanced cases to be seen in hospital. The terminal stages are apt to be better known than the initial stages,

and whereas abundant information is available on the distribution of causes of death—in Great Britain at least—the distribution of causes of morbidity is much more a matter of speculation. It is therefore not surprising that epidemiologists, vital-statisticians, and others are looking with some envy on the records kept by general practitioners of their Health Service patients, or the family doctor is uniquely placed to gather data about the earliest features of disease and about those many causes of ill-health that entail misery for the patient but no hospital investigation. Nor are general practitioners unresponsive to the call for more data about the many diseases that are at present escaping the trained research worker's attention. Some are carrying out their own investigation; others would certainly do so if provided with certain necessary facilities; others again would no doubt join them if given the encouragement from a senior that hospital doctors often so enthusiastically acknowledge at the end of their scientific articles. For there is little doubt that, as Dr. W. P. D. Logan says in a report¹ published this week, general practitioners' records “potentially constitute one of the most valuable sources of information on morbidity.”

As a pilot experiment, the doctors in eight general practices have co-operated with Dr. Logan by keeping full records of the work they have done for their patients. The period covered by the report is the twelve months from the beginning of April, 1951, but the doctors are continuing to keep records in order to extend the study. The practices were carefully selected to provide a wide variety of conditions. While it would be rash to draw any very firm conclusions from the morbidity data obtained from eight practices over only one year, the experiment has served several useful purposes. The first is that different forms of record keeping were tried and some experience was gained on the best methods of collecting the data. Secondly, the investigation has confirmed the presupposition that such records as general practitioners will have time to keep can yield valuable information about morbidity. Thirdly, it already points to several lines of study worth following up with more intensive research. As an example of this, the extraordinary differences between the practices in the numbers of patients reporting with the common cold may be cited. The consultation-rate for all the practices combined—that is, the number of patients consulting per 1,000 patients in the practices—was 130 for the common cold. This rate is far above that for any other disease—and indeed sharpens those criticisms that some doctors have made about the trivial uses to which the Health Service is sometimes being put. But more remarkable still is the fact that the rate for one practice was 213 while the rate for another was only 19. The lower rate is one-tenth of the higher, yet for all consultations combined the rate for the second practice was only between one-third and one-quarter of the first. The common-cold rates for the other six practices lay between 80 and 140. Such a wide dis-

parity as that between the highest and the lowest figures can clearly not reflect the incidence of the disease in question but points to some other circumstance. The practice with the high rate is in “a lower working class neighbourhood” of Liverpool, whereas the one with the low rate is a rural N.H.S. practice in Hampshire, so that distance from the doctor probably plays some part. But how great a part it plays is something that might well be worth further inquiry, for in this Liverpool practice of 7,700 souls 1,636 patients consulted the doctors 3,625 times for the common cold in the twelve months covered by the report.

The records of at least another twelve months are to be tabulated in due course to find out how far they confirm those already obtained. A type of investigation that has yet to be carried out is into case histories extending over many years for a few patients. Again, families may be studied as units from such records as these. The College of General Practitioners has been showing a lively interest in research in general practice and might well consider whether it can help in such investigations. Meanwhile, a report of the second twelve months' records will be awaited with interest, and Dr. Logan and his colleagues are to be congratulated on carrying out such an instructive experiment. In the collection of accurate mortality statistics England led the world, and we may hope to do so again in the collection of reliable information on morbidity.

SCIENTIFIC EXHIBITION AT THE ANNUAL MEETING

After the successful exhibitions at Dublin last year and Cardiff this year the scientific exhibition is now well on the way to becoming a permanent and popular feature of the Annual Meetings of the B.M.A. The two exhibitions already held have shown that modern clinical and laboratory investigations, as well as public health field work both at home and abroad, lend themselves well to demonstration by visual methods. The attention of the eye can often be more effectively caught than that of the ear, but the success of an exhibit depends largely on whether the interest aroused by the first glance is stimulated by a closer look. It is here that the exhibitor can exercise his skill and imagination. At the Annual Meeting at Glasgow in 1954 the scientific exhibition will be held from July 5 to 9. It will cover a wide field of medical practice and research. But space is limited, and those who would like to take part should apply for details to the Secretary of the Association as soon as possible. The last date for receiving applications for a stand is December 31.

The next session of the General Medical Council will open on Tuesday, November 24, at 2 p.m., when the President, Sir David Campbell, will take the chair and deliver an address.

¹ *General Practitioners' Records*. General Register Office: Studies on Medical and Population Subjects, No. 7. H.M.S.O., 8s. 6d.

CLINICAL PATHOLOGY IN GENERAL PRACTICE LUMBAR PUNCTURE

BY

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Lumbar puncture was first used as a clinical method by Corning in 1885. Within a few years Quincke in Germany and Wynter in England developed improvements for the relief of raised intracranial pressure. Quincke devised a technique generally similar to that used to-day, and was the first to measure pressures and have the spinal fluid analysed.

In adults the spinal cord ends at the level of the lower border of the first lumbar vertebra. In children it ends at a lower level, and in infancy may reach the level of the third lumbar vertebra. The arachnoid membrane continues down to the level of the second sacral vertebra. There is therefore in the cavity of the lower lumbar vertebral canal a sac containing cerebrospinal fluid (C.S.F.) and the lower spinal nerve roots. Into this sac a needle may be inserted without danger of injuring the spinal cord. The sac is surrounded by a venous plexus. In lumbar puncture the needle enters the sac posteriorly. After passing through skin, interspinous ligaments, and posterior vertebral muscles the needle is guided between two adjacent spinous processes (usually lumbar 3 and 4) through the posterior longitudinal ligament of the vertebral column into the lumbar sac.

The C.S.F. has a circulation in and about the central nervous system. A sample taken from the lumbar region will, with a fair degree of accuracy, indicate the conditions throughout the pathways of circulation. Being so closely related to the central nervous system, the spinal fluid reflects changes in nervous tissue and its accessory parts, the meninges and blood vessels.

From consideration of abnormalities in pressure, cellular content, and chemical composition it is often possible to establish a diagnosis which could not be otherwise made.

Lumbar Puncture in Diagnosis

Lumbar puncture provides *direct* information from the pressure and composition of the spinal fluid; *indirect* information is obtained by the injection of air or opaque media into the subarachnoid space. Lumbar puncture may be combined with puncture of the C.S.F. system elsewhere (ventricles, cisterna magna).

Direct information may be obtained in:

- Infectious Diseases:* meningitis; abscess; encephalitis; myelitis.
- Neoplastic Diseases:* benign tumours; primary or secondary malignant tumours. (Note that lumbar puncture may be dangerous in cases in which the intracranial pressure is significantly raised.)
- Vascular Diseases:* haemorrhage; thrombosis or embolism; haematoma.
- Neurosyphilis.*
- Demyelinating Diseases.*
- Degenerative and Congenital Conditions.* In this group, which includes such conditions as Friedreich's ataxia, amyotrophic lateral sclerosis, and the lipoidoses, curiously enough the spinal fluid is usually normal.

Lumbar puncture should be used only to settle definite questions of differential diagnosis. Routine lumbar puncture is to be deplored. Certain conditions are sometimes aggra-

vated by lumbar puncture: cerebral or spinal tumours when the local pressure and circulation are reaching critical levels; disseminated sclerosis; and psychoneurosis, "hysteria," depression, and cases in which compensation is a factor.

Lumbar puncture may be of special importance in those cases of difficult and obscure illness in which it is all too easy to label the condition as functional or hysterical. The presence of definitely abnormal C.S.F. findings very strongly supports a diagnosis of organic disease.

Lumbar puncture may be used for injection of air, other gases, or opaque substances into the subarachnoid space. By appropriate manoeuvres the medium can be used to show abnormalities within the skull or vertebral canal. Growths and other obstructive lesions give positive findings. Cerebral atrophy is shown by air in dilated ventricles or widened sulci.

For Therapy

Prognosis in the "malignant" forms of meningitis, such as pneumococcal, tuberculous, and influenzal, has greatly changed for the better since intrathecal antibiotic therapy began. Penicillin and streptomycin are now in general use. The maximum intrathecal dose of penicillin is 20,000 units; of streptomycin, 0.1 g. The use of fibrinolytic agents is at present considered hazardous.

The injection of saline under moderate pressure has been advised for those cases of subdural haematoma in which, after the removal of the clot, the brain does not regain its normal shape and position.

The intrathecal use of anaesthetics is a well-established specialized practice. Occasionally serious spinal cord damage occurs after spinal anaesthesia.

Contraindications.—Lumbar puncture is contraindicated: (1) If the practitioner has no positive problem which may be solved as a result of the findings. (2) If there is no prospect of a successful puncture owing to spinal deformity or disease. (3) If it is judged either on the history of the illness (headaches, vomiting, visual blurring) or physical signs (papilloedema, slow pulse, lowered state of consciousness) that the patient has an expanding cerebral lesion (tumour or abscess) which will, if the intracranial tension is suddenly altered, cause complete and irreversible obstruction to the C.S.F. or blood circulation (pressure cone). Occasionally the patient in such a state may die while the puncture is being carried out. Often death is delayed for some hours and the connexion between death and lumbar puncture may escape the unobservant. In these difficult circumstances, ventriculography is necessary. (4) If there is a gross spinal lesion already causing obvious nervous and vascular damage. A complete transverse lesion may rapidly follow puncture. In doubtful cases a neurosurgeon should first be consulted.

Apparatus

At the National Hospital for Nervous Diseases a standard set of instruments, dressings, and towels is provided. The set consists of a cloth container folded in two and tied with tape. The tape is undone by an assistant with sterile forceps. The operator then turns the upper fold back to expose towels on the right, and the instruments and dressings on the left (Fig. 1).

The instruments are kept in a row of pockets. The manometer lies in the centre of the package. Instruments available are: two Greenfield needles with three-way taps and stylets—they are best kept in a metal tube to prevent pene-

tration of the cover and subsequent sepsis; a glass manometer reading up to 300 mm., with a short rubber tube for attachment to the needle; one 2-ml. and one 10-ml. hypodermic syringe, with hypodermic needles to fit the small syringe. A specimen bottle may be included. The package is laid out on a sterile cloth on top of a trolley, with a sterile kidney dish, pair of forceps, pair of gallipots for antiseptics,

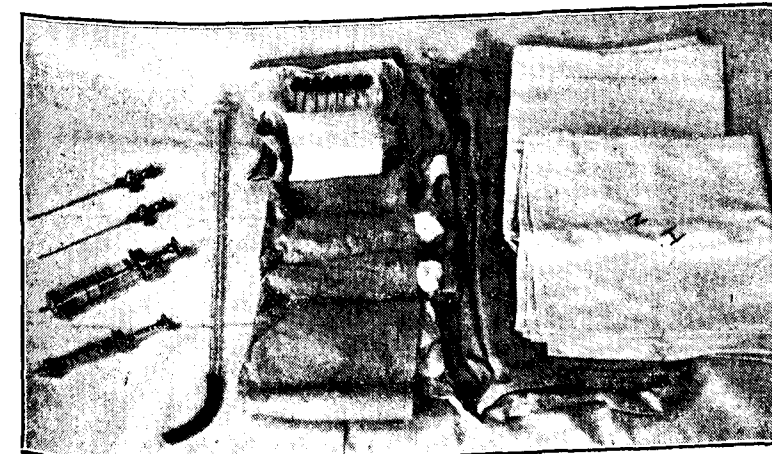


FIG. 1.—Standard set of instruments for lumbar puncture.

and a bowl for extra dressings. On the lower shelf of the trolley are kept: Cheate's forceps in antiseptic; 1-ml. ampoules of 2% procaine hydrochloride; bottles of methylated spirit and 2½% iodine in methylated spirit; and specimen bottles.

Technique

The following method has proved reliable in the hands of a large group of operators over many years, but satisfactory modifications are well known. Before starting, the physician or surgeon should remind himself of a few simple but important facts.

- (1) Lumbar puncture is unpleasant and frightening, not usually from the pain of the procedure but because of apprehension, ignorance, and "old wives' tales," and because the patient cannot see what is happening. He should not be kept in suspense for hours or days. It is best to carry out the puncture as soon as consent has been obtained and the outline of the process explained. Patient and simple explanation repeated as often as necessary, with quiet warning of each move in good time, help greatly in decreasing the strain of the investigation.
- (2) Lumbar puncture may result in an infected spinal fluid, even if the operator is scrupulously careful. If anything is to be injected into the subarachnoid space, the operator is advised to use full aseptic surgical technique, including cap, mask, gown, and gloves.
- (3) The most important single detail in the procedure is the patient's position.
- (4) Haste and force indicate lack of experience and sympathy. They contribute to failure.
- (5) Consideration should be given to the convenience of the pathological services so that specimens arrive in good time for examination.

After due warning to the nursing staff, the operator should carry out his work punctually. He should expect to find the patient behind screens, suitably clothed, and not in a draught. Incontinent patients should be in clean beds. All concerned with the actual puncture should wear masks.

Reliable nursing assistance is essential. If the patient is violent, restless, or confused it is useless to attempt lumbar puncture until an adequate amount of restraint can be provided. Colleagues, students, male nurses, porters, and even other patients may on occasion be required. Many sisters and nurses are efficient in holding restless patients, but if possible they should be spared from duties beyond their physical

powers. The operator should never find himself in the middle of a scrimmage. In extreme cases the patient will have to be overpowered until an anaesthetic can be administered intravenously. The operator should explain the need for the patient being rendered quiet and placed in the right posture for puncture. He should not start at the lumbar puncture until he is sure of a reasonable time for safe work. Calm and deliberateness are essential. Happily, the great majority of punctures are carried out simply and uneventfully.

Patient's Position.—Great care should be taken in ensuring correct posture before anything further is done. The spine must be horizontal and fully flexed. The patient is drawn to the right side of the bed for right-handed operators. His back is exposed. He is told to lie on his left side with his knees up to his chin, his head well bent, and his arms below his knees. One pillow for the head may be useful (Fig. 2). The operator should be prepared to play an active part in this positioning until he is satisfied. The patient is requested to keep quite still in this position. The operator then masks himself and scrubs his hands for five minutes with soap and running water. He returns to the bedside and satisfies himself that the patient is still in the correct position. The assistant undoes the fastenings of the instru-

ment packet and opens it with sterile forceps taken from the lower shelf of the trolley. Small amounts of methylated spirit and 2½% iodine are poured into the sterile gallipots. An ampoule of procaine hydrochloride 2% is opened. Specimen bottles are kept in readiness and material for intrathecal injection should be easily accessible. The operator dries his hands on a sterile towel. (Those experienced in medico-legal work advise the use of sterile gloves, but many operators do not use them for single diagnostic punctures.) The patient is draped in sterile towels, one over his back to the left of the exposed lumbar area, one between his left loin and the bed, and one over his right (upper) loin, hip, and buttock. He is then warned that his back is to be rubbed with methy-

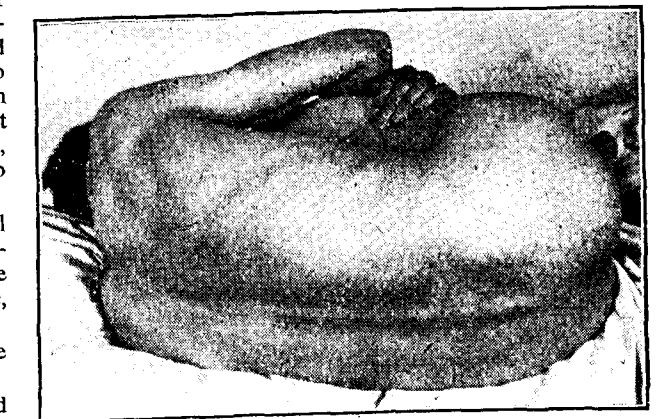


FIG. 2.—Position for lumbar puncture.

lated spirits and that this may be cold. The lumbar region is carefully cleansed, especially in the central area.

Site of Puncture.—The space between the third and fourth lumbar vertebrae is most commonly used. A space higher or lower may be used if difficulties are encountered or if previous use of a space has made the patient's back tender. A line joining the highest points of the iliac crests normally passes between the third and fourth lumbar spines. If necessary the iliac crest can be felt through the sterile towel and the landmarks emphasized by a dab of iodine. A small syringe is filled with local analgesic and fitted with a short fine sharp needle. The patient must be warned that a local analgesic "to make the skin numb" is about to be used and that a prick, in the skin only, will be felt. The skin over the

third and fourth vertebral spines is then firmly stretched by the fingers and a small $\frac{1}{4}$ -inch (1 cm.) diameter subcutaneous weal is raised. A longer needle is slowly inserted through the weal into the deeper tissues, local analgesic being expelled throughout the needle's progress. The patient should be told that one of the worst parts of the procedure is now over.

The Puncture.—The spinal needle is inserted through the centre of the weal. A little firm pressure is sometimes needed to get the point through the interspinous ligament. Subsequent greater pressure on the needle should never be used, for resistance means bony obstruction which must be by-passed and not penetrated. The needle should then be pressed forward, its cutting edge in the same plane as the longitudinal (head to foot) fibres of the dura and ligaments. The point should be directed *slightly* upwards (towards the head). Usually the needle goes in to a depth of about 4.5 cm. with a firm smoothness. Then a ligamentous resistance is easily overcome, with a feeling of a slight "click." If the stylet is withdrawn, C.S.F. may flow from the butt of the needle. If it does not, the stylet must be reinserted and the needle gently and slowly advanced up to 0.5 cm. more. Another "click" may be felt, and C.S.F. then be easily obtained. If none appears, rotation of the needle through a quarter or a half turn may be effective. Lack of immediate success should not dismay the operator. On occasion he may prick a strand of the cauda equina, causing the patient pain in the foot. He may at times repeatedly encounter a vertebral bone. He may find pure blood instead of C.S.F. coming from his needle. Under such circumstances he should not use force or advance the needle further. (The needle should never be inserted so deep that less than 1 cm. remains between the skin and the connexion with the tap.) It must be withdrawn 2-3 cm. and a slightly different line taken. If the patient has complained of pain in the right leg or foot the point has clearly been too far to the right of the midline. If the needle is not withdrawn far enough before reinsertion it is likely to take the same course twice. Rarely it may be advisable to try an insertion slightly lateral, or in a space above or below, after suitable analgesia.

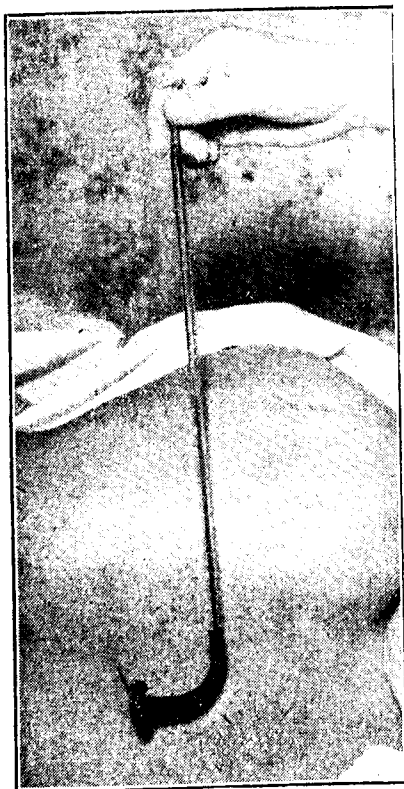


FIG. 3.—Taking the pressure.

the same course twice. Rarely it may be advisable to try an insertion slightly lateral, or in a space above or below, after suitable analgesia.

Pressure Readings

As soon as a free flow of fluid is obtained the manometer should be attached to the needle and the tap turned so that the fluid passes up the tube held vertically (Fig. 3). The patient may be told to relax his tension slightly but not to move his back. The initial pressure may now be read. A slight oscillating rise and fall is normally seen. This variation is due to cardio-respiratory effects. If, with the patient relaxed, the pressure is over 200 mm. of fluid the tap should

be turned further so that the manometer fluid escapes into the specimen bottle, but no further C.S.F. is withdrawn from the theca. The needle should be removed.

Queckenstedt's test consists of compression and release of the jugular veins, first unilaterally and then bilaterally. The operator must be sure that he does not get false-positive results from local obstruction by nerve roots. Normally, such compression causes a brisk rise of pressure up to 300 mm., bilateral compression naturally causing a more rapid effect than unilateral. Release is accompanied by a fall in pressure. In cases of obstruction to the C.S.F. circulation, rise and fall in pressure may be slow or absent. In cases of lateral sinus or jugular thrombosis, compression of the jugular vein on the diseased side causes no change; compression on the healthy side alone causes pressure changes equal to those to be expected from bilateral pressure in a normal subject.

When pressure tests have been completed, one or more specimens are collected in sterile bottles. If the outside of the bottle is not sterile, it should be unstoppered by the assistant and held below the needle butt to catch the fluid, without touching the needle. For routine examination 5 ml. should be taken. If extensive tests are to be carried out a larger specimen should be bottled.

With the needle still in position, injection of any necessary substance may be carried out, using the 10-ml. syringe. No active agent such as streptomycin should be injected all at once. C.S.F. should be aspirated into the syringe to dilute the injection material. A number of to-and-fro movements of the piston ensure adequate dilution. If air is being injected, a good fit of syringe to needle is essential, if escape is to be avoided.

Pressing the skin firmly through a swab with the left hand, the operator smoothly and swiftly withdraws the needle. If any bleeding is seen the flow should be stopped by firm pressure. No further attention to the site is necessary. (Some like to apply a small dressing, but this often causes slight irritation and inflammation.)

The patient should be informed of the success of the proceeding and allowed to return to a normal position in bed.

The specimens, labelled, dated, and numbered, should be sent for analysis at once.

Aftercare and Complications

To avoid trouble a nursing routine for all cases is advisable. The patient is allowed only one pillow, and stays in bed till the following day. Plenty of fluid should be taken. The following complications may be encountered:

(1) **Headache** is uncommon: it is usually slight and transient. More severe headache in the absence of obvious disease suggests a leakage of C.S.F. through the site of puncture and low intracranial tension. Saline fluids, flavoured with lemonade, are helpful. The foot of the bed should be put on blocks. Analgesics are to be used.

(2) **Backache** at the site of puncture is occasionally noted. The site should be inspected for signs of infection in the skin or muscles.

(3) **Fever** up to 100° F. (37.8° C.) may be seen on one reading in the 24 hours after puncture. It generally subsides without treatment.

The above symptoms very rarely indicate the disaster of meningitis due to septic puncture. Careful watch should always be kept for the possibility. If there is infection it must be admitted so that treatment can be started at once. There may be medico-legal consequences.

(4) Injected solutions too strong for the nervous system may cause *convulsions* or *local cord damage*. *Hopeless paraplegia* may result.

(5) **Ruptured intervertebral disk** may follow too deep a puncture, especially if repeated.

(6) **Subdural haematoma** has been reported after lumbar puncture.

(7) **Collapse and death** may occur during puncture or within 12 hours if the patient's state of disease is advanced (see contraindications).

Lumbar Puncture in Children

Commonsense modification of the above methods is necessary for carrying out lumbar puncture in children. Pre-operative sedation is often of value. An uncooperative child will need to be firmly and expertly held in the fully flexed position by a trained person at the opposite side of the bed. It is best to put one arm round the patient's neck and the other under his knees. The spinal theca is closer to the skin and may, in an emergency, be reached with a suitable hypodermic needle. A needle of finer gauge than is used for adults should be used, especially if pressure readings are not essential. The Harris or Howard Jones pattern is pleasant to use.

Next article on Clinical Pathology.—"Taking Swabs," by Dr. Robert Cruickshank.

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

WASHINGTON SYMPOSIUM ON ANTIBIOTICS

[BY A SPECIAL CORRESPONDENT]

A symposium on antibiotics, intended to be the first of an annual series, and sponsored by the Antibiotics Division, Food and Drug Administration, U.S. Department of Health, and by the journal *Antibiotics and Chemotherapy*, was held in Washington on October 28 to 30 in the magnificent auditorium of the Department of Health. Introductory addresses were given by HENRY WELCH, director of the Division of Antibiotics, CHESTER S. KEEFER, now special assistant to the Secretary for Health and Medical Affairs, and by F. MARTI-IBANEZ, international editor of *Antibiotics and Chemotherapy*, who paid a tribute to the pharmaceutical manufacturers, among whom free competition had been the spur responsible for rapid progress. In discussing the impact of antibiotics on medicine, and the profound change resulting in the natural history of disease, he suggested that chairs of chemotherapy should be created in medical schools throughout the world in order that the subject might be more adequately studied. (It may have occurred to other hearers that many distinguished physicians in the U.S.A. are working very much as if they held such chairs without the trouble of their creation or the restrictions which this would imply.)

The number of papers read during the three days of the symposium was 102, many being contributed by well-known authorities, and together they must fairly represent the latest acquisitions of knowledge and trends of opinion in a country which has advantages over all others in this sphere. The following is some account of what was said on the more important topics.

Misuse of Antibiotics

There seemed to be universal agreement that antibiotics were being grossly misused. PERRIN H. LONG (New York) picturesquely described the American populace as "an enormous sponge with an infinite capacity for absorbing antibiotics." MAXWELL FINLAND (Boston) referred dis-

approvingly to the common practice of administering many drugs successively or together for no more precise indication than fever, and blamed advertising pressure for some of this. SIDNEY ROSS (Washington) described the profession as being "inundated literally with a plethora of drugs," and made a plea for a return, for many purposes, to an earlier, simpler, cheaper, and often no less effective treatment; he asked his hearers not to "write off an obituary of sulpha drugs in the current high-power antibiotic era."

Acquired Bacterial Resistance

A great deal of such need as there is for new antibiotics is due to the waning power of their predecessors, which is a result of the acquired resistance of bacteria to them. As Finland pointed out, penicillin is fortunately unique in its exemption from this defect. The only possible instance, in his opinion, of a general diminution in sensitivity to this drug might be seen in the larger doses required to cure subacute bacterial endocarditis, owing, on this hypothesis, to the effect of ten years' use on the world's salivary streptococci.

It is true that penicillin resistance in staphylococci is now common and disastrous, but this is not the result of acquired resistance. To almost all other antibiotics all susceptible bacteria tend to become resistant and to remain so. Several speakers gave recent figures for the proportion of strains of common organisms found resistant to the principal antibiotics in use: these figures differed little from others recently published. The most disturbing change is evidently a pronounced increase, said by Ross to have been sharply accentuated recently, in the proportion of strains of staphylococci resistant to aureomycin and terramycin (one figure given for this proportion was 40%). An opinion expressed by several speakers was that the danger occasioned by these changes had been exaggerated. HARRY DOWLING (Chicago) took comfort from observations which were said to show that exposure to another antibiotic, or cultivation with a sensitive organism of another species, might render a resistant organism sensitive again: he cited an instance in which the substitution of another antibiotic in a hospital for one to which a high proportion of strains of an organism had become resistant was followed by a fall in this proportion. WALSH McDERMOTT (New York) believed that this problem was important only in connexion with tuberculosis, urinary infections, and infections by staphylococci, and that tissue destruction and the consequently greater difficulty of eliminating the organism was a factor. He also regarded the problem as a "hard core remaining unsolved" rather than as a threatening catastrophe, and believed that it was not one which could in any case be solved by drugs alone.

Combined Therapy

Although, as Dowling said, rapid elimination of the organism is the only certain way of preventing acquired resistance, combined therapy with two or more drugs may delay or minimize it: such treatment may also be indicated for the sake of a synergic effect, or contraindicated because of an antagonistic effect. ERNEST JAWETZ (San Francisco) gave an account of the conditions under which such effects might be expected, as defined largely by his own work, and GLADYS L. HOBBS (Brooklyn) described an extensive series of experiments on combined action *in vitro* which seemed to illustrate the difficulty of laying down any general rules in this connexion. Among combinations recommended for clinical use were the triple combination of penicillin, chloramphenicol, and a sulphonamide for pyogenic meningitis (another author being cited as having lost only 7 out of 80 cases on this treatment), erythromycin and streptomycin for coccal endocarditis (referred to later in connexion with the former drug), and polymyxin with terramycin for *Ps. pyocyanea* infections (this suggestion was based only on an *in vitro* demonstration of synergism, and another speaker had failed to confirm this finding).

Mode of Action

In an essentially practical and mainly clinical meeting few papers dealt with pure theory or fundamentals, but two outstanding exceptions must be mentioned. HARRY EAGLE (Bethesda) reported studies with radio-penicillin which showed that the amount of penicillin bound by the bacterial cell was closely correlated with its sensitivity: sensitive cells concentrated the drug within themselves, the amount bound varying little with the concentration of the solution used. Since the effect was the same whether the radioactive element was C or S, and these were far apart in the penicillin molecule, the probability was that the entire molecule is bound and not some part of it. He also showed that extracts of sensitive cells bound more penicillin than those of insensitive cells, a finding which suggested that sensitivity might depend on the reactivity with penicillin of certain cell constituents, possibly enzyme proteins. On the other hand, combining power was unchanged in cells rendered artificially resistant. Another suggestive observation was that extracts of mammalian cells had little combining power: the possible connexion with low toxicity was evident. From the same institution came a report by ARTHUR K. SAZ and RITA B. SLIE on interference by aureomycin with the reduction of the nitro groups of chloramphenicol and *p*-nitrobenzoate to the corresponding arylamines by cell-free extracts of *E. coli*—the first example of such an effect which has been described.

New Antibiotics

ERYTHROMYCIN AND CARBOMYCIN

Of these two recent and very similar antibiotics, the former appears to be the more active and has been subjected to more extensive clinical trial. EMITT H. SHOEMAKER and ELLARD M. YOW (Houston, Texas), employing a daily total dose of 20–25 mg./kg. body weight, had obtained almost uniform success with it in pneumonia and haemolytic streptococcal infections, but less regularly successful results in staphylococcal infections. They explained both their failures and the failure of the organism to develop resistance to the drug in terms of non-penetration into such lesions as empyema and osteomyelitis. From the same institution LLOYD C. JONES and ELLARD M. YOW reported on the treatment of bacterial endocarditis resistant to other therapy: erythromycin alone had only a temporary suppressive effect, but given in combination with streptomycin it achieved cure in 5 out of 7 cases—one caused by a staphylococcus, the remainder by various streptococci. In 1 patient with a streptomycin-resistant infection treatment with erythromycin and bacitracin was successful. W. M. M. KIRBY (Seattle) referred to 100 cases of pneumonia, 12 having positive blood cultures, in which the response to erythromycin was uniformly good and the blood levels attained higher than those with similar antibiotics. Jawetz protested against the trial of a new antibiotic in "a disease in which any hard evil look will eradicate the organism" (gonorrhoea was referred to, but it is a testimony to the achievements of chemotherapy that this picturesque expression could be intelligibly used in reference to any disease).

A somewhat discordant note was struck by M. H. LEPPER and his colleagues (Chicago), who observed that, within one month of the adoption of erythromycin for general use in a hospital, strains of staphylococci resistant to it began to appear in the nose and throat of the staff: after five months the carrier-rate of highly resistant strains reached 75%. The use of the drug was then discontinued, and the carrier-rate fell to 37% two months later. These resistant organisms were also recovered from the trachea of patients tracheotomized for poliomyelitis. The obvious moral was that the use of erythromycin should be restricted to patients for whom no other treatment was available, which was equivalent to saying those with staphylococcal infections resistant to all earlier antibiotics.

TETRACYCLINE

This was the surprise of the meeting, and calls for some preliminary explanation. It is now known that the molecular structures of aureomycin (chlortetracycline) and terramycin (oxytetracycline) differ only in the possession of a chlorine atom by the former and an OH group by the latter, and the new antibiotic is simply the same molecule without either of these attachments. Descriptions of its properties were given by members of the research staffs of the manufacturers of both chlortetracycline (Lederle Laboratories) and oxytetracycline (Chas. Pfizer and Co.), and of the staff of the Heyden Chemical Corporation, who have isolated a *Streptomyces* from a Texas soil which directly forms tetracycline itself. Its preparation from chlortetracycline was described by J. H. BOOTH and others (Lederle Laboratories), dehalogenation being achieved by treatment with palladium on charcoal in the presence of hydrogen: the company proposes to name the new drug "Achromycin."

It appears, as might perhaps be expected, that there are only minor differences between the activity of tetracycline and that of its two near relatives, either *in vitro* or in the experimental animal. It is much more stable than chlortetracycline and has a rather lower acute toxicity. Satisfactory blood levels are attained, and penetration of the blood-brain barrier is good: it has also been shown to appear in cord blood, saliva, and serous effusions. It was claimed that resistance to it develops more slowly than either of the others, and that it does not stimulate the growth of *Candida*, as chlortetracycline is said to. Proof of its lack of toxicity is fully adequate, and Finland reported having used it in 102 patients with streptococcal, pneumococcal, staphylococcal, and urinary infections with good results.

The main claim of tetracycline to superiority depends almost entirely on its lesser liability to cause gastro-intestinal disturbance. Figures cited by several speakers indicated a substantially lower incidence of nausea, vomiting, and diarrhoea than that produced by either of its predecessors.

Search for New Antibiotics

Something was heard of the present extensive search for antibiotics active against the smaller viruses, but it does not seem that this has yet been rewarded by any discovery of immediate therapeutic importance. There were papers on fumagillin, which is highly active against *Entamoeba histolytica*, and on nystatin, which is antifungal. Among other named antibiotics, hygromycin and streptogramin are broad-spectrum antibacterial substances of some promise; ruticin and streptocardin seem unpromising; and puromycin has been shown to have a retarding effect on the growth of certain tumours.

Treatment of Individual Diseases

Tuberculosis.—WILLIAM B. TUCKER (Minneapolis) reported a study of the chemotherapy of tuberculosis, an interesting finding in which was that, when P.A.S. was combined with isoniazid, not only were clinical results almost as good as with isoniazid and streptomycin, but resistance to isoniazid developed less than with the other combination. In patients intolerant of P.A.S. terramycin had been given with streptomycin, and acted like P.A.S. in preventing streptomycin resistance. Viomycin given in 2-g. doses twice weekly together with daily P.A.S. had been found useful in streptomycin-resistant cases.

Syphilis.—M. J. ROMANSKY (Washington) had treated 62 patients in various stages of syphilis with aureomycin with satisfactory results, and presented less extensive evidence that, if it were necessary, this disease could probably be treated with any of the other similar antibiotics. CHARLES R. REIN (New York) emphasized the facility with which syphilis could now be treated with penicillin, a single dose of a long-acting preparation being adequate in the early stages. The latest product contained potassium penicillin, procaine penicillin, and dibenzylethylenediamine dipeni-

cillin, giving a slowly falling gradient of blood concentration lasting over a long period (one patient had a detectable blood concentration 66 days after the last of multiple doses).

Peritonitis.—It is notorious that owing to the difficulty of carrying out satisfactory comparative trials little information exists about the relative merits of different forms of chemotherapy in peritonitis. EDWIN J. PULASKI (Washington) had tried to remedy this deficiency so far as possible by experiment. Peritonitis was produced in rats and dogs by perforating the caecum and at the same time introducing mucin into the peritoneum. The results in both species pointed clearly to the superiority of penicillin with streptomycin over either chlortetracycline or oxytetracycline. To achieve 90% recovery (no treatment saved all the animals) these drugs had to be given both intravenously and intraperitoneally.

Toxic Effects of Antibiotics

In a paper on sensitivity reactions PERRIN H. LONG pointed out that penicillin is the only antibiotic to which reactions have been known to be fatal, and although there was some disagreement about the frequency of this effect a natural reluctance to report it may well have obscured the occurrence of considerable numbers of such cases. Patients exhibiting these alarming reactions, fatal or not, had always had penicillin before and often previous reactions to it, suffered from asthma or some other allergic condition, and were sometimes sensitive to procaine. Inquiry about these predisposing factors should serve to identify patients in whom reactions were to be expected.

There is evidently no general agreement about the extent to which the use of bacitracin is justified despite its renal toxicity, and conflicting views were expressed on the maximal safe intrathecal dose of polymyxin.

Miscellaneous

A number of speakers read papers on antibiotic supplements in animal feeds. It does not seem that the mechanism by which these promote growth is yet fully understood. A process known as "bacillation" was demonstrated by colour film: this consists of implanting a pellet of bacitracin subcutaneously in young pigs with a syringe-like instrument (the "bacillator"). The good effect of this on survival and weight gain presumably results simply from suppressing infection and not on any hitherto imperfectly understood effect on the bowel flora. Another new development described is the use of antibiotics for prolonging the "shelf life" of perishable foods. Finally, the strange phenomenon of antibiotic dependence in bacteria is being turned to account. MORTON REITMAN and WARREN P. IVERSON (Camp Detrick) have obtained a dihydrostreptomycin-dependent variant of *Salm. typhi*, and used it as a living vaccine: this is non-pathogenic in animals and protects against subsequent inoculation with a lethal dose of normal culture in mice.

The International Sanitary Regulations governing trade and travel are now in force in 136 countries. Eight other countries have accepted the regulations with reservations, on certain articles. Only 9 countries are not bound by this international pact, and 34 others have as yet taken no definite stand. The W.H.O. Committee on International Quarantine, now holding a 3-week session in Geneva, under the chairmanship of Dr. M. T. Morgan, Medical Officer of Health to the Port of London, has been reviewing the working of the new regulations since they came into force on October 1, 1952. The regulations replaced 13 different international sanitary conventions, which were simultaneously in force. Adoption of the regulations marked the culmination of a century of effort begun in 1851 in Paris at an international conference, which attempted to establish on an international level an agreement to limit the spread of pestilential diseases such as plague, cholera, and smallpox.

IMMUNIZATION IN YOUNG CHILDREN

CONFERENCE AT WHITTINGTON HOSPITAL

A conference on immunization in young children was held at the Highgate Wing of Whittington Hospital, London, on October 31, the chair being taken by Dr. J. A. Scott, medical officer of health to the London County Council. The first speaker was Dr. W. C. COCKBURN, of the Central Public Health Laboratory. He said that no antigen was entirely free from risk, and clinic medical officers and general practitioners should always be on the watch for remote, untoward sequelae, even when using antigens which were considered safe. Geffen's findings on cases of poliomyelitis apparently associated with injections of mixed alum-precipitated antigens were an example of the value of careful observation.

The available prophylactics in England and Wales were sheep lymph for smallpox, diphtheria toxoids, and pertussis vaccines. Children should be vaccinated against smallpox in the first year of life, when the risk of encephalomyelitis was lowest and when generalized vaccinia seemed less common. Lymph should be used as soon as it was received and should be administered by the multiple-pressure method.

Diphtheria and Pertussis Immunization

For diphtheria immunization, A.P.T. in two spaced doses gave excellent results, but for children over 10 years of age, who should also have Schick tests first, T.A.F. was safer. No community could be considered adequately protected unless 70% of the population in the 1–15 age group was immunized and reimmunized at four- to five-year intervals. Most of the statistics in diphtheria immunization gave a false picture of the adequacy of immunization at present.

Good pertussis vaccine gave good protection for at least two and a half years, but no adequate standardization of vaccines was yet possible. The United States of America had accepted an intracerebral mouse test for standardization, and this test was being exhaustively tried out here. Three doses of a plain-suspension vaccine should be used for primary vaccination against pertussis. There was insufficient evidence about the need for reinforcing doses, though many medical officers of health gave a reinforcing dose at 3–5 years of age. Pertussis vaccination should be offered only to children who were fit and well at the time and who had no history of convulsions, epilepsy, or encephalitis. A mixture of diphtheria and pertussis antigens reduced the number of injections and did not appear to interfere with the potency of the diphtheria components. The effect on the pertussis component could be studied only in field trials, and such a trial was in progress in Battersea and Wandsworth.

There was no need to immunize children against diphtheria below 8–12 months of age, for in 1952 only three cases were in children under the age of 1. In pertussis there was a case for early immunization, but the effectiveness of the response of very young babies and the duration of the immunity were not yet known. Vaccination of children over 6 months of age would screen the very young baby from infection. Provided tetanus toxoid did not interfere with the potency of the pertussis component of a mixed vaccine, there was no reason why it should not be added, but it was necessary to ensure that reinforcing doses were given at about five-yearly intervals. Some method of indicating to a busy casualty officer or general practitioner whether an injured patient had been adequately immunized was required.

Administration of an Immunization Scheme

Dr. S. KING, divisional medical officer to division 4 of the London County Council, described the arrangements which were made for immunization in his area. Under Section 26 of the National Health Service Act, 1946, practitioners were encouraged to undertake vaccination and immunization, and the local health authority also did this work in welfare centres and schools. Whooping-cough vaccination was

available at the clinics, but in the absence of an authoritative statement on the effectiveness of available vaccines this procedure was not urged, as was the case with vaccination and immunization.

In Dr. King's division all notified births were entered in a register, a page being allotted to each day. Entries relating to children who died or moved from the area were deleted, and children moving in were added. As records of vaccinations and immunizations were received entries were made against the children's names. Invitations to parents to get their children protected could therefore be directed to the right people at the appropriate time—that is, for vaccination when the child reached 3–4 months, and for diphtheria immunization at 7–8 months—and health visitors were given lists of defaulters for follow-up until definite refusal was established. The schools were visited in turn, and lists were made of children needing immunization or boosting. Parental consent having been obtained, immunization sessions were held in the schools, or, if less than 20 children required injections, these were done at the end of a medical inspection.

Dr. King suggested that the suspension of whooping-cough vaccination and "soft-peddling" on diphtheria immunization when poliomyelitis was prevalent were unsettling. He asked whether it would not be better to have a "close season," say from June to October, and avoid cessation of injections, sometimes in the middle of a course.

B.C.G. Vaccination

Dr. T. M. POLLOCK, of the Tuberculosis Research Unit of the Medical Research Council, spoke about B.C.G. vaccination. Although B.C.G. had been used for over 30 years, and many millions of people had been vaccinated, controversy about its value still persisted. This was partly due to the fact that tuberculosis morbidity rates were subject to a large number of influences which were difficult to assess independently, and also because the death rate from tuberculosis had been falling for some years in many countries, irrespective of whether the vaccine had been widely used or not. Trials of the vaccine so far carried out, although criticized on statistical grounds, suggested that it was of value to those in contact with the disease, and also in communities with a high tuberculosis morbidity rate and a low standard of living. Further knowledge of the value of its widespread application in communities with a high standard of living and a moderate or low tuberculosis rate was required. It was hoped that the current trial of the vaccine being carried out by the Medical Research Council would produce such evidence, particularly about the degree of protection and length of time it lasted.

Immunization during Poliomyelitis Epidemics

In the discussion which followed the opening papers several speakers questioned the necessity of stopping injections during the poliomyelitis season, although most medical officers of health had succumbed to the general pressure. Dr. HARDING felt that if injections could be given at more than three-monthly intervals this would obviate the need for interruption. Dr. BUTLER had found that infants of 4–5 months had good antibody response, at least with the suspended vaccine, and that combined antigens gave as good response as separate antigens. Dr. THOMPSON pointed out that the greatest difficulty in general immunization of the very young infant was administrative. He also reminded the audience that severe diphtheria was still liable to occur when the general level of immunity was low, and quoted a recent example from the Midlands. In such instances even immunized children might get diphtheria, although the disease was milder in these children. Dr. BATTEN wondered whether it was worth giving a booster whooping-cough injection at 5 or 10 years. He felt it would be better to let children of this age catch the disease. Dr. POWELL said that continuous propaganda was necessary, and asked for the family doctors to take an active part in immunization and in the campaign.

In reply, Dr. COCKBURN agreed that injections should not be suspended except when a local epidemic of poliomyelitis occurred. Current surveys would reveal the size of this problem and indicate which antigen was most responsible. He felt that prolonging the space between injections to three months or more was less valuable than shorter intervals. As far as immunization of very young infants was concerned, there was some doubt about the antibody response at this age. If immunization of older children was complete the youngest would be screened from contact with the disease. He looked forward to as complete elimination of whooping-cough as of diphtheria once an antigen of measurable potency was easily producible.

Correspondence

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

Carcinoma of the Female Breast

SIR,—There is obviously nothing sacrosanct about surgery in the treatment of carcinoma of the breast, and surgeons must be prepared to consider judiciously any criticisms either of the indications for surgery or of technique.

In recent years surgery has been criticized from two opposing points of view: the first that the misleading term "radical mastectomy" is too radical; the second that it is not radical enough. On the one hand, it has been argued that routine sacrifice of the pectoralis major or surgical dissection of the axilla is unnecessary; on the other hand, that it is illogical to confine surgical attention to one route of lymphatic spread—the axillary—to the neglect of another possibly almost as important—the internal mammary.

But the advocates of these views too must be prepared to submit them to critical examination, and it is in this spirit that I would like to raise a few questions on the interesting article of Dr. I. G. Williams, Mr. R. S. Murley and Mr. M. P. Curwen (*Journal*, October 10, p. 787). The essence of their case is that removal of axillary glands is unnecessary or undesirable and should be replaced by radiotherapy, limiting surgery to removal of the breast. Now a considerable amount of histological material is available on the effect of irradiation of invaded axillary glands. Surgeons are frequently clearing axillae after they have been submitted to full courses of irradiation, and it is striking how often the glands still contain apparently viable growth histologically in spite of the irradiation. This difficulty of sterilizing the axilla by irradiation is a common experience of those who have studied the question with histological control, and it was one of the points that emerged in an informal conference on carcinoma of the breast in London a few years ago. Have Dr. Williams and his colleagues any evidence that their experience is different or is failure to sterilize the axilla unimportant?

Anatomical and surgical details do not fall within the scope of the article by Dr. Williams and his colleagues, but are pertinent to the argument. The pectoral axillary glands are in such close relation with the axillary tail of the breast that removal of the one usually means removal of the other. Moreover, removal of a primary in the upper and outer quadrant often involves such impingement of invaded pectoral glands that even advocates of avoidance of axillary surgery advise their removal with the breast. practice, therefore, the question that has been posed, grant that the whole breast should be removed, is not whether axillary glands should be treated surgically or by radiotherapy, but whether the treatment should be complete axillary dissection or limited axillary dissection with radiotherapy.

Dr. Williams and his colleagues briefly refer to the spread of carcinoma by the internal mammary lymphatic route

a route largely ignored by both surgeons and radiotherapists until the work of Handley and Thackray. They appear to assume that irradiation of the internal mammary chain is efficient, and surgical attack unjustified. Have they any evidence of the efficiency of irradiation, or, in the case of these glands too, is the presence of apparently viable carcinoma after irradiation of no significance? It is obvious that if irradiation can deal efficiently with the invaded mammary chain it is preferable to surgery. But is it justifiable to condemn out of hand a trial of surgical methods without such evidence? At the very least, surgery has a place in the histological control of irradiation treatment. And, if surgery were as successful in dealing with the local disease in the internal mammary chain as it is in dealing with the local disease in the axilla, can we yet say for certain that this would have no influence on the course of the disease? Incidentally, Dr. Williams and his colleagues perhaps underestimate the extent of interest in the development of methods of surgical attack on the internal mammary chain. Apart from work in the United States to which they refer, it has for some time been the subject of wide inquiry and experiment, particularly in France and Scandinavia, and is also being explored in this country.

Finally, Dr. Williams and his colleagues note that in the procedures they advocate the "local recurrence index" is higher, but they do not appear to attach much importance to this. It may be that when general methods of control of malignant disease become more efficient the question of sterilization of its local manifestations will become unimportant. But at the present time, and with the bulk of the evidence suggesting that both surgery and irradiation are purely local in their effect, is not local persistence or recurrence of the disease the fairest test of the efficacy of such local forms of treatment?—I am, etc.,

London, W.1.

DAVID PATEY.

Cough Syncope

SIR,—The use of some neutral and descriptive term such as "cough syncope" in place of "laryngeal epilepsy" is to be welcomed; and all those interested in this syndrome are indebted to Professor E. P. Sharpey-Schafer (*Journal*, October 17, p. 860) for demonstrating so clearly a physiological mechanism for its production. However, in implying that this explains all cases of loss of consciousness or fits following coughing, he claims too much. There are cases in the literature, and within my own experience, where the preceding cough was neither violent nor prolonged. In some it was subjectively different from the patient's "ordinary" cough and was recognized as heralding an attack. These cases should probably be regarded as primarily epileptic with coughing as an aura.

His further far-reaching statement that a "fit can occur in any normal subject if the blood flow to the brain is sufficiently reduced" may be true. However, some procedures, such as venepuncture, used to reduce cerebral blood flow experimentally, will also affect cerebral mechanisms directly via more than one sensory pathway. The range of sensory stimuli which may on occasion produce reflex epilepsy is wide; and the evidence for some cerebral abnormality in these cases is considerable. If such stimuli occur together with reduced blood flow, and a fit ensues, it seems arbitrary to assign the role of "cause" to the vascular change, and to assume cerebral normality.—I am, etc.,

Oxford.

C. W. M. WHITTY.

Milk and Protozoal Infections

SIR,—We have read with great interest the communication on the effect of various diets on *Trypanosoma congolense* infections by Miss Audrey A. N. Keppie (*Journal*, October 17, p. 853), and we should like to add some details to the general story of milk and protozoal infections. We had not intended to publish the results below, but we feel now that the bare facts should be made known in order to prevent duplication of effort.

We have found that a pure milk diet has no suppressive activity against *T. rhodesiense* infections in rats when milk is offered three days before infection until death. The *T. rhodesiense* infestation was in fact somewhat more intense in milk-fed rats than in control normal diet-fed rats. This variance from the results obtained with *T. congolense* may be due to the swift multiplication of the human parasite in rats when compared with the more chronic strain of *T. congolense* used by Miss Keppie. The same diet effectively controlled normal and pyrimethamine-resistant strains of *P. berghei* under the same conditions.

Further, we have found that a diet of 2% casein hydrolysate in 50% glucose solution effectively suppresses *P. berghei* malaria in mice when offered in the same manner as milk. However, the effect is not so abrupt as with pure milk diets. Multiplication is permitted for six days before suppression becomes effective, but, once active, the diet reduces the parasites to negligible numbers. This is in contrast to the immediate results obtained with milk diets. The effect of casein hydrolysate diet is partially reversed by addition of *p*-amino-benzoic acid and almost completely reversed by addition of a mixture of most of the B vitamins.

May we say in conclusion that on examining all the facts we are not convinced that the inhibition of protozoal infections by milk or milk products is due wholly to a lack of any essential metabolite or of *p*-amino-benzoic acid in particular? The activity of milk as a whole is greater than such of its parts as have been tested in malarial infections, and the reversal of the effect by the addition of *p*-amino-benzoic acid is not always complete. We feel that this question is likely to be much more complex than at first it may seem.—We are, etc.,

M. A. REFAAT.
R. S. BRAY.

London, W.C.1.

SIR,—I was very interested to read the communication of Miss Audrey A. N. Keppie (*Journal*, October 17, p. 853) concerning the effect of various diets on *T. congolense* infections in mice. You may be interested to learn that we have unfortunately failed to observe any such suppressive effect of a milk diet on *T. rhodesiense* infections in mice. On the contrary, we have found that animals placed on an exclusive diet of milk for a week before infection, and subsequently left on the diet, die at about the same time and with the same degree of blood infection as do animals on the ordinary laboratory diet of cubes and water. Moreover, parasites appear in the blood on the same day after infection in both groups.

So far, in fact, we have not been able to demonstrate any effect of milk on parasites other than those of malaria. For instance, whereas a milk diet gives rise to suppression of *P. berghei*, *P. cynomolgi*, and *P. knowlesi*, it has no effect on *Babesia canis* in puppies, although the latter exists within the erythrocytes.

Recent experiments have led us to believe that the suppressive effect of milk on malaria parasites may be a good deal more complicated than has been suggested. We have, for instance, noted that at about this time of the year or a little earlier the local milk may fail completely to protect rats against a strain of *P. berghei* which on other occasions has proved to be highly sensitive. It may be that this represents some change in the cow's diet reflected in the milk and arising possibly from change in pasture.

When we first reported the suppressive effect of milk in *P. berghei* malaria¹ we suggested that a similar phenomenon might explain the commonly reported low incidence of malaria in very young (breast-fed) infants. Since the publication of our paper I have been informed that in certain areas of Africa infection of breast-fed infants is sometimes quite common. Perhaps this may also be a reflection of the mother's diet at the time of breast-feeding. It would be possible to explain this variation in the suppressive power of milk in terms of variation in the amount of some essential factor such as *p*-aminobenzoic acid, but it seems to me too early on the evidence available to interpret the action of milk exclusively in terms of deficiency of *p*-aminobenzoic acid or any other metabolites. We have broadly confirmed

the action of *p*-aminobenzoic acid on milk-suppressed berghel² and knowlesi infections, but the effect is not always complete. Moreover, we have now some evidence that other substances besides *p*-aminobenzoic acid may at times have similar effects on milk-suppressed malaria.—I am, etc.,

Liverpool, 3.

B. G. MAEGRAITH.

REFERENCES

- ¹ Maegraith, B. G., Deegan, T., and Jones, E. S. (1952). *British Medical Journal*, 2, 1382.
² Hawking, F. (1953). *Ibid.*, 1, 1201.

"Smog"

SIR,—The recommendation of the London Local Medical Committee to wear gauze masks during a fog may not be acted on by many people, but it seems likely that a loose plug of cotton-wool in each nostril would act fairly efficiently provided there is no mouth breathing. While possibly neither efficient nor advisable in young children, the value of this method can be tested by anyone using it in their coal cellars for a time and then examining the plugs, when the coal dust will be found limited to the outer parts. If a cleaner test is preferred an attempt may be made to inhale snuff—or even pepper—through them.—I am, etc.,

Ferndown, Dorset.

W. MCNAUGHTAN.

SIR,—Apropos the recent minor conflict between the London Local Medical Committee and the Ministry of Health on the subject of the efficacy of a gauze mask as a barrier against the solid particles in "smog," the following personal experience may be of some interest.

Some few weeks ago I decided to shift a quantity of coal, which was blocking the entrance of the coal shed, to the far end of the shed. Before commencing the work I donned a mask, which was of the usual pattern used in operating theatres, in the hope that much of the coal dust would be stopped thereby. To my surprise, at the end of the operation I found that most of the coal dust was deposited on the inner surface and amazingly little on the outer.

The lesson is obvious. The mask, being tied over the bridge of the nose and under the chin, left a wide gap along the upper border through which the coal dust had been aspirated, testimony for which was provided, in this instance, by the liberal coating of coal dust along the alae nasi.

I very much doubt whether such a mask would afford any measure of protection against "smog" particles.—I am, etc.,

St. Helens, Lancs.

L. CRAWFORD.

SIR,—In connexion with the much-discussed problem of "smog," I have met with several patients who have undoubtedly been suffering from varying degrees of carbon-monoxide poisoning. They have been drivers of cars and held up in traffic jams, owing to dense fog. In view of the tragic number of deaths which occurred as a result of the "smog" last winter, every effort should be made to lessen the collection of noxious gases in a motionless atmosphere. One way of doing this would be to switch off motor engines when there is a hold-up of more than a few minutes. It is very simple to switch on again when traffic begins to move.

I personally have suffered nausea and severe headache from petrol and diesel oil fumes when in a traffic block for 20 minutes, irrespective of fog, so how much greater will be the concentration in still air?—I am, etc.,

Chigwell, Essex.

CONSTANCE P. F. THOMAS.

Clinical Pathology in General Practice

SIR,—Dr. A. J. N. Warrack's comments (*Journal*, October 24, p. 935) on my account of the facilities provided for the general practitioner by the Public Health Laboratory Service (*Journal*, October 10, p. 823) should encourage us to think a little more carefully about what we mean by a consultant service in clinical pathology.

Even in the best hospitals, I doubt whether every request for a laboratory examination is preceded or followed by a discussion of the case between the clinician and the pathologist. Occasionally, it is true, the clinician will approach the pathologist to ask for advice before planning his investigation, but such consultations arise more commonly after one or more examinations have been carried out. Indeed, in most cases no such personal consultation takes place, because the results of the laboratory tests have provided the information the clinician requires. The essential elements in the situation are that the clinician should know that he can approach the pathologist when he needs advice, and that the pathologist should seek every opportunity to tender advice when his results suggest that it is needed. There is no reason why the position of the general practitioner in relation to the laboratory should be in any way different from that of the hospital doctor. He, too, should be able to learn when to begin by consulting the pathologist and when to submit specimens first.

Dr. Warrack deplores the division of clinical bacteriology into "infectious" and non-infectious," but this is the way in which the pathological services are divided in the National Health Service. The hospital service deals essentially with the curative, the public health service with the preventive side. In practice the division seldom leads to serious trouble, and most of the apparent anomalies which Dr. Warrack instances can be settled quite easily by the heads of the laboratories concerned. Close co-operation between the two services is essential, but the form it takes must depend on local circumstances. The aim is to site the two laboratories together so that they may work under the same favourable conditions as Dr. Warrack enjoys at Sheffield.—I am, etc.,

Manchester.

M. T. PARKER.

Prolapse of the Urethra in Young Girls

SIR,—May I be permitted a brief comment on the case recorded by Mr. H. H. Fouracre Barns (*Journal*, October 3, p. 765)? I have met with several instances of this lesion over the years.

In the aetiology it should not be forgotten that a urinary infection with transient cystitis and straining may be an important factor, and in the treatment simple conservative measures, if patiently pursued, can, in my experience, prove entirely successful. They should be given an extended trial before any operative interference is resorted to. An account of this somewhat rare condition will be found in *The Urology of Childhood*.¹—I am, etc.,

Deal.

T. TWISTINGTON HIGGINS.

REFERENCE

- ¹ Higgins, T. T., et al. (1951). *The Urology of Childhood*. Butterworth, London.

The Human Foot

SIR,—It was interesting for those of us in the School Health Service to read the two articles (*Journal*, October 3, pp. 745 and 749) and the annotation (p. 772) on foot defects. Such research is perhaps useful corroboration of what is virtually self-evident when the question of shoes and feet is seriously considered. In old China binding of women's feet was accepted without question as a social convention. We still accept it here—for both sexes—admittedly in a lesser degree. It is impossible to buy ready-made shoes which fit the natural shape of the feet except in a few expensive brands for younger children. For adults such shoes do not exist. The inner border of the shoe should be straight. Almost all shoes have a curved inner border, with the result that they act as a permanent splint tending to mould the hallux into a valgus position. It is strange that this obvious fact was omitted from all three papers. It is a fact greatly disliked by the shoe trade and one which they try to conceal as much as possible. It will be time for the real research to begin when it is possible for the population to obtain

naturally shaped shoes. When this happy time comes, we may suspect that there will be little clinical material left to investigate.

The figures given of hallux valgus incidence in both papers are astonishingly low and contradict everyday experience. It is alleged that only 13.9 cases of hallux valgus per thousand were found in recruits of 17–19. My own experience in boys of 15 would be nearer 50%. In the Ealing survey the percentages in senior boys and girls were given respectively as 4% and 22.4%. My experience would indicate nearer 50% and 90% respectively. This is probably a question of standards. I submit that this acceptance of low criteria is deplorable, however much it may be welcomed by the shoe trade. Let us all press for action in this matter.—I am, etc.,

London, W.8.

GEOFFREY G. SHERRIFF.

SIR,—Although it is very clear, and all too obvious, to Mr. John Hanby (*Journal*, October 24, p. 935) with his long experience of foot troubles that the incidence is shockingly high and that very many have their origins in childhood, it is only recently that the public as a whole have begun to appreciate these facts. It is also only comparatively recently that we, as a medical profession, have made any efforts to put the problem on an epidemiological basis and have had the benefit of scientific and statistical studies such as those of Dykes *et al.*,¹ Hardy and Clapham,² and Craigmile.³

It would surely be unrealistic to approach the problem on the basis of Mr. Hanby's first suggestion, that the sole of a shoe or its equivalent leads to a lack of sensory stimuli to the small muscles of the foot and thereby causes retraction of toes, etc. Many feet that have had these restrictions have not developed these defects and it would surely be impossible to discard shoes.

On his second point—namely, the anomalies of the normal foot—as a result of the recent work we are in a much better position than ever before to realize the enormous range and variety of normal foot shapes. It is now surely clear that feet are as various as faces, and it is evident that the casing of a growing foot is no simple matter. If possible, every child's foot should have a made-to-measure shoe and this should be changed every three or four months. We have been experimenting with the possibility of shoes made from plaster casts for children—without much assistance from the boot and shoe trade—during the last year. This form of course would be the ideal solution. Alternatively, surely the least we can ask is that every child should have a proper fitting and not be subjected to a 1-in-3 chance of getting it—as at present. Until shoes are supplied on the lines of the scheme run under Dr. Doris A. Craigmile's supervision in Ealing there can be no possibility of normal foot development.—I am, etc.,

Ealing, W.5.

W. G. BOOTH.

REFERENCES

- ¹ Dykes, R. M., Grundy, F., and Lee, H. E. (1952). *Med. Offr.*, 87, 223 and 235.
² Hardy, R. H., and Clapham, J. C. R. (1952). *Lancet*, 1, 1180.
³ Craigmile, D. A. (1950). *Med. Offr.*, 83, 229.

Succinylcholine Chloride for Casualty Anaesthesia

SIR,—Drs. Terence Vaz and J. M. Bishop have proposed (*Journal*, October 17, p. 885) the use of intravenous succinylcholine chloride "as a simple and effective method of obtaining relaxation during manipulations in the casualty department."

Such manipulations may be required in two classes of patients—those who are requested to attend at a stated time, having been instructed to take no food, and emergencies who come in "off the street." In such cases anaesthesia will presumably be postponed for 3–4 hours after the last meal. The stomach is then presumed to be empty. It is not uncommon, however, for this belief to be unfounded. While vomiting is regrettable in association with a simple

gas-and-oxygen anaesthetic, it is seldom disastrous, as the protective reflexes are seldom far away. How different is the situation if succinylcholine chloride is given also.

I suggest, Sir, that it should be made clear that the technique suggested by Drs. Vaz and Bishop is indefensible in emergency cases, although admirable for "arranged" cases.—I am, etc.,

Glasgow.

R. CECIL BROWN.

SIR,—In their letter (*Journal*, October 17, p. 885) suggesting the use of succinylcholine chloride for casualty anaesthesia, Drs. Terence Vaz and J. M. Bishop do not mention how their patients are prepared pre-operatively. If this technique is used on emergency cases for the reduction of fractures, then this is an important omission. Such cases have often had a recent meal, and mental and physical shock may have delayed the emptying time of the stomach. Morton and Wylie¹ have described how, in these conditions, regurgitation of stomach contents is likely to accompany the injection of thiopentone or relaxant drugs. If the use of muscle-relaxants in casualty departments is to be advocated, then this danger must be stressed, for it is often with the more trivial accident cases that the greatest care must be taken. If it is certain or even probable that there is material in the stomach, then the anaesthetist must postpone operation for not less than five hours, or wash out and empty the stomach before inducing anaesthesia. Drs. Vaz and Bishop say that the patient may safely go home after the technique described, but I am sure that, if this is so, then it must be a rule that he is neither unaccompanied nor in charge of transport.

Whilst these observations are obvious, they must be emphasized continually if this trend in casualty anaesthesia develops.—I am, etc.,

London, E.C.1.

ROBERT I. W. BALLANTINE.

REFERENCE

- ¹ *Anaesthesia*, 1951, 6, 190.

The Diploma in Public Health

SIR,—I read with considerable interest Dr. Max Park's letter (*Journal*, October 3, p. 778) in which he discusses the present course for the Diploma in Public Health. Although some of his criticisms are undoubtedly of great importance in considering any revision of the course, I would like to take issue with Dr. Park on one or two points.

It must be remembered that, although current changes in public health practice in Great Britain were brought about largely as a direct result of the National Health Service, in many other parts of the world the public health physician will continue to concern himself with the communicable diseases and their treatment. Therefore a real knowledge of bacteriology, parasitology, entomology, vector control, and related subjects is most necessary for such a health officer, especially those working in tropical and sub-tropical countries. Not all the latter wish only to hold the D.T.M.&H., and others may prefer to have the D.P.H. in any case. Surely there is no reason why lectures and demonstrations on these subjects need be tedious repetitions of undergraduate material. A little imagination on the part of the instructors is all that is needed.

Presumably Great Britain still wishes to retain her position as an international teaching centre, and her universities and colleges to serve students from abroad as well as her own sons and daughters. If so, the course for the Diploma in Public Health must be so orientated. However, there is surely no reason why a wider choice of subjects should not be allowed (as is done in the American schools of public health) in addition to the basic subjects which must be taken by all candidates for the diploma. Review of the course for the diploma is excellent, and, provided any revision undertaken is carried out with reasoned conservatism, this can only be to the good. Dead wood must be chipped away if progress must be made, but make sure

that it is really dead first. Through exercise of the choice system the "local" man can choose the subjects he feels are necessary for his work in the British Isles, while the foreign or Commonwealth man can follow the broader line.—I am, etc.,

Ayer, Massachusetts.

KENNETH I. E. MACLEOD.

The Broken Acrylic Head

SIR,—We read with interest Mr. K. H. Pridie's letter (*Journal*, October 24, p. 939). Work which we have carried out on the Judet heads which have been sent following our request (*Journal*, May 2, p. 993) for broken prostheses has shown that the problems involved are far more complex than Mr. Pridie's letter would suggest. His assumption that the skirt breaks first and throws extra load on the stem is not a major consideration. The skirt is not designed to take the weight of the patient. Even if the metal rod is increased in diameter—and some makers do use large-diameter rods—breakages still occur. Moreover, it is doubtful whether, in the operative procedure, the surgeon is able to fit the prosthesis in such a manner as to obtain a pre-determined distribution of load between the skirt and the stem of the acrylic prosthesis. Reorganization of bone in the immediate post-operative period will result in redistribution of load beyond anyone's control. It can be demonstrated that a proportion of the failures of British manufactured Judet prostheses are due to lack of knowledge of the behaviour under fatigue stress conditions of polymethyl methacrylate in combination with metals. It is only since the introduction of the Judet prosthesis that metals have been used for purposes where they will be continuously exposed to fatigue stress. Very little thought has been given to the possibility of stress corrosion of metal in the human body. Static loading tests at room temperature do not demonstrate the ability of a composite structure to withstand fatigue stress at body temperature after sterilization by boiling. A study of the biomechanics of this problem seems to suggest that the angle at which the prosthesis is inserted is critical. The use of more extensive prostheses, which Mr. Pridie suggests, may prove to be a step forward in the treatment of pathological conditions of the hip-joint.

There is no doubt that plastics and metals have their place in orthopaedic surgery, provided the materials used, the design of the prosthesis, the condition of the bone to which it is attached, and the situation in which it is to operate are carefully considered. Large-animal experiments can give a great deal of valuable information and should be performed prior to the nation-wide use of new devices. The present trend of devising and modifying all manner of prostheses, coupled with the apparent lack of research facilities of those who manufacture them, will only increase the sufferings of the patient with which Mr. Pridie is so rightly concerned.—We are, etc.,

Stanmore.

London, W.C.2.

JOHN T. SCALES,
Plastics Research Unit, Institute of Orthopaedics,
J. M. ZAREK,
Faculty of Engineering, King's College.

Site for Vaccination

SIR,—For some three years past I have been vaccinating female infants on the sole of the foot in those cases where the mother, for cosmetic reasons, has requested that the upper arm should not be used. The percentage of "takes" does not appear to differ from that where vaccination is on other sites. The advantages would appear to be: (a) a concealed scar (as compared with vaccination on the thigh); (b) the vaccination site is well away from faecal and urinary contamination; and (c) the mothers inform me that the bathing of the baby is facilitated.

Whilst not for one moment claiming to be the originator of the technique, I have so far not met anyone using this site for vaccination purposes. The views of other practitioners would be much valued, with especial reference to any disadvantages of using this site for vaccination.—I am, etc.,

Faversham, Kent.

J. CANTOR.

Obituary

Sir NORWOOD EAST, M.D., F.R.C.P.

Sir Norwood East, whose death took place at his home at Crowthorne, Berkshire, on October 30, celebrated as recently as last Christmas his eightieth birthday, when he received many tributes, including one in this *Journal*, in which his noteworthy career in the prison medical service was set out.

William Norwood East was born in 1872, the son of a hotel-keeper at St. Martin's-le-Grand in the City of London. He was educated at King's College School and King's College, and received his medical training at Guy's, qualifying in 1897 and proceeding M.D. (London) in 1901. He entered the prison medical service in 1899, and served at several of the larger prisons—Portland, Manchester, Liverpool, and finally as senior medical officer at Brixton. In 1924 he was promoted medical inspector of H.M. prisons in England and Wales, and six years later was appointed H.M. Commissioner of Prisons and director of convict prisons. He retired in 1938, but returned to his task and was reappointed Prison Commissioner for seven months in 1940–1, while his successor was seconded elsewhere. After his retirement he was appointed lecturer in forensic psychiatry at the Maudsley Hospital.

In the course of a career extending over 50 years, Sir Norwood East made an outstanding contribution to the solution of the ever-debated problems of crime and punishment, the causes of crime, and the treatment of offenders. He brought to his task the precise mind of a scientist, the practical outlook of an administrator, and the balanced judgment of a lawyer. He did much to enhance the efficiency of the prison medical service and to humanize the prison hospital, while his study of criminal psychology led to a new understanding of the criminal. During his later career psychiatry became increasingly prominent in both the trial and the treatment of criminals, and East, who understood as few men did the psychiatric approach, never dismissed it as irrelevant, but on the other hand he was not prepared to support excessive claims of psychiatry in dealing with criminal cases. The lawyer's standpoint that society must be protected was fully appreciated by him.

Norwood East was at one time or another president of the Medico-Legal Society, the Society for the Study of Addiction, and the Psychiatric Section of the Royal Society of Medicine, and he was a corresponding member of various medico-legal societies abroad. He had a prolific pen. The first of his writings was in 1901, in the *Journal of Mental Science*, when he wrote of physical and moral insensibility in the criminal. His *Introduction to Forensic Psychiatry in Criminal Courts*, published in 1927, was the first work of its kind. One of his last publications was *Society and the Criminal*, a book which appeared in 1949. One of several investigations which he organized was into the cause



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of delinquency among adolescents, based on material comprising 4,000 cases. He analysed 1,000 consecutive cases of attempted suicide, and another inquiry of his was into the susceptibility of criminals to atmospheric changes.

His various important tasks included those of an inspector under the Inebriates Act and membership of the Departmental Committees on prison dietary and on persistent offenders. He was also very frequently called in as assessor to give an opinion on the sanity or otherwise of murderers after conviction.

In a service which can be sustained only by an exceptional sense of vocation because of the unresponsive and often repulsive human material with which it has to deal, he kept his own sense of vocation to the very end and continually impressed upon the young doctors who came into the service the high moral demand which such work would make upon them.

His knighthood was announced in the Birthday Honours, 1947, for services to the study of criminal psychology. Lady East, whom he married 53 years ago, survives him with one daughter, the wife of Dr. J. S. Knox, the deputy superintendent at Broadmoor.

W. E. TUCKER, M.B., F.R.C.S.

Dr. William Eldon Tucker, a leading figure in Bermuda, died at the age of 81 in the King Edward VII Memorial Hospital, Bermuda, on St. Luke's Day, October 18. His death brought to an end a life of service and great achievement, not only in his profession, which awarded him one of its highest honours, but in the field of sport and community affairs.

William Eldon Tucker, the son of the late Venerable Archdeacon George Tucker, was born on August 17, 1872. From Trinity College School, Port Hope, Canada, where he was a classical scholar and head of the school, he went on to Caius College, Cambridge, and soon won fame in the Rugby world, playing for Cambridge and England. Even in the 1920s many of the college servants still remembered his feats of strength, for he had gained the reputation, among other things, of being one of the strongest men ever to be at the University. In 1894 he captained the Cambridge



(Frederick L. Hamilton, Bermuda)

fifteen, the same year as the late G. M. Carey was captain of Oxford, and the result of that year's game was a draw. Both captains played in the England team, together with such great players as A. F. Todd, S. M. J. Woods, and Frank Mitchell, and were firm friends. Altogether Tucker played five times for England. He also played cricket and rowed for his college for four years. From Cambridge he went to St. George's Hospital and qualified in 1899. While at hospital he played rugby for Blackheath, and was in the team that won the county championship in 1897.

After holding a number of house appointments at St. George's, he graduated M.B., B.Chir. at Cambridge and returned to Bermuda to set up in general practice there. Before his arrival only two major operations

were known to have been performed in the islands. But through his efforts and those of the late Dr. D. C. Trott the time came when several hundred patients were treated each year by major surgery in the local hospital. During the first world war Tucker acted as surgeon to the Military Hospital, Bermuda, and on one occasion a ship-load of frost-bitten West Indian troops arrived from the north in winter, and he then performed about 150 amputations within a period of a month.

A practitioner of the old school, Dr. Tucker was loved and respected throughout the islands, and he rendered invaluable service to the King Edward VII Memorial Hospital as a member of the medical staff from the day it was opened. Motor-cars for general use were not permitted into Bermuda until 1947, so he visited his patients on horseback or bicycle or by horse-drawn carriage. Although he was a man of strong personality and definite views, it was largely because of a combination of gentleness and frankness that he made few enemies but many friends. In later life he became crippled with osteoarthritis of the hip-joints and arteriosclerosis of the vessels of both legs, which compelled him to give up practice in 1949. Nevertheless, he bore his disabilities with a stout heart and did not complain.

Tucker worked hard to improve the standards of the medical profession in Bermuda. He served at various times on the Board of Health, as medical attendant at the leprosarium, as chairman of the hospital advisory committee and of the medical examining board, and he was a past president of the Bermuda Branch of the British Medical Association. In April this year he flew to London to receive the Fellowship of the Royal College of Surgeons of England, conferred on him in recognition of his surgical work. It was with great pride that he received this honour, which put the seal on his full and useful life. Dr. and Mrs. Tucker celebrated their fiftieth wedding anniversary last year. His widow, two daughters, and two sons survive him. His elder son, Mr. W. E. Tucker, is an orthopaedic surgeon in London and, like his father, a former captain of the Cambridge Rugby fifteen and an old England player. In 1925 Dr. Tucker saw his son lead the Cambridge side against Oxford at Twickenham.

We are indebted to Professor R. J. WILLAN for the following appreciation: In 1938 I had a pleasant holiday in Bermuda, largely contributed to by the kindness and hospitality of Dr. and Mrs. W. E. Tucker. Perhaps few know of the responsibility Dr. Tucker shouldered during the pioneer days in the islands, before easy—and particularly rapid—travel communication was possible. The pre-early rapid—travel communication was possible, when even sea air-travel era is particularly referred to, when even sea transport was limited, and New York was 700 miles distant from Bermuda. Dr. Tucker was a good all-round surgeon and operator: countless patients—not only Bermuda residents but visitors to the islands who developed acute surgical emergencies—owed their lives and health to Dr. Tucker for his skilful diagnosis and surgical treatment. The recent award of the F.R.C.S. gave great pleasure to his many friends in Bermuda, in Great Britain, and in the American continent. His passing has left a gap in Bermuda and in the surgical world.

Dr. ARCHIBALD OGG died at his home at Wolverhampton on October 12 at the age of 60, after an illness lasting only two days. His death, which occurred shortly after his return from holiday, was a great shock to his friends and colleagues, but he died, as he hoped he would, in harness. Archibald Ogg was born on May 24, 1893, and was educated at Glasgow University, where he graduated first as M.A. in 1919 and then as M.B., B.Ch. in 1924. He took the D.P.H. in 1927 and proceeded to the M.D. in 1934.

After qualifying he held the appointments of house-physician at Glasgow Royal Infirmary and assistant physician at the Glasgow Fever Hospital, later becoming resident medical officer at the Leicester Isolation Hospital and Sanatorium. A period in private practice and at the tuberculosis dispensary at Nuneaton followed, and he was then appointed tuberculosis officer to the Staffordshire, Wolverhampton, and Dudley Joint Board for Tuberculosis. He was at first in charge of the dispensaries in the north of the county, where he rapidly won the affection and gratitude of those under his care. His interest in his patients was not limited to their physical condition; indeed, he spent much of his private time in seeking added comforts and personal necessities for them. This was before work on the care of the tuberculous was widely organized by local authorities and voluntary societies as a necessary part of their schemes. In 1941 Dr. Ogg asked to be transferred to the Wolverhampton district, where he worked without sparing himself and continued until the time of his death. The long hours of strain during the war years in the very busy clinics undermined his health and probably contributed to his relatively early death. His loss will be widely mourned, for he regarded his work as being essentially personal in nature. He belonged to the early generation of tuberculosis officers whose efforts had, of necessity, to be concentrated on the environmental conditions of the patients, and though he kept himself strictly up to date clinically this outlook aided and enhanced the value of his treatment of his patients. His type is becoming rare, but it is to be hoped that his outlook will be held by his successors. He leaves a widow, to whom our deepest sympathy is extended.

We are indebted to Dr. R. L. MACKAY for the following appreciation: Dr. Archibald Ogg was an undergraduate in arts at Glasgow University when the first world war broke out. Like so many of that generation, he abandoned his studies to serve as a private in the ranks of his local regiment, the Cameronians (Scottish Rifles). While with his battalion he was seriously wounded, lying in no-man's-land for a day and a night. His company commander tried to bring him in, but was killed in the attempt, but later his platoon sergeant, displaying the greatest bravery, succeeded, for which act he was awarded the Victoria Cross. No higher tribute to Ogg's qualities and character could have been paid in those distant days than that these sacrifices should have been made for him. Although he never spoke of his war service, Ogg's life showed that he never forgot those two men. Thereafter he was commissioned in the Machine Gun Corps, and later returned to complete his arts course in 1919 and to commence in medicine. As a student he was quiet and a steady worker, preferring to let others talk and play. After graduating in medicine he dedicated his professional life to the study of phthisis and the battle against that disease. The citizens of Wolverhampton will long remember him for his quiet, untruffled demeanour, his attentiveness to their stories, and his sympathetic and skilled handling of their problems. Where administration would fall short, Ogg's smile and encouragement would fortify and revivify. His counsel was sought and much valued by his colleagues in the hospitals of the district. He was a great reader, interested in history and music and with a philosophical bent; his conversation attracted listeners, and a certain pawky humour stimulated talk but repelled pettiness. He is greatly missed by a legion of friends and patients.

Dr. ALICE M. HUTCHISON died at her home at Jordans, Buckinghamshire, on September 29 at the age of 79. Alice Marion Hutchison was born at Dalhousie, India, on August 12, 1874, the daughter of the late Dr. John Hutchison, and was educated at Moffat and Bridge of Allan and at Edinburgh University, where she graduated M.B., Ch.B. in 1899. She proceeded to the M.D. in 1905, and was admitted M.R.C.P. in 1921. Soon after graduation, Dr. Hutchison returned to India for a time and held an appointment at the Dow Memorial Hospital at Gujrat in the Punjab. She then held

various posts in Edinburgh, including those of resident medical officer at the Hospice, medical officer to George Watson's Ladies' College, and physician to the Edinburgh Hospital for Women and Children, until the outbreak of war in 1914, when she helped to organize a hospital unit under the Scottish Women's Hospitals and accompanied the unit to Serbia. In 1917 she was transferred to the R.A.M.C., and remained with the Corps until 1920. For her services Dr. Hutchison was awarded the Serbian Order of St. Sava and the Belgian Order of the Palm Leaf. After the war she settled in practice in London and held the appointments of assistant physician to the South London Hospital for Women, senior clinical assistant at the Hospital for Sick Children, Great Ormond Street, and physician to the children's department of the Tavistock Clinic, the latter appointment indicating her interest in the psychological aspect of children's diseases, in which she specialized. She had also been medical officer to infant welfare centres in Bermondsey and Peckham. She was the author of *The Child and His Problems and Motives of Conduct in Children*.

We are indebted to Dame LOUISE MCILROY for the following appreciation: The sudden and tragic death of Dr. Alice Hutchison has come as a shock to all her friends, of whom she had many. It seems a very short time since I met her at a Serbian reunion, at which she looked so well. Dr. Hutchison was one of the first British women doctors to take out a hospital unit under the Scottish Women's Hospitals to help the Serbian soldiers in 1915. She and her staff stood up most bravely to the dangers and vicissitudes of war, and for a number of months they were prisoners of war in Central Europe. Dr. Hutchison served most of her time on the Serbian front, and was much beloved by her staff and her soldier patients. She kept up the morale of all who were under her care. Later, when the Serbian Army had become scattered, she and her staff looked after Serbian women and children in Corsica, and did excellent work in that way. I can only inadequately express the regard and admiration which I had for Dr. Hutchison and her wonderful unselfish devotion to duty and her kindly attention to anyone in trouble during the war years, with their consequences.

Medical Notes in Parliament

NATIONAL SERVICE BOARDS INQUIRY

Sir WALTER MONCKTON, Minister of Labour, gave the House of Commons on October 27 the results of his inquiry into the work of medical boards examining men for national service.

He stated that he and the Parliamentary Secretary had visited a number of boards. He had had discussions with chairmen of other boards, and officials had attended meetings of chairmen in all regions. These investigations had satisfied him that the medical men who comprised the National Service Medical Boards were fully alive to their responsibilities.

Nevertheless, he continued, some errors in grading had occurred. Special investigation had revealed about 20 such cases, which was not a large number in relation to an annual rate of about 300,000 examinations. The most common factor resulting in a man being placed in too high a grade was the failure on the part of the man to disclose his full medical history. To correct this source of error the notice summoning the man had been revised and now advised him to bring to the board medical evidence of any past disabilities and ailments.

In a few cases there had been a lapse on the part of the board in applying the proper medical standards, and in other cases there had been clerical errors. He proposed to relieve the chairmen of any non-medical work which might be a distraction. As a further safeguard, in future every man summoned to a medical board would be informed by notice that if he had any reason to think he had been given a wrong grading he might appeal in writing within 14 days, enclosing with his appeal any medical evidence. Such

appeals would be referred to the regional medical officer of the Ministry of Health for advice whether medical grounds existed to justify re-examination. Ordinarily any re-examination would be undertaken by a different board.

The boards' task was not easy, and he could assure the House that they had maintained the high tradition of their profession.

Mr. H. R. GOWER, recalling a previous assurance that medical boards would in every case of reasonable doubt refer to the previous medical history of the man concerned, asked if the innovation had been successful. Sir WALTER MONCKTON said that one of the main difficulties—and it was very much to the credit of some of these men—was that they were most anxious not to disclose something to prevent them from doing service. They were trying to ensure that the medical officers had a fair start by knowing the background.

Mental Disorders Inquiry

Mr. D. DONNELLY asked the Minister of Health on October 26 whether he would recommend the extension of the terms of reference of the Royal Commission on the laws relating to mental disorders, so as to enable the commission to consider improvements in the present law and medical treatment of homosexuals. Mr. IAIN MACLEOD replied that it would not be appropriate to extend the terms of reference to cover the law with regard to these cases and their medical treatment. In so far, however, as they might be suffering from mental illness or mental defect their position as regards certification, detention, and care would be covered in the same way as that of other persons so suffering.

Milk-borne Disease

Dr. A. D. D. BROUGHTON asked what progress had been made in the specification of areas under the Food and Drugs (Milk, Dairies, and Artificial Cream) Act, 1950, and the Milk (Special Designations) Act, 1949, for the purpose of protecting the public against milk-borne diseases. Dr. CHARLES HILL replied on October 26 that 48% of the population of England and Wales and 63% of the population of Scotland resided in areas specified by orders which had been made or which were now laid, in draft, before Parliament. Surveys were proceeding with a view to specification of further areas.

Dr. BROUGHTON asked for the approximate date by which the public would be protected against the dangers of bovine tuberculosis, by the whole milk supply being either pasteurized or coming from tuberculin-tested herds. Dr. HILL said he sympathized with the purpose, but it was impossible to forecast when the work of surveying the country would be completed.

Tuberculosis Nursing in R.A.F.

Mr. G. WARD, Under-Secretary for Air, stated in answer to Mr. I. MIKARDO on October 28 that an extra 3s. a day was paid to nursing officers of Princess Mary's R.A.F. Nursing Service below the rank of wing officer when employed full-time on nursing pulmonary tuberculosis cases. Airmen on this work were given an extra 6d. a day, and airwomen an extra 5d.

Mr. MIKARDO commented on the "sharp difference" between 3s. and the other rates, and asked what justification there was—in so far as one could compensate with money for the special risks involved in this work—to compensate with different levels of money. Mr. WARD pointed out that they were dealing with Princess Mary's Nursing Service on the one hand and uniformed airmen and airwomen on the other; but careful precautions were laid down, and taken, and all had to undergo careful medical examination before being accepted for this work.

Mr. A. WOODBURN said that the health authorities did not regard it as desirable that it should be suggested that nurses in this type of nursing were open to any greater risk than they were in an ordinary accident ward, where a proportion of the patients might be suffering from tuberculosis. Mr. WARD agreed, and said that practice in the R.A.F. was in conformity with the practice in civil hospitals.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending October 17 (No. 41) and corresponding week 1952.

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

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

CASES In Countries and London	1953					1952				
	Eng & Wales	London	Scotland	N. Ireland	Eire	Eng & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	20	1	4	0		24	2	8	1	
Dysentery ..	232	35	137	2	1	160	17	96	1	1
Encephalitis, acute ..	2	1	1	0		3		0	0	
Enteric fever: Typhoid ..	0	0	1	1		2	1	0	0	
Paratyphoid ..	11	1	1	0		25	0	0	0	
Food-poisoning ..	156	35		0		162	18		0	
Infective enteritis or diarrhoea under 2 years ..				15	32				18	25
Measles* ..	742	13	41	9	137	5,716	682	90	24	58
Meningococcal infection ..	30	5	8	2		40	4	14	0	
Ophthalmia neonatorum ..	21	1	10	1		28	7	14	0	
Pneumonia† ..	403	25	103	5		416	26	184	2	2
Poliomyelitis, acute: Paralytic ..	81	5	24	8	11	92	8	12	7	10
Non-paralytic ..	45	3				17	3			
Puerperal fever‡ ..	296	42	16	1	1	256	56	19	1	
Scarlet fever ..	1,062	55	189	40	5	1,617	160	303	23	76
Tuberculosis: Respiratory ..			147	19				136	28	
Non-respiratory ..			24	6				21	5	
Whooping-cough ..	2,096	127	229	40	33	1,078	57	79	30	51

DEATHS In Great Towns	1953					1952				
	Eng & Wales	London	Scotland	N. Ireland	Eire	Eng & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	0	0	1	0	0
Dysentery ..	0	4		0		1	1		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	7	1	2	1	3	6		3	3	
Influenza ..	10	1	0	0	0	11	4		0	0
Measles ..		0	0	0	0		0		0	0
Meningococcal infection ..		1	0				0			
Pneumonia ..	176	23	12	5	5	169	27		3	3
Poliomyelitis, acute ..	5	0		1	0	7	0			0
Scarlet fever ..		0	0	0	0		0		0	0
Tuberculosis: Respiratory ..	93	6	8	2	5	81	8	11	2	6
Non-respiratory ..		1	1	0	0		2	3	1	3
Whooping-cough ..	0	0	0	1	0	2			0	0
Deaths 0-1 year ..	192	23	35	3	16	236	34	29	12	12
Deaths (excluding stillbirths) ..	4,931	731	533	97	141	4,771	697	524	97	171
LIVE BIRTHS ..	7,253	1,065	844	198	305	7,726	225	95	234	440
STILLBIRTHS ..	203	35	28			196	19	27		

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

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in September was 117, compared with 110 (revised figure) in the previous month, and 119 (revised figure) in September, 1952.

The number of cases of industrial diseases in the United Kingdom reported during September was as follows: lead poisoning, 1; other poisoning, 1; anthrax, 1; epitheliomatous ulceration, 14; chrome ulceration, 17; total, 34. There were no deaths.—*Ministry of Labour Gazette*, October, 1953.

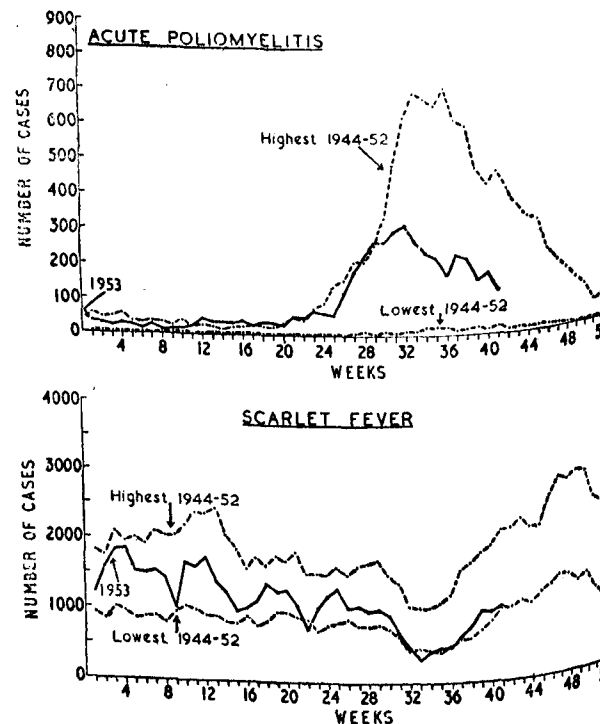
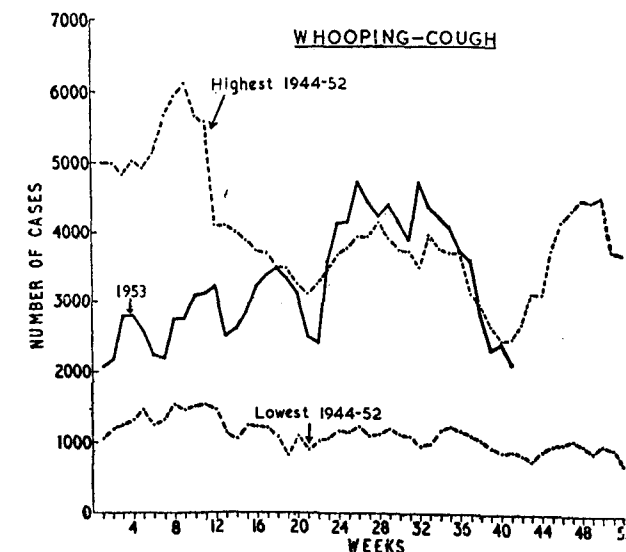
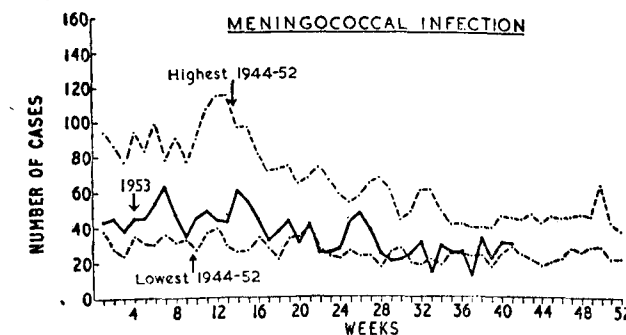
Scotland in 1951

The birth rate in Scotland, as elsewhere in Great Britain, has been falling since 1947, and in 1951 it was 17.7 per 1,000 population as compared with 22.0 in 1947 and 17.7 in 1938.

The death rate in 1951 was 12.86 per 1,000 population. The infant mortality rate at 37.4 per 1,000 live births was the lowest ever reported in Scotland. The decline in the number of deaths from tuberculosis continued, the mortality rate being 43 per 100,000 of the population as compared with 54 in 1950 and 67 in 1949.—*97th Annual Report of the Registrar-General for Scotland, 1951* (H.M.S.O., 11s.).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest variations in the number of notifications of infectious diseases in England and Wales during the week ending October 17 were increases of 76 for scarlet fever, from 986 to 1,062, and 51 for measles, from 691 to 742, and a decrease of 299 for whooping-cough, from 2,395 to 2,096. Only small fluctuations were recorded in the local trends of scarlet fever. An increase of 51 in the number of notifications of measles in Staffordshire, from 49 to 100, was the only large rise in the local incidence. The largest decreases in the incidence of whooping-cough were 67 in Essex, from 178 to 111, and 40 in London, from 167 to 127. 20 cases of diphtheria were notified during the week, and this was the same total as in the preceding week.

126 cases of acute poliomyelitis were notified, and these were 26 fewer for paralytic and 24 fewer for non-paralytic than in the preceding week. The largest returns were Lancashire 16 (Preston C.B. 3), Yorkshire West Riding 12 (Bradford C.B. 3), Warwickshire 11 (Birmingham C.B. 5), London 8 (Lewisham 3), Kent 8, and Middlesex 7.

232 cases of dysentery were notified; these were 35 fewer than in the preceding week. The chief centres of infection were London 35 (Chelsea 9), Northumberland 28 (Gosforth U.D. 19), Lancashire 26 (Liverpool C.B. 12), Yorkshire North Riding 24 (Middlesbrough C.B. 24), Yorkshire West Riding 22 (Bradford C.B. 9), and Middlesex 14.

Week Ending October 24

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,265; whooping-cough 2,190; diphtheria 29; measles 861; dysentery 310; paratyphoid fever 17; and typhoid fever 3. Poliomyelitis notifications were as follows: paralytic, 89 (81) non-paralytic, 46 (45); total, 135 (126). This is an increase of 9 compared with the previous week, the figures for which are in parentheses.

The Services

Surgeon Captain J. B. Oldham, V.R.D., R.N.V.R., has been appointed Honorary Surgeon to the Queen, in succession to Surgeon Captain G. McCoull, O.B.E., V.R.D., R.N.V.R., who has been placed on the Retired List.

Medical News

Annual Meeting at Toronto.—In 1955 the Annual Meeting of the B.M.A. will be held jointly with the Canadian Medical Association in Toronto on June 20-25. There will be a special religious service on Sunday, June 19, and members attending from Britain may wish to assemble in Toronto on June 18. Scientific Sections and Plenary Sessions will meet, and attractive excursions are to be arranged. Special currency allowances for 10 days covering the period of the meeting will be available for a moderate number to attend the meeting from Britain. The following rates are approximate figures:

By Air	
London to Toronto return	£230 first-class
	£190 tourist
Surface Route	
From British port to Toronto and return ..	£160 first-class
	£120 tourist
Combined, air route one direction, reverse surface route	£305 first-class
	£230 tourist

Hotel charges in Toronto have to be paid in dollars and range from approximately 12 dollars a day. The Canadian Medical Association has generously offered to provide private hospitality in Toronto for those who would like it.

Since preliminary arrangements for transport and accommodation should now be made, members who are considering attending the meeting are invited to inform the Secretary of the Association of their intentions, or provisional intentions, as soon as possible. It is particularly important to ascertain at an early date how many may wish to accept the offer of private hospitality in Toronto, and it would be helpful if an indication could be given of the travel arrangements preferred. The Secretary will be glad to supply further information about currency. No assurance can yet be given that dollars will be available for all applicants. The Annual Representative Meeting in 1955 will be held in London. The date has not yet been decided.

Nobel Peace Prize.—Dr. Albert Schweitzer, medical missionary, theologian, and musician, has been awarded the Nobel Peace Prize for 1952. The only other medically qualified recipient of the Peace Prize is Lord Boyd-Orr (1949), though Henry Dunant (1901) received it for his work on behalf of the Red Cross, and Fridtjof Nansen (1922) had made important contributions to neurohistology before taking first to exploration and later to diplomacy.

Albert Schweitzer was born in Alsace on January 14, 1875, the son of the vicar of Günsbach. He studied for the church and became a licentiate of theology in 1900, having obtained his Ph.D. two years earlier. For a short time he held a curacy at St. Nicolaus, Strasbourg. From an early age he was interested in music; he studied under the Parisian organist Widor and from 1903 to 1911 was organist of the Bach Society in Paris. His considerable studies of the works of Bach make him to-day one of the greatest living authorities on that musician. In 1903 Schweitzer was appointed principal of the College of St. Thomas, part of the University of Strasbourg, where he taught theology and wrote many books on this subject, chief of which was his *Quest of the Historical Jesus*, 1906 (English translation 1908).



(Camera Press, Ltd., London)

After a few years Schweitzer became discontented at his inability to give greater service to humanity. He decided to become a medical missionary, began the study of medicine in 1903, and gained his M.D. in 1912. On Good Friday, 1913, he left with his wife for French Equatorial Africa, where he was assigned to the mission station at Lambaréné on the Ogowe River. There he built his own hospital, overcoming immense difficulties. To-day it has beds for nearly 400 in-patients and deals also with a vast number of out-patients. Apart from periodic breaks in Europe, usually to raise funds for his hospital by means of organ recitals, Albert Schweitzer has spent the rest of his life in Lambaréné. He has found time to write many philosophical and theological works, and in them has repeatedly advocated a return to fundamental Christian principles as the only remedy for what he regards as the decline of civilization.

The British Occupational Hygiene Society.—The first conference of this society was opened by Sir Walter Monckton at the London School of Hygiene and Tropical Medicine on November 2. In his address Sir Walter spoke of the need for close collaboration between industrial research and industrial health research, and for the inclusion of education in industrial hygiene in the training of engineers, scientists, medical men, and all others who are concerned with the welfare of the worker. In his presidential address Dr. Thomas Bedford outlined the development of occupational hygiene in Great Britain and defined its scope. He emphasized the need for close team-work between medical men and those trained in other sciences, and spoke of the responsibilities of employers and employed as well as of scientists in ensuring more healthy conditions of work. Three papers were read at the conference. Mr. S. A. Roach dealt with the measurement of the worker's environment, discussing in particular the estimation of the dust hazard in coal mines. Dr. D. G. Harvey spoke on problems of chemical toxicity, and finally Mr. J. E. Braham, in a paper on occupational hygiene and the industrial designer, showed how at nearly every stage of design the requirements of hygiene and of safety demand consideration.

Fog Disaster.—The London Local Medical Committee on October 27 passed the following resolution:

That this committee, representing the 6,000 doctors of London (1) looks forward with deep anxiety to a possible recurrence of the London fog of December last year which directly caused the deaths of over 4,000 persons in Greater London, and serious illness, not recorded in the returns of notifiable disease, to tens of thousands more, flung an unnecessary strain on the public health and general medical services of the capital, disrupted communications and ambulance services, and prevented doctors from reaching patients who urgently needed them;

(2) is profoundly alarmed at the lack of any effective response from official quarters to what can truthfully be described as a national disaster;

and (3) calls upon the Government to take immediate action to prevent a repetition of this disaster.

R.A.F. Medical and Dental Branches Dinner.—The twenty-third annual dinner was held on October 23 with a record attendance of 250. The Director-General of R.A.F. Medical Services, Air Marshal Sir James Kilpatrick, announced the presentation of the Lady Cade Medal to the Royal College of Surgeons by Sir Stanford Cade for annual award to a Royal Air Force medical officer in recognition of outstanding services in a field of Royal Air Force medicine. Sir James went on to emphasize the value of the existing excellent relationship with the Royal Navy, the Army, and the Air Forces of the other members of the Commonwealth and the United States. Wing Commander C. C. Barker, A.F.C., in proposing "The Guests," illustrated the co-operation between the Services and civilian medicine. In reply Mr. H. E. Harding, Dean of the Westminster Medical School, emphasized the contribution of national service to the security of the nation.

Christmas Seals for decorating letters and parcels are once again being offered for sale by the National Association for the Prevention of Tuberculosis, at a cost of 4s. per hundred. The Association is also selling Christmas cards (6s. per dozen, including envelopes). Supplies of both may be obtained through the N.A.P.T., Tavistock House North, Tavistock Square, London, W.C.1. All proceeds from sales will be devoted to the work of the association.

Drunkenness in England and Wales.—According to a White Paper issued recently by the Home Office 53,888 cases of drunkenness were proved in courts in England and Wales during 1952. Of these, 48,694 concerned males and 5,194 females. Each year since 1946 the rate of "proved drunkenness" per 10,000 of population aged over 15 years has risen—from 6 in 1946 to 15.8 last year. The present level is about what it was in the two years before the 1939-45 war, but the curve is now showing signs of flattening out. Methylated spirits is said to have accounted for 569 cases, which is about two-thirds the number in 1938 and double that in 1945, when the low level of 273 cases was recorded. The London City Police District had a rate of 228 per 10,000 of population over 15 years, which compares with 74 for Middlesbrough, the next on the list, and 29 for the Metropolitan Police District. Newcastle-upon-Tyne City and Liverpool City had rates respectively of 68.5 and 61.

Sir Gordon Holmes, F.R.S., the consultant neurologist, was on October 20 presented with the gold medal of the Royal Society of Medicine.

COMING EVENTS

The Bradshaw Lecture will be delivered on November 12 at 5 p.m. at the Royal College of Physicians by Professor E. J. Wayne. His subject will be "The Diagnosis of Thyrotoxicosis."

National Association for Mental Health.—The 10th Inter-clinic conference will be held on November 21 at the Queen Mary Hall, Y.W.C.A., Great Russell Street, London, W.C.1. The conference is limited to professional members of child guidance staffs. Further details may be obtained from the conference secretary, 39, Queen Anne Street, London, W.1.

Leeds University Medical School.—The 63rd annual dinner of past and present men students will be held at the Metropole Hotel, Leeds, on November 27 at 7 for 7.30 p.m. Sir Henry Cohen will be the guest of honour. Tickets and further information from Mr. D. A. Youdale, The Medical School, Leeds, 2.

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 37, No. 11) is now available. The contents include:

BULBAR PRESSURE TEST IN GLAUCOMA. P. L. Blaxier.
CATARACTS IN GALACTOSAEMIA. F. D. McAuley.
DEGENERATION OF VISUAL ACUITY. M. Gilbert.
DEGENERATIONS OF THE DOG RETINA. III: RETINOPATHY SECONDARY TO GLAUCOMA. H. B. Parry.
ANTERIOR FLAP SCIERTOMY WITH BASAL IRIENCLISIS. H. B. Stallard.
CONGENITAL TOXOPLASMOSIS. James Hill.
STANDARDIZED TOMOMETERS IN GREAT BRITAIN. C. R. S. Jackson.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, November 9

MEDICAL SOCIETY OF LONDON.—8.30 p.m., discussion to be introduced by Mr. E. S. Horning, M.A., B.Sc., and Sir Stanford Cade: Hormones in Relation to Cancer.
● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor G. W. Pickering: Concept of Essential Hypertension.
ROYAL EYE HOSPITAL.—5.30 p.m., Professor Thomas Nicol: Surgical Anatomy of the Orbit and Ocular Adnexa.

Tuesday, November 10

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor E. J. King: Alkaline and Acid Phosphatases.
CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, 7.30 p.m., dinner, followed by a discussion: Electronics in Industry and Medicine, to be opened by Mr. P. E. Henderson and Dr. P. Bauwens.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. F. O'Neill: Stress in Relation to Diseases of the Skin.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson Demonstration by Mr. W. H. Jayne: Slide Culture of Malignant Cells.
ROYAL EYE HOSPITAL.—5 p.m., Mr. T. M. Tyrrell: Pitfalls in Refraction.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. E. Roban Williams and Mr. H. G. E. Arthur: Obstetric Pelvis.
WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Mr. G. C. Knight: Diagnosis and Treatment of Spinal Compression.

Wednesday, November 11

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Benign Epithelial Tumours of the Skin.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. D. Ferguson: Prostatic Cancer.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. H. Bickel: Observations on Lignac-Fanconi Disease, Wilson's Disease, and Phenylketonuria.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. J. Greenwood Wilson: Care and After-care—The Cardiff Interpretation (Illustrated).
ROYAL SANITARY INSTITUTE.—2.30 p.m., Discussion to be opened by Dr. E. T. Wilkins, M.Sc., Ph.D.: Air Pollution and the London Fog of December, 1952.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., lecture-demonstration by Dr. D. F. O'Neill: Psychological Medicine.
SOCIETY OF APOTHECARIES OF LONDON.—4 p.m., Professor C. H. Gray: Fluid and Electrolyte Balance; 5.15 p.m., Mr. F. A. Williamson-Noble: Early Treatment of Eye Diseases.

Thursday, November 12

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. Thomas F. Cotton: Psychological Element in Cardiac Disease.
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. R. L. M. Synge, F.R.S.: Principles of Chromatography.
HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Professor J. W. Crofton: Chemotherapy of Pulmonary Tuberculosis.
● INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY.—At National Hospital, Queen Square, W.C., 5.30 p.m., Dr. Helen E. Dimdale: Syndromes Involving the Basal Ganglia: Clinical Types, Diagnosis, and Treatment.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Pathogenesis of Tinea Capitis.
ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. M. T. Morgan: Modern Developments in Rodenticides and Insecticides in Port Health and Quarantine Administration.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Bradshaw Lecture by Dr. E. J. Wayne: Diagnosis of Thyrotoxicosis.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Cecil Joll Lecture by Mr. Geoffrey L. Keynes: Investigations into Thyroid Disease and Tumour Formation.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Mr. A. W. Wilkinson: Reactions to Injury.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Sir Paul Maitlandson: Psychiatry demonstration.

Friday, November 13

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. D. F. O'Neill and Dr. G. B. Mitchell-Heags: Neurodermatoses.
LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—7.30 p.m., clinica meeting.
OSLER CLUB OF LONDON.—At 11, Chandos Street, W., 7.45 p.m., Professor L. Edelstein, Ph.D.: Karl Sudhoff's Contributions to Medical History.
Professor J. Trueta: Michael Servetus.
● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. L. G. Pugh: The 1953 Everest Expedition.

Saturday, November 14

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, St. Mary's Hospital Medical School, 11.30 a.m., scientific papers.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Freeth.—On October 24, 1953, at the Central Middlesex Hospital, London, N.W., to Joan, wife of Derek Freeth, M.D., M.R.C.O.G., a daughter.
Yule.—On October 15, 1953, at the Simpson Memorial Maternity Pavilion, Edinburgh, to Nora (formerly Rendell), S.R.N., S.C.M., wife of D. Robert Yule, a son.

MARRIAGES

Thompson—Logan.—On October 24, 1953, at the Brompton Oratory, London, S.W., Dr. J. H. Thompson, of Croydon, Surrey, to Margaret A. (Gret) Logan, of Darlington, Co. Durham.

DEATHS

Birks.—On October 2, 1953, at The Brackens, Beech, Alton, Staffs, A. Herrenden Birks, M.B., B.Ch., formerly of Dorney Reach, Taplow, Bucks and Woodbridge, Suffolk.
Cairns.—On October 6, 1953, at Green Lea Hospital, Huddersfield, David Louis Cairns, M.D., J.P., of Ashfield, Cedar Avenue, Huddersfield, Yorks, aged 78.
Fraser.—On October 6, 1953, at Torosay, St. John's, Newfoundland, Nutting Stuart Fraser, O.B.E., M.D., aged 89.
Garland.—On October 17, 1953, at 114a, Hampton Road, Bristol, Edwin Blake Garland, M.B., C.M., aged 86.
Harry.—On October 7, 1953, at Saltash, Cornwall, Norman George Harry, M.B., B.Ch.
McKendrick.—On October 7, 1953, at 33, Woodside Grange Road, Finchley, London, N., William McKendrick, M.B., aged 74.

Any Questions?

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

Stress and Arterial Disease

Q.—What part do stress and strain play in the aetiology of arterial disease, particularly of the coronary and cerebral arteries?

A.—This question is difficult to answer, because there are insufficient scientific data on the point. The Ministry of Pensions admits that stress and strain may aggravate hypertension, and allows this in certain cases if it can be shown that symptoms did in fact arise during service. On the other hand, the Ministry does not agree that stress and strain play any part in the development of coronary or cerebral atherosclerosis and their complications, and has been in the habit of quoting opinions of eminent cardiologists who have held this view in the past. These opinions are rarely based on statistical evidence.

It has long been known that there is a loose relationship between atherosclerosis and hypercholesterolaemia, whether the latter is spontaneous, hereditary, or a complication of diabetes mellitus, myxoedema, xanthomatosis, or nephrosis. The work of John Gofman shows that there is a closer relationship between atherosclerosis and certain large fat molecules which can be identified in the blood stream by a special ultracentrifuge technique. It is highly improbable that there can be any relationship between stress and strain and the concentration of these large fat molecules in the blood stream. It is believed, however, that the deposition of lipids in the intima depends not only on the concentration of these substances in the plasma but on some structural, functional, or biochemical change in the intima which favours the penetration and laying down of fatty substances. Such structural changes have been demonstrated under the microscope.¹

The idea that stress and strain aggravate or accelerate atherosclerosis and precipitate its complications has grown up not only as the result of the experience of some physicians but also as a result of at least three careful statistical studies, the first by Ryle and Russell,² the second by Yater *et al.*,³ and the third by Morris, Heady, and Barley.⁴ These three studies have one thing in common: they all demonstrate a relationship between occupation and the incidence of angina pectoris or coronary thrombosis. The statistics presented by Ryle and Russell appeared to show that coronary disease was about 10 times more common in professional men whose occupations involved mental stress and responsibility than in manual labourers. Although this remarkable difference did not apply to the wives of such men, this work has been criticized because it was based on the Registrar-General's figures compiled in 1932, for at that time coronary thrombosis had been recognized in Great Britain for only about eight years, and it was felt that professional men might have been more accurately diagnosed. From the U.S. Army Institute of Pathology, Yater *et al.* obtained impressive evidence that coronary disease was twice as common in the relatively young men entering the Army from civil occupations carrying mental stress and high responsibility, as in those whose previous work was of a lower order. The statistical analysis presented by Morris and his colleagues seems to show that coronary disease is twice as common in general practitioners as in other doctors.

If the relationship between occupation and coronary disease is admitted, and it surely must be, the nature of the relationship is still obscure. While Ryle and Russell

believed that stress and strain were the operative factor, the Ministry of Pensions holds that there is no proof of this. Thus it might simply be that the professional classes are better fed or have a more fatty diet, or, being more sedentary, tend to store fat more readily. This is really the crux of the matter, and the problem has not yet been solved.

REFERENCES

1. Moon, H. D., and Rinehart, J. F. (1952). *Circulation*, 6, 481.
2. Ryle, J. A., and Russell, W. T. (1949). *Brit. Heart J.*, 11, 370.
3. Yater, W. M., *et al.* (1948). *Amer. Heart J.*, 36, 334.
4. Morris, J. N., Heady, J. A., and Barley, R. G. (1952). *British Medical Journal*, 1, 503.

Congenital Lymphoedema

Q.—A female child, now aged 4½, was noted at birth to have oedema of both hands and both feet. In about a month's time the hands were fairly normal but the feet were still swollen, and at 5 months old the feet, while still a little swollen, were much improved. At a year old the child had intermittent swelling of the right arm and hand, and slightly of both feet. This became less frequent, and for several years nothing abnormal was observed. The mother now complains that in the evenings the child's right foot and ankle swell. When seen in the morning the foot appears perfectly normal. The child is small for her age, but otherwise there is no abnormality. The urine is free from albumin. A cousin of the mother's is said to have marked oedema of the feet and legs which came on at the age of 14 (she is now 40) and is thought to be due to "bad circulation." I would welcome advice on this case.

A.—It is a little dangerous to give an opinion on such a question without seeing the child, but the likely diagnosis is congenital lymphoedema. This condition may be present from birth or appear later, and the degree of oedema of the limbs may vary considerably. It is possible that the swelling in this case never completely disappeared, as this is the commoner finding.

The cause is not clearly understood, apart from the fact that some abnormality of the lymphatics is present, which may be an undue permeability or an obstruction to the lymphatic return. This may be local or generalized. There is some evidence that the exuded lymph is damaging to living cells and causes the dense fibrosis which later invades and causes permanent swelling of the limbs. It is therefore possible that restriction of the oedema in early life by rest in bed or bandaging may help to diminish later irreversible changes, but it is generally considered to be hardly worth while. Plastic surgery in early adult life or late childhood can greatly improve the appearance of badly swollen limbs by removing the fibrosed subcutaneous tissues.

Postponing Menstruation

Q.—I have been asked by a patient, shortly to be married, whether I can stop her period, which is due during her honeymoon. I believe it is possible to do this with stilboestrol or allied compounds. If this is so, I should be grateful for information on the following points: (a) Is it safe? (b) Is the period suppressed or merely delayed? (c) What is the best compound dosage and correct time for starting? This patient goes two weeks and four days between periods. (d) Are any effects to be expected on her libido?

A.—It is often but not always possible to postpone a menstrual period with oestrogens, provided a large dose is given. Different techniques are employed, but one of the most reliable is to give not less than stilboestrol 1 mg. three times a day beginning at the conclusion of a menstrual period and continuing until there is no need to delay the bleeding any longer. When treatment is suspended uterine haemorrhage will begin within a few days and it will probably be anovular in type. Moreover, it is likely to be prolonged and heavy. A further disadvantage is that the stilboestrol may cause nausea and vomiting to the extent of interrupting treatment, and this precipitates oestrogen withdrawal bleeding at an inconvenient time. The risk of vomit-

ing is reduced by giving ethinyl oestradiol instead of stilboestrol, the dose being 0.05 mg. three times a day.

Treatment of this kind will not materially affect libido, and it can hardly be described as unsafe. Nevertheless it does interfere with the natural ovarian and uterine rhythm, and the ultimate bleeding can be troublesome. There should therefore be a good reason for its application, and the one stated in the question is, in the writer's opinion, inadequate. The various emotional changes associated with marriage often temporarily disturb the menstrual cycle and render calculations inaccurate. It may well be that the expected clash between honeymoon and menstruation will not occur. If it does, it matters little. It is better to face embarrassment than to meddle with physiological processes, while interruption of coitus for a few days can be an advantage if the partners experience the usual difficulties associated with the consummation of marriage.

Alcohol and Barbiturates

Q.—There have been two recent reports of death caused by barbiturates following the consumption of alcohol. Is this a common occurrence? How does it affect the taking of normal doses of barbiturates by heavy drinkers, and conversely the consumption of alcohol by constant users of barbiturates?

A.—The available evidence suggests that it is unusual for death to be caused by a combination of a barbiturate and alcohol. Both these substances are depressants to the respiratory centre, and death occurs from their combined action in the same way as it would if a large dose of ether were administered after a full dose of thiopentone. There is some evidence that patients who have taken barbiturates may die with blood alcohol levels in themselves insufficient to cause death.¹ It is probable that heavy drinkers can take normal doses of barbiturates and that constant users of barbiturates can take their usual dose of alcohol without danger to life. But the margin of safety is lowered in both instances. It is wise to warn patients receiving barbiturates in doses above the maximum official dose that they should be sparing in their consumption of alcohol. It is also dangerous to attempt to wean a chronic alcoholic from his drink by substituting barbiturates unless one can be sure that he will not indulge in an alcoholic bout. Further information on this subject will be found in a recent annotation.²

REFERENCES

- ¹ Jetter, W. W., and McLean, P. (1943). *Arch. Path., Chicago*, 36, 112.
- ² Fisher, R. S., Walker, J. T., and Plummer, C. W. (1948). *Amer. J. Clin. Path.*, 18, 462.
- ³ *British Medical Journal*, 1953, 1, 1269.

Routine Lumbar Puncture in Primary Tuberculosis

Q.—Frequently one hears the opinion that children with primary tuberculosis should have routine lumbar punctures in order to detect cases of meningitis very early. Do you think it likely that this procedure might cause meningitis by releasing the pressure over an unsuspected subcortical tubercle so that it ruptures into the C.S.F.?

A.—The incidence of tuberculous meningitis in primary tuberculosis is so low that routine lumbar puncture is justifiable only when miliary disease is present, and perhaps in a case of primary tuberculosis running a persistently high fever.

A number of people have seen cases of tuberculous meningitis develop a few days after routine lumbar puncture. Bernard and his colleagues¹ in Paris investigated this point in a large series of cases of miliary tuberculosis, but the incidence of meningitis was no higher in those who had routine lumbar punctures. If routine lumbar puncture is performed in the types of cases indicated above, it will enable meningitis to be detected in its earliest and most treatable stage.

REFERENCE

- ¹ Bernard, E., Kreis, B., Lotte, A., Chiche, P., and Paley, P. V., *Sem. Hôp. Paris*, 1949, 25, 2053.

Action of the Sternomastoids

Q.—What is the combined action of both sternomastoid muscles and does it differ when they are acting against resistance? What is the full action of a single sternomastoid? I am interested in congenital torticollis and find some confusion in the literature as to the position necessary to stretch this muscle—that is, whether to flex or extend the neck.

A.—The combined action of the sternomastoids is to flex the head on the trunk. Their action against resistance is not essentially different, but if the neck is kept rigid by the extensor muscles the sternomastoids can act as accessory muscles of respiration—for example, in a severe poliomyelitis with paralysis of the intercostals.

When one sternomastoid acts it laterally flexes the head towards the same side and rotates the face away from that side. Stretching of a tight sternomastoid is accomplished by laterally flexing the head away from the affected side and flexing the neck. Rotation of the head does not affect the length of the muscles to any important extent.

NOTES AND COMMENTS

Otitis Externa in the Tropics.—Dr. IAIN M. M. MACLEAN (London, S.E.4) writes: Having experience of various climates, for example, arctic and tropical, I think that the name otitis externa is not quite accurate ("Any Questions?" October 17, p. 896). The condition has many local names such as "Panama ear," and I am of the opinion that it—that is, otomycosis—should be described technically as either otitis externa diffusa or desquamative external otitis, as it does differ from the otitis externa in other climates. In the acute stage I noticed that the pain was always worse at night (but the cause was not always of a clinical nature) and was accompanied by moderate pyrexia. When the canal is not obliterated, I found (apart from what you have said) that gauze soaked in 10% glycerin and ichthammol helped if combined with daily swabbing with spirit and painting with, say, Castellani's fuchsin. An ammoniated mercurial ointment was used to treat the excoriations. While non-fungus infections of the canal occur, are they not usually seen in those who have recently returned from a temperate climate?

OUR EXPERT writes: The desquamative external otitis seen in the Tropics was very clearly described by Daggett.¹ This condition, though common in the Tropics, is indeed sometimes seen in temperate climates. Fungus infections are also on the increase in temperate climates, and this may be due to the use of certain antibiotics which allow fungus infections to develop.

REFERENCE

- ¹ *J. Laryng.*, 1942, 57, 427.

Correction.—We regret that Dr. R. M. Mason was given wrong initials in a leading article on phenylbutazone last week (p. 982).

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

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 14 1953

VALVOTOMY IN THE TREATMENT OF MITRAL STENOSIS

BY

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The selection of patients who need surgical treatment for mitral stenosis is a problem which is no longer confined to special centres for cardiac surgery. If patients who are in greatest need of surgical treatment, and who are most likely to benefit from it, are to be given priority, selection must start with the practitioner and in the general medical clinic.

The advent of valvotomy as a method of treatment has stimulated an intensive investigation of the pathological physiology of mitral stenosis by means of cardiac catheterization and related technical procedures. This has led in turn to a renewed interest in the interpretation of clinical signs and symptoms. Many physical signs which have been a source of speculation since the early days of auscultation can now be more precisely interpreted in the light of surgical experience and of recent haemodynamic research. Many of the patients in the present series, and a great many others judged unsuitable for operation, have been investigated by cardiac catheterization, and, at the start, the information so obtained often fortified the decision for or against operation. But with increasing experience we are now seldom influenced by catheter findings in selecting favourable cases for surgery. Admittedly, in extending the scope of surgery to less favourable cases, full investigation is still desirable.

The low mortality and good results of mitral valvotomy are already well known, and it is with the indications for operation that we are now mainly concerned. In this respect we were guided from the start by the pioneer work at Guy's Hospital (Baker, Brock, and Campbell, 1950) and in the United States (Harken *et al.*, 1948; Bailey, 1949), but our present views have been moulded largely by personal experience.

SELECTION OF CASES FOR VALVOTOMY

Basic Indications.—The aim of surgical treatment of mitral stenosis is to remove or reduce valvular obstruction without thereby creating serious valvular incompetence. Provided the fused mitral cusps are split or cut along the line of the commissures, as advocated by Brock, the degree of incompetence need not be increased, and may even be diminished, by valvotomy. The basic

indications for mitral valvotomy may therefore be simply stated as follows: (1) Severe stenosis of the mitral orifice, the anatomical conformation of which must be suitable for surgical correction. (2) The patient's symptoms must be disabling enough to warrant the risks of surgery. (3) We must be satisfied that the symptoms are entirely or mainly due to mitral obstruction, and not to myocardial or other valvular lesions, or to extra-cardiac causes.

Degree of Mitral Stenosis and its Anatomy

If mitral stenosis were a purely mechanical constriction of the valvular orifice, of unvarying anatomical form, and superimposed on an otherwise healthy heart, it would be a relatively simple matter to assess its degree, but in practice the problem is far more complex. We have to take account of the anatomical form of the valvular structures, of secondary changes in the lung vessels, and of complicating factors such as myocardial damage, auricular fibrillation, and associated aortic and tricuspid valve lesions. Nevertheless, in many cases the rheumatic damage falls mainly on the mitral valve cusps.

The ideal type of stenosis for surgical correction is the *diaphragmatic valve* well described by Balfour (1898) as follows: "The condition of the valve generally associated with the presystolic murmur is that usually termed a diaphragmatic valve in which the two segments of the mitral valve are united and stretched like a diaphragm across the auriculo-ventricular opening. This diaphragm, as we may call it, is thickened especially at the edges of the central opening. . . . Apart from the thickened orifice, the mitral diaphragm as a whole may be relatively pliant, and it can be split so as to re-create mobile and supple valve flaps, and so that obstruction is relieved without incompetence resulting (Type I, Fig. 1). The diaphragmatic valve, which is formed mainly by the large antero-medial or aortic cusp, cannot open or close, but, if still pliant, it balloons like a sail towards the auricle in systole, and billows back towards the ventricle in diastole. This sudden tension of the mitral diaphragm, first in one direction and then in the other, gives rise to important physical signs, which are discussed below.

Sometimes the valve sheet as a whole is indurated and thickened so that ballooning is reduced and at the same time valvotomy made more difficult technically (Type II, Fig. 1). Most valves in this category cannot be completely divided, but an adequate result may be achieved if one commissure is split and the other only partly split. Here the extent of shortening or fibrosis of the chordae tendineae is greater than in Type I, and mobile cusps cannot be reconstructed.

More severe rheumatic damage may fuse the cusps, chordae, and papillary muscles into a rigid, fibrous, funnel-shaped structure directed towards the ventricle (Type III, Fig. 1). If cases for surgery are carefully selected, the surgeon seldom encounters this type of stenosis, which features so prominently in textbooks of pathology. Here little can be done by operation, yet digital dilatation has occasionally produced unexpected clinical improvement.

Deformed and retracted cusps producing a permanently gaping and incompetent orifice, even though some degree of stenosis may be present, are not amenable to surgical reconstruction. Graham Steell (1906) and Carey Coombs (1924) regarded mitral regurgitation as due mainly to dilatation of the left ventricle and of the mitral ring from myocardial damage during the active phase of rheumatic carditis, so that subsequent fibrosis of the cusps failed to constrict the enlarged orifice appreciably. Others regarded the left ventricular enlargement as the result rather than the cause of mitral regurgitation. Whichever view is taken, and both may be correct under different circumstances, the fact remains that left ventricular enlargement and mitral incompetence go together, and both are probably incompatible with a severe degree of mitral stenosis. An enlarged left ventricle should be regarded as evidence of myocardial damage, whether of inflammatory or of mechanical causation.

Clinical Signs

The clinical signs of a pliant diaphragmatic valve are, first and foremost, the snapping first sound, and the

characteristic apex beat described by Broadbent (1897) as "tapping," an adjective originally applied to the first sound by Sansom (1892). Carey Coombs described the apex beat of mitral stenosis as follows: "The hand placed over the praecordium feels the apex bang suddenly and sharply against the chest wall, then sink away from it as suddenly as it arrived." These signs relate to a sudden tension of the pliant mitral diaphragm as it is ballooned upwards into the auricle in systole, and can be felt by the surgeon's finger. We may well speak of this sign as the "closing snap" of the mitral valve. So long as a snapping first sound is audible, and it is best heard with the patient lying and inclined toward his left side, serious mitral incompetence and a hopelessly rigid valve are unlikely, and a systolic murmur may be ignored.

Another important sign of a diaphragmatic valve is the opening snap, a sharp click which follows closely after the second sound and which is best heard over the mesocardium often internal to or above the apex beat. The opening snap, formerly described as a double second sound at the apex, was first recognized by Sansom as originating at the mitral valve, and the term "claquement d'ouverture" is generally attributed by French writers to Potain. It may be supposed that the opening snap is caused by sudden tension of the pliant mitral diaphragm in a reversed direction to that responsible for the snapping first sound—namely towards the ventricle at the start of diastole. We believe that a loud opening snap of clicking quality is a reliable sign of mitral stenosis with a pliant diaphragmatic valve.

and that it constitutes important evidence of operability. The opening snap is absent in predominant mitral regurgitation, and is uncommon or lacks a loud clicking quality in severe mitral calcification (Mounsey, 1953; Wyn 1953).

In regard to murmurs, loud rumbling diastolic and pr systolic murmurs completely filling diastole constitute reliable evidence of considerable mitral stenosis, though it does not necessarily imply an operable valve. The absence of an impressive mitral diastolic rumble does not exclude severe stenosis, and Levine and Love (1952) have drawn attention to the occasional absence of all diastolic murmur in this condition. The intensity of the diastolic murmur depends not only on the degree of stenosis but also on the flow through the mitral orifice, and active pulmonary vasoconstriction acts as a barrier to mitral flow. In cases with

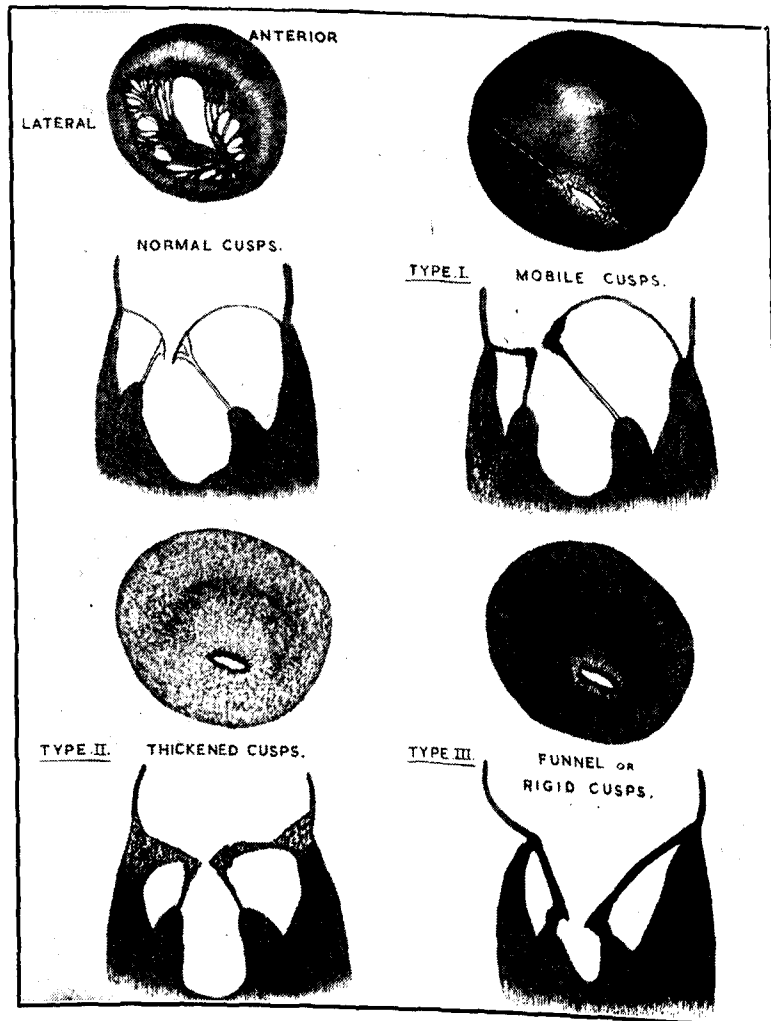


FIG. 1.—Types of mitral stenosis. The features of each type are described in the text.

severe pulmonary hypertension the mitral diastolic murmur may be quite insignificant, though the opening snap tends to persist.

A mitral systolic murmur need not imply serious incompetence in the presence of a snapping first sound and an opening snap; it may be ignored unless there is evidence of left ventricular hypertrophy in the form of an apex beat with a localized and sustained thrust, the "choc en dôme" of Bard. If the first sound is diminished or replaced by a systolic murmur, and the left ventricle is enlarged, the case is probably unsuitable for valvotomy. The electrocardiogram and radiograph are valuable in identifying left ventricular hypertrophy. In evaluating left ventricular enlargement *vis-à-vis* the mitral valve, due regard must be given to the presence of aortic incompetence.

The pulse in severe mitral stenosis is of small volume and sustained in character, and, like the small aorta, is evidence of a restricted output from the left ventricle. It is especially small in cases with active pulmonary hypertension, when the cardiac output is further reduced by a second mechanical barrier in the lungs. In predominant mitral regurgitation the pulse has a more jerky character.

A small hypoplastic aorta is the rule in severe mitral stenosis developing before adult life, and the aortic knuckle is small in the radiograph, situated well below the clavicles, and sometimes invisible in the anterior view.

To sum up, we regard the following clinical signs of mitral stenosis as indicative of a pliant diaphragmatic valve amenable to valvotomy: a snapping apex beat; a snapping first sound (closing snap); and a loud opening snap of clicking quality. Additional evidence of severe mitral stenosis is provided by intense diastolic and presystolic murmurs; a small sustained pulse; and a small hypoplastic aorta in the radiograph.

Signs of Right Ventricular Enlargement

When the right ventricle enlarges, the infundibulum is first involved, causing a palpable systolic impulse on the left of the sternum, usually in the third interspace and well above the apex beat. A diastolic shock due to forcible closure of the pulmonary valves is also felt over the enlarged infundibulum.

The main cavity of the right ventricle enlarges towards the left, displacing the left ventricle posteriorly away from the chest wall. In pure mitral stenosis, therefore, an apex beat displaced to the left is evidence of right ventricular enlargement. The right ventricle seems to strike the chest broadside, so that the apex beat resembles a blow with the open hand, compared with a blow by the closed fist from the left ventricle, which strikes the chest head on. Instead of a localized thrust, the enlarged right ventricle causes a diffuse and less-sustained pulsation between sternum and apex beat which, in mitral stenosis, also has a snapping quality.

In radiographs, right ventricular enlargement gives the heart a square shape with blunted apex, compared with the pointed oval of left ventricular enlargement. Right heart enlargement may also be identified in the left oblique view.

Symptoms

Breathlessness is the earliest symptom in the majority of cases and its onset is usually gradual. Patients notice that they can no longer keep pace with their friends, carry their shopping, or perform their usual domestic duties without distress, and their disability is best assessed in terms of their capacity for these simple everyday tasks. Sometimes attention is first called to the heart by more dramatic symptoms of a characteristic kind.

In 1921, and more fully in 1934, Gallavardin described the occurrence of paroxysmal pulmonary oedema in certain cases of mitral stenosis, which he called "le rétrécissement mitral oedémateux," and this particular syndrome was also

described by Oppenheimer and Schwartz (1933) and by McGinn and White (1934). It is encountered especially in women aged 25 to 35 years with long-standing mitral stenosis. The paroxysms of dyspnoea are often provoked by effort or emotion, but may also occur spontaneously at night, and tend to be aggravated during the menstrual period, during pregnancy, and in cold weather. Gallavardin noted that in such patients the heart was little if at all enlarged, the rhythm was regular, and digitalis was ineffective in controlling the breathlessness.

Careful interrogation is necessary to identify minor paroxysms provoked by effort; once dyspnoea attains a certain degree the following symptoms appear—oppression in the chest, severe palpitation, tracheal bubbling and wheezing, cough, and blood-stained expectoration. These symptoms subside gradually with rest. Spontaneous or nocturnal attacks tend to be more severe, may be accompanied by circulatory collapse, and may prove mortal. Sooner or later these patients become orthopnoeic, require extra pillows for sleep, and exhibit some degree of persistent pulmonary congestion. The patient with "oedematous mitral stenosis" is severely incapacitated and offers a marked contrast to the patient with a huge heart, auricular fibrillation, and congestive failure reasonably controlled by digitalis, who may lead a relatively comfortable though restricted life.

Paroxysmal pulmonary oedema is explained by a sudden increase in pulmonary capillary pressure above the level of the colloid osmotic pressure of the plasma. Opposed by severe mitral obstruction, any increase in the output of the right ventricle—for example, on exertion—must elevate the pressure in the pulmonary veins and capillaries. In the past it was difficult to explain why pulmonary oedema should occur in certain cases of severe mitral stenosis and not in others, often with far larger hearts; the probable explanation is that in some cases the pulmonary arterioles are constricted, thus limiting the output of the right ventricle and so protecting the lung capillaries from any sudden overdistension. In mitral stenosis with pulmonary oedema, pulmonary hypertension is a purely passive process, due to a rise in pressure behind the obstructed mitral valve, and the absence of cardiac enlargement and of auricular fibrillation indicates that the myocardium is relatively intact. This combination of severe mechanical obstruction and a sound myocardium represents the ideal condition for surgical intervention.

Classification of Cases for Surgical Purposes

For the purpose of deciding suitability for valvotomy and for assessing its results, a classification based purely on symptoms or the degree of incapacity is unsatisfactory. A patient with symptoms of great severity may be most eligible for surgical relief, whereas another far less troubled may be entirely beyond it.

The pulmonary arterial pressure at a given moment is not a reliable basis for deciding on surgical treatment unless it is interpreted in relation to the clinical signs and symptoms, and a complete haemodynamic investigation is not always practicable even in expert hands. We believe that, eventually, suitability for valvotomy will usually be decided on the basis of routine cardiological examination rather than on catheter findings. The primary indication for valvotomy is severe mitral obstruction with an operable valve, and in this respect the clinical signs of a pliant diaphragmatic valve are significant. Next in importance is the size of the right ventricle. If tricuspid disease is excluded, right ventricular enlargement provides the best measure of the degree of permanent damage resulting from mitral stenosis, and thus it is the best guide in regard to the prospect of surgical relief. At the Middlesex, having selected the cases with operable valves, we graded them for surgical purposes into three classes, identifiable by routine cardiological examination:—Class I: cases without or with minimal signs of right ventricular enlargement; class II: cases with con-

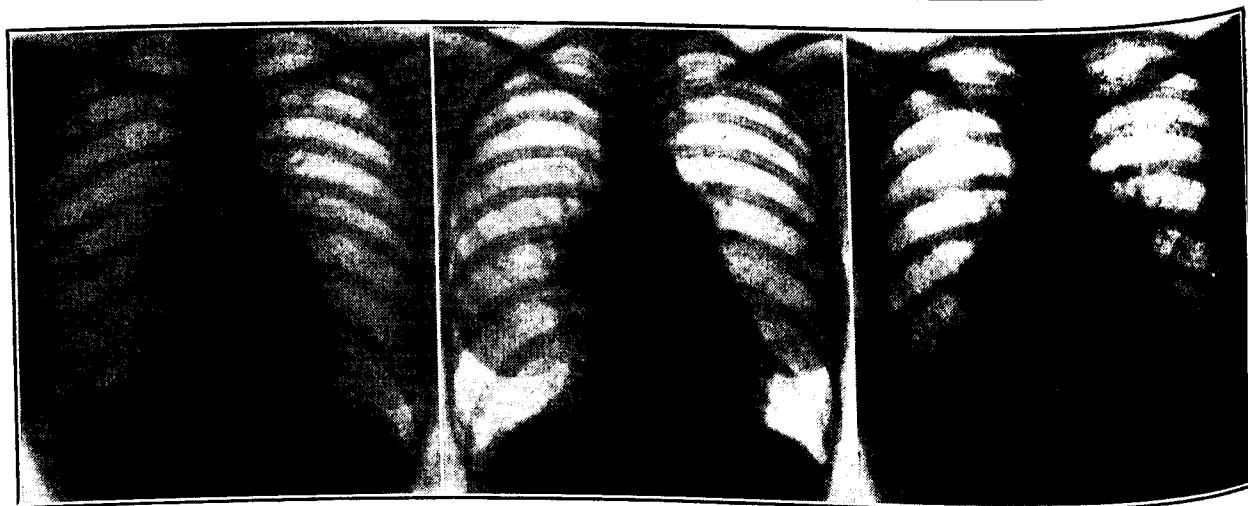


FIG. 2

FIG. 3

FIG. 4

FIG. 2.—Mitral stenosis with clinical signs of slight right ventricular enlargement (class I). The patient, a woman aged 36, in sinus rhythm, had several attacks of pulmonary oedema. Valvotomy was performed with a good symptomatic result (Case 55). FIG. 3.—Mitral stenosis with clinical and electrocardiographic evidence of right ventricular enlargement (class II). The pulmonary artery and its hilar branches were dilated. Mean pulmonary arterial pressure was 54 mm. Hg. The patient, a woman aged 28, was considerably restricted by breathlessness. A good result followed valvotomy. FIG. 4.—Mitral stenosis with considerable cardiac enlargement (class III). Cardio-thoracic ratio 68%. Mean pulmonary arterial pressure was 48 mm. Hg. The patient, a woman aged 48 with auricular fibrillation, had recurrent attacks of congestive failure which improved with treatment.

siderable right ventricular enlargement, but without congestive failure; class III: cases with gross right ventricular enlargement and congestive failure.

Class I.—Regular rhythm was more common than auricular fibrillation, the pattern of right ventricular hypertrophy was seldom present in the electrocardiogram, and radiography showed a mitral configuration without much increase in transverse diameter of the heart. There was often perihilar congestion, but without great dilatation of the pulmonary artery (Fig. 2). The mean cardio-thoracic ratio in this group was 51%. Paroxysmal pulmonary oedema was common. The mean pulmonary arterial pressure averaged 35 mm. Hg.

Class II.—Right ventricular enlargement was evident clinically, radiologically, and in the electrocardiogram. Normal rhythm was more common than auricular fibrillation, and paroxysmal pulmonary oedema was less frequent than in class I. In some cases, episodes of congestive failure occurred, due to the onset of fibrillation or to pulmonary infarction, but failure was not persistent. Dilatation of the pulmonary artery and its hilar branches was evident in radiographs, but perihilar oedema was often absent (Fig. 3). The mean cardio-thoracic ratio was 55%. The mean pulmonary arterial pressure averaged over 50 mm. Hg, indicating active pulmonary hypertension. These patients have severe mitral obstruction with some myocardial damage.

Class III.—The heart was considerably enlarged, the cardio-thoracic ratio exceeding 65% (Fig. 4). Aortic valve

disease was present in some cases, and often tricuspid incompetence. Auricular fibrillation was invariable, and congestive failure was recurrent or could not be completely relieved by treatment. The liver was permanently enlarged and presumably damaged. Patients in this class posed the problem of whether the mitral obstruction played a sufficiently important part in the overall picture to justify mitral valvotomy. If the signs of a pliant diaphragmatic valve were present it was thought that some measure of surgical relief was at least possible.

Table I presents an analysis of the first 72 cases operated on at the Middlesex Hospital, classified as described.

Results

Mitral valvotomy has been performed on 150 patients—87 at the Middlesex Hospital and 63 at Harefield Hospital and the London Chest Hospital. There were 31 men and 119 women, a ratio of 1 to 4. The youngest patient was 19 and the oldest 57; 78% were between 30 and 49. The heart rhythm was regular in 88 patients (59%), and auricular fibrillation was present in the remaining 62 (41%). The incidence of certain other clinical features is mentioned below.

Four of the 150 patients operated on died as a direct result of the operation—that is, within four days—an immediate operative mortality of 2.7%. Four others died after an interval of one month or longer. Details of these fatalities are given later.

TABLE I.—Mitral Valvotomy: Analysis of the First 72 Cases Operated on at the Middlesex Hospital. Results According to Classification

Class	No. of Cases	Duration of Symptoms (Years)	Orthopnoea	Paroxysmal Dyspnoea	Haemoptysis	Pulsus Parvus	R.V. Pulsation	Pulmonary Diastolic Shock	Auricular Fibrillation	E.C.G. Signs of R.V. Enlargement	Pul. Arterial Pressure* (mm. Hg)	Pul. Capillary Pressure* (mm. Hg)	Cardio-thoracic Ratio (%)	Result†	
														Good	Fair or Poor
I	33	6	21 (64%)	20 (61%)	25 (76%)	9 (27%)	23 (70%)	14 (42%)	10 (31%)	0 (0%)	35	20	51	73%	23%
II	30	7	17 (57%)	9 (30%)	20 (67%)	14 (47%)	25 (83%)	22 (73%)	6 (20%)	30 (100%)	54	25	55	69%	1 late death 19%
III	9	12	8 (89%)	6 (67%)	4 (44%)	1 (11%)	5 (56%)	2 (22%)	8 (89%)	1 (11%)	28	19	63	40%	1 late death 20%
Total	72		46 (64%)	35 (49%)	49 (68%)	24 (33%)	53 (74%)	38 (53%)	24 (33%)	31 (43%)	55	22			2 operative deaths

* In class III there were two results only.

† Results apply to 61 cases adequately followed up.

One hundred and eleven patients have been followed up for periods of five months to two and a half years. The results are given in Table II. The remaining 39 have been

TABLE II.—Mitral Valvotomy: Results

Result in 111 cases:	81 (74%)
Good	9
Fair	13 (20%)
Poor	13
Too early for assessment	39
Operative deaths	4 (2.7% of whole group)
Later deaths	4
	150

operated on within the past three months. All have made satisfactory progress to date, but it is too early to assess the results.

In each case the result was assessed in relation to the pre-operative disability. A good result indicates relief from symptoms such as paroxysmal dyspnoea, orthopnoea, and haemoptysis, and a considerably increased capacity for effort. For example, a more or less bedridden patient is able to sleep flat and to get about in comfort; an ambulant patient whose activities had been much restricted is able to lead a reasonably normal life or to return to work. A fair result implies an obvious and worth-while relief of disability, but short of the optimum improvement. A poor result means slight, doubtful, or no benefit.

Results in Relation to Classification of Cases.—The number of patients in each class is too small to allow of any far-reaching conclusions, but the results indicate a trend. Provided that clinical signs of a pliant diaphragmatic valve are present, the outlook after operation differs little in classes I and II, though in class II the right ventricle is larger and the pulmonary arterial pressure is correspondingly higher. Those in class III have the largest hearts and there is usually a history of recurrent congestive failure; they fare less well and carry a higher operative risk than cases in classes I and II.

SPECIAL FEATURES

Pulmonary Hypertension

The pulmonary arterial pressure by itself does not provide an indication of the degree of mitral stenosis. In cases with paroxysmal pulmonary oedema the mean pulmonary arterial pressure at rest may be little raised, and again in the later stages of mitral disease, when auricular fibrillation and failure have supervened, it need not be greatly elevated. On the other hand, the size of the right ventricle reflects the cumulative effect of pulmonary hypertension on the heart, and is more informative than the level of the pulmonary arterial pressure at a given moment.

The factors responsible for pulmonary hypertension complicating mitral stenosis are beyond the scope of this paper. We were concerned, however, in observing whether pulmonary hypertension influenced the result of mitral valvotomy. The good and poor results in classes I and II were of much the same order, though the degree of pulmonary hypertension was far higher in class II. The outcome of operation was equally favourable in the six patients with

the highest pulmonary arterial pressures and greatly increased pulmonary vascular resistance, and in the six with the lowest pressures recorded in this series who had only slightly raised pulmonary resistance (Table III).

Pulmonary arterial pressure has been measured approximately one year after operation in two patients (Nos. 9 and 1) included in Table III. In both, the mean pressure had fallen, the cardiac output increased, and the total pulmonary vascular resistance lowered by 50% and 60% respectively of their original values. The final figures were still well above normal, yet symptomatic improvement was satisfactory. Similar findings have been reported by other authors (Holling, 1952; Baker, Brock, Campbell, and Wood, 1952).

In mitral stenosis with gross right ventricular enlargement other factors than pulmonary hypertension have to be considered—namely, rheumatic myocardial damage, the effects of auricular fibrillation, and the possibility of associated tricuspid valvular disease.

Rheumatic Myocardial Damage

The relative importance of a defective valve and of rheumatic myocardial damage in the causation of cardiac enlargement and failure is an old-standing problem. Experience of the results of valvotomy has proved that the valvular factor is often far more important than Mackenzie and others believed and taught.

Nevertheless, a grossly enlarged right ventricle implies a damaged myocardium, and whether the damage is rheumatic or whether it is due purely to mechanical stress, it is unlikely to be reversible. The degree of benefit to be expected from valvotomy when the myocardium is permanently damaged is always problematical and the operative risks must be increased. Provided that tricuspid disease is excluded and there are signs of severe mitral stenosis with an operable valve, surgery need not be contraindicated if the age and other circumstances are favourable.

Auricular Fibrillation

So long as the operation was indicated on other grounds, we have disregarded auricular fibrillation entirely in selecting our cases. Indeed, fibrillation offers the advantage of a heart rate controlled by digitalis, whereas in normal rhythm tachycardia may be uncontrollable. In so far as fibrillation is commoner in the advanced than in the early stages of the disease, so those with fibrillation are more often unsuitable for valvotomy than those with regular rhythm. For the same reason the operative mortality would be expected to be higher amongst the fibrillators. Of the entire series of 150 patients, 41% had auricular fibrillation, including three of the four patients who died at operation or within four days of it. Four fatalities occurred later; one of these was fibrillating at the time of operation and three were in sinus rhythm. Otherwise the functional results were as good in those with fibrillation as in those with sinus rhythm.

During the actual valvotomy, bizarre auricular and ventricular arrhythmias were recorded as often in sinus rhythm as in auricular fibrillation.

Auricular fibrillation developed within one to three days of operation in 13 out of 48 patients in sinus rhythm who were operated on at the Middlesex Hospital. In anticipation of this, pre-operative digitalization was carried out as a routine in all cases irrespective of rhythm. In three instances the arrhythmia was related to a small area of pulmonary atelectasis, and sinus rhythm returned promptly when the lung re-expanded. A fourth patient reverted spontaneously before quinidine was given. In seven of the remaining nine cases quinidine restored sinus rhythm, usually after 10 to 15 gr. (0.65 to 1 g.) by mouth; the largest daily dose needed was 30 gr. (2 g.). Post-operative auricular fibrillation was irreversible in two patients. In addition, we have encountered one instance of established auricular fibrillation initiated by cardiac catheterization. Heparin

TABLE III.—Mitral Valvotomy: Results in Patients with Highest and Lowest Pulmonary Arterial Pressures

Series No. of Patient	Mean Pressure (mm. Hg)		Resistance (Dynes/sec./cm. ²)		Result
	Pul. Art.	Pul. Capill.	Total Pul.	Pul. Arteriole	
9	80	—	2,000	—	Good
1	73	—	2,336	—	"
34	65	30	1,304	704	"
5	64	25	—	—	"
53	60	32	—	—	"
18	59	—	2,048	—	"
21	32	21	640	216	"
19	29	—	208	—	"
44	23	—	376	656	"
32	22	19	336	92	"
51	20	18	664	264	"
26	17	8	416	216	"

was given before and during quinidine therapy in two cases, but it is not used as a routine. There has been no instance of embolism related to quinidine therapy. Attempts to abolish post-operative fibrillation with quinidine during the first 10 days after operation were unsatisfactory and resulted in sinus rhythm vacillating with fibrillation. Quinidine is more likely to restore permanent sinus rhythm after the fourteenth day. When auricular fibrillation was established before operation we did not attempt to abolish it, and we have not encountered spontaneous reversion to normal rhythm in such cases.

Embolism

There was a history of embolism in 14 (9%) of the entire series of 150 cases. At operation a thrombus in the left auricle was encountered in only one of these cases (No. 22—auricular fibrillation); an old adherent clot was dissected away from the appendix with some difficulty. The patient died 12 hours after operation from cerebral embolism. In another case a fatal pulmonary embolism occurred one month after operation.

Post-operative embolism occurred altogether in nine patients; the details are set down in Table IV. Left auricular thrombi were noted at operation in 14 cases; in 11 of these the thrombus was in the appendix and in three in the body of the auricle.

TABLE IV.—*Mitral Valvotomy: Details of Post-operative Emboli in Nine Patients*

Case No.	History of Previous Embolus	Clot in Left Auricle	Site of Post-op. Embolus	Rhythm	Interval after Op.	Clinical Course
17	Yes	No	Pulmonary (multiple)	Recent auric. fib.	1 month	Died
22	"	Yes—in appendix	Cerebral	Auric. fib.	During operation	Died 12 hours later
42	No	No	Pulmonary (multiple)	" "	2 months	Died 5 months after op.
J.O. 46	"	?	Cerebral	Sinus	1 month During operation	Died
60	"	"	Cerebral popliteal	Auric. fib.	"	Permanent hemiplegia
58	"	"	Cerebral	Sinus	"	Recovery
62	"	"	Renal	Auric. fib.	3 days During operation	Permanent hemiplegia
87	"	"	Cerebral	Auric. fib.	"	"

Two patients (Cases 17 and 42) died some months after operation from multiple pulmonary emboli under circumstances which deserve comment. In both patients the operation was technically satisfactory and a good result was anticipated on discharge from hospital. One and three months respectively after operation, during unusually severe foggy weather, they developed bronchitis and rapid auricular fibrillation, complicated by phlebothrombosis of the legs and repeated pulmonary emboli; both developed intractable cardiac failure. The third patient encountered a similar train of misfortunes one month after operation. Death in these three cases followed massive pulmonary embolism. Since this experience we have taken special care to warn the practitioner of the dangers of bronchitis complicating the early post-operative period and of the importance of detecting and treating phlebothrombosis in such patients.

Congestive Cardiac Failure

Congestive (right ventricular) failure had been present at one time or another in 29 of the complete series of 150 patients. Operation was undertaken in these cases only after long deliberation, since factors other than mitral stenosis, such as myocardial damage, might have contributed to the failure to a predominant degree. The majority of them responded favourably to medical treatment, but in a minority (class III) failure was recurrent or a state of borderline failure persisted. The deciding factors in favour of valvotomy were unquestionable signs of a diaphragmatic valve.

The Middlesex Hospital series of 87 cases included 19 with a history of right ventricular failure in whom valvotomy was deemed worth while. In eight of them failure had been related to the onset of auricular fibrillation or an intercurrent lung infection. When the exciting cause was treated the signs of failure disappeared and the heart became smaller, so that these patients were then included in classes I or II. The remaining 11 belonged to class III.

Three of the 19 patients died, one at operation from a tear of the auricular wall and two within a few days of operation. The result of valvotomy was good in four patients and poor in three. The remaining nine have been operated on within the past few months; all have survived, but the interval is too short to allow evaluation of the results. In a few cases the venous pressure increased and oedema developed within 10 days of operation. No cause was discovered, and the signs of failure disappeared spontaneously.

Calcification of the Mitral Valve

A grossly calcified mitral valve is likely to be rigid and is often incompetent. Yet the signs of a pliant diaphragmatic valve may exist with calcification which stands out conspicuously on radioscopy. Calcification was obvious in 9 of the 87 patients treated at the Middlesex Hospital. Small flecks of calcium perceived only after long scrutiny were disregarded. In one instance of gross calcification it appeared that valvotomy would be impossible; yet, because the signs of an operable valve were present, operation was proceeded with. Massive calcification involved the valve ring and invaded the cusps, which, however, were mobile. The commissures were split with ease and the functional result has been gratifying.

In addition to the nine instances of calcification discovered by radioscopy, a further 18 of varying degree were noted at operation, making a total of 27, or 31% of the Middlesex Hospital series. So far calcification by itself has not prevented operation, although often a knife had to be used to split the commissures. Emboli occurred in two of these cases; in one, transient hemiplegia developed after successful splitting of a slightly calcified valve; in the other it followed unsatisfactory widening of a heavily calcified valve.

Associated Valvular Disease

Mitral Incompetence.—Free mitral regurgitation is almost always a contraindication to valvotomy, but we believe that serious incompetence is incompatible with severe stenosis presenting signs of a pliant diaphragmatic valve. In such cases a systolic murmur may be ignored unless there is left ventricular enlargement. Expansile pulsation of the left auricle visible in the anterior view on radioscopy, and evident on both right and left heart borders should be taken as evidence of significant mitral incompetence. We have seldom found the diagnosis of mitral incompetence a difficult problem except in cases with gross right ventricular enlargement as already discussed.

Aortic Valve Disease.—In the presence of signs of tight mitral stenosis, we have ignored slight and occasional moderate aortic valve disease. One-third of the Middlesex Hospital cases had aortic incompetence and three of the also had aortic stenosis. However, mitral stenosis was always the dominant lesion. Free aortic incompetence with a thrusting apex beat, a jerky pulse, and left ventricular enlargement contraindicates mitral valvotomy. The result has been good in 15 of the 24 patients with slight aortic incompetence and fair in seven; two have died.

Tricuspid Valve Disease.—The possibility of organic tricuspid disease must always be considered when the right ventricle is greatly enlarged. It should be suspected when the signs of tricuspid regurgitation occur in the absence of congestive failure, when there is a noticeable tricuspid systolic murmur or thrill, and when the right auricle is unduly large. Tricuspid stenosis may sometimes be demonstrated by cardiac catheterization. The absence of pulm-

any congestion and relative freedom from dyspnoea and orthopnoea, in the presence of gross right-sided cardiac enlargement, especially if associated with liver swelling and ascites, is characteristic of tricuspid disease. We have regarded this condition as a contraindication to valvotomy. One patient with proved tricuspid stenosis and incompetence was submitted to mitral valvotomy on grounds of her hopeless disability and at her express wish, but unfortunately she died from post-operative embolism, so that the experiment was inconclusive. Functional tricuspid incompetence which disappears when failure responds to treatment is no bar to operation.

Pulmonary Complications

When mitral stenosis is complicated by chronic bronchitis and emphysema it is difficult to decide whether the symptoms are mainly cardiac or pulmonary, and long and careful observation may be necessary. We have performed mitral valvotomy on nine patients with well-marked chronic bronchitis and emphysema; the result was good in two and fair or poor in four. Two died and one case has not been followed up. Two out of three patients with extensive pulmonary haemosiderosis have done well after operation, and the radiological appearance of the lungs has shown a tendency to improve.

Pregnancy

Valvotomy was successfully performed during pregnancy in two patients who developed repetitive paroxysms of pulmonary oedema starting at the third and fourth months. The operation was done in one case at the fourth month, and in the other at the 32nd week, shortly after the patient first came under our care. Great improvement resulted and pregnancy continued normally to term.

Acute pulmonary oedema complicating mitral stenosis is the most important cardiac cause of death actually during pregnancy, and when it occurs after the third month a situation of the utmost gravity arises. Digitalis and other medical measures are unlikely to prevent a recurrence of the attacks if pregnancy continues, so that the choice lies between mitral valvotomy and termination of pregnancy by abdominal hysterotomy. Valvotomy has the double advantage of affording immediate relief to the underlying cause of the pulmonary oedema and of a good chance of preserving the life of the child. Late in pregnancy, however, it must carry a risk of precipitating premature labour in the post-operative period.

We have little doubt that immediate valvotomy is the method of choice in dealing with the emergency which arises when a patient with mitral stenosis develops pulmonary oedema after the third month of pregnancy. This does not imply that, in general, valvotomy renders those with severe mitral stenosis capable of undergoing pregnancy with safety, or that we should encourage such a belief in these patients.

Contraindications to Mitral Valvotomy

The current contraindications, in summary, are as follows:

Age.—Few patients under the age of 20 present with the indications for valvotomy. Because of the danger of activating the rheumatic state, operation should be postponed in these cases unless the symptoms compel immediate surgical relief. We have generally regarded 50 as the upper limit, although six of our patients had passed this age.

Acute Rheumatism.—We have never attempted valvotomy if clinical evidence of acute carditis was present.

Associated Valve Disease.—Predominant aortic valve disease, free mitral incompetence with left ventricular enlargement, and organic tricuspid disease are contraindications to valvotomy.

Myocardial Damage.—This is assessed from the size of the heart and the presence or absence of congestive failure. Gross right ventricular enlargement is a relative contraindication and gross left ventricular enlargement an absolute contraindication to valvotomy. One of our patients who had a coronary occlusion and left bundle-branch block in the electrocardiogram was nevertheless operated on successfully and with benefit.

Pulmonary Disease.—Severe emphysema, chronic bronchitis, and bronchiectasis have proved to be unfavourable.

Congestive Cardiac Failure.—If right ventricular failure cannot be relieved by treatment, mitral valvotomy is unlikely to be successful.

Giant Left Auricle.—Aneurysmal dilatation of the left auricle is often associated with mitral incompetence and with pericardial adhesions. In spite of the huge size of the heart, these patients may remain free from congestive failure for years on digitalis, and their disability is often far less than in cases of severe mitral stenosis with smaller hearts. Valvotomy is contraindicated in such cases.

Anaesthesia for Mitral Valvotomy

Non-explosive agents have been used throughout. Induction and intubation are performed with minimal doses of thiopentone and curare, after which narcosis is maintained by endotracheal gas-oxygen. Approximately 1 g. of procaine hydrochloride in saline is given over the period of an hour by intravenous drip. Topical local analgesic agents are not used. Further small doses of barbiturate and curare are added as required.

Cardiac irregularities of serious import were uncommon and demanded urgent attention on only two occasions. Continuous electrocardiograms, which were taken in the first 30 cases, are now recorded only for special reasons.

Technique of Mitral Valvotomy

The postero-lateral fifth-rib incision is preferred to the antero-lateral, the patient being tilted somewhat towards the supine position. The pericardium is freely opened parallel to the phrenic nerve to expose the lateral aspect of the heart.

Direct auscultation of the heart is carried out with a sterile stethoscope. The auricle and its appendix are gently palpated for thrombi, and if these are absent a light clamp is placed across the base of the appendix. Then, without using any sutures, the tip of the appendix is cut off and the incision enlarged to leave an opening one and a half times the diameter of the surgeon's index finger.

As the clamp is removed the finger is inserted gently. Sometimes the isthmus between the appendix and body of the auricle is unduly narrow and has to be stretched gradually. With the finger now well in the auricle, the tip can be swept over the aortic cusp and carried laterally until the roughened edges of the stenosis are felt. More posteriorly and laterally the wide mouth of the pulmonary vein can be identified. Attention is paid to the following points: ballooning of the antero-medial mitral cusp in ventricular systole, the size of the stenotic opening, the presence of calcification, and the existence of a regurgitant jet.

The actual valvotomy has often been described; it consists in engaging the side of the finger-tip in the opening and trying to fracture the commissures antero-laterally and postero-medially as far as the valve ring, a structure whose presence is inferred rather than felt (Fig. 5).

With the diaphragmatic type of valve, the posterior commissure, which is usually shorter, should be ruptured first; if the anterior commissure is split first, the resulting loss of tension makes the posterior commissure more difficult to deal with. When both commissures have been split (and considerable force may have to be used) the valve cusps are palpated for mobility, the finger is passed down the fan of the chordae tendineae on to the papillary muscles to exclude any cross-fusion, and, finally, a regurgitant jet is again sought for.

The finger is then withdrawn as the auricular clamp is reapplied, and the incision sutured with fine thread. The heart is auscultated again. The pericardium is loosely closed after flushing out with saline, and the chest closed. Temporary water-seal drainage of the chest is maintained for 24 to 48 hours to avoid the effects of a sudden accumulation of pleural fluid.

Matters are not always so straightforward, and the following complications may be encountered:

Auricular Thrombosis.—The incidence of thrombosis in the left auricle or its appendix in this series was 9%. Great caution should be exercised if the auricle does not pulsate and clot is felt within it. The tip of the appendix can be incised and the resultant gush of blood may sweep out a recent clot. Organized clot may be dissected out of the appendix if a light clamp is applied to the base. The danger lies in separating a piece of organized clot as the clamp is applied. If the thrombus is firmly attached, the operating finger may be worked carefully around without disturbing it. A small or thrombosed appendix or a thrombosed auricle may preclude the normal entry, and, if so, access may be gained through the pulmonary vein. The distal branches are held in check ligatures while a clamp is placed at the base of the vein. An oblique incision over the main trunk allows the finger to be introduced, and at the com-

plete of the operation simple suture is used to close the incised vein. In one case the auricular thrombosis was so extensive that it was impossible to introduce a finger or instrument into the heart. The pulmonary vein was too small, and direct incision through the auricular wall showed a thick layer of clot which could not be penetrated.

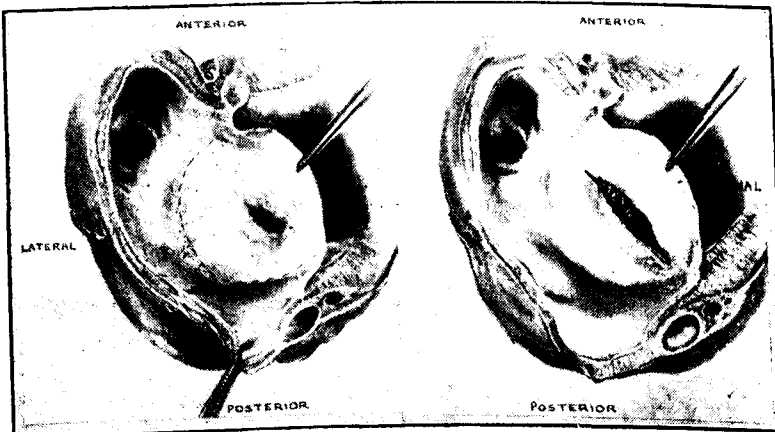


FIG. 5.—Necropsy specimen of mitral stenosis after valvotomy with (left) assumed appearance before operation. The patient (J. O.) died one month after operation from multiple pulmonary emboli.

Embolism.—The separation of clot or calcified fragments may produce embolism in the cerebral vessels, but this is seldom recognized until the patient recovers consciousness. Where a thrombus is palpable in the auricle, the anaesthetist compresses the carotid arteries in the neck during the actual valvotomy. This temporarily arrests the flow into these vessels, and any emboli may be swept along with the active blood flow and avoid the brain. This method is more simple than temporary occlusion of the innominate and left carotid arteries within the thorax.

Tearing of the Auricle.—The incision in the appendix sometimes splits, particularly if the auricular wall is thin. This should be recognized before the finger is withdrawn, as it permits insertion of control sutures before the clamp is applied. The loss of blood from an unsuspected tear can be catastrophic.

Rigidity of the Stenosis.—The finger may fail to rupture the commissure despite the application of considerable force; if so, the greatest care must be exercised to avoid tearing into the aortic cusp or pulling off a papillary muscle. Either of these events may produce a severe regurgitation. If the finger fails, a knife-like instrument attached to the finger can be used, care being taken to avoid injury to surrounding structures.

Haemorrhage.—In a straightforward operation the loss of blood does not exceed 1–2 oz. (28–57 ml.). If much manipulation is required or if the auricular wall is torn, urgent measures are necessary to replace the blood loss. A

Influence of Technical Result of Operation on Functional Result

An assessment has been made of the technical result of each valvotomy performed. When free splitting of the commissures was achieved without producing incompetence, 84% of the patients obtained a good functional result, compared with only 46% when the valvotomy was less complete. If the tiny slit of the stenosis is enlarged even by a few square millimetres, the volume of blood passing through the valve may be considerably increased. This may account for the early benefit experienced by certain patients in whom the technical result of the operation was poor in so far as the commissures were split to only a limited degree or a funnel-shaped valve could be merely dilated by the finger.

Summary and Conclusions

The basic indication for mitral valvotomy is disability from mitral stenosis of an anatomical form which is amenable to surgical correction. This type of stenosis, in which there is a *pliable diaphragmatic valve*, gives rise to characteristic clinical signs by which it may be recognized and which are described.

The most important consequence of pulmonary hypertension is right ventricular enlargement, and the size of the right ventricle, as determined by clinical radiological, and electrocardiographic findings, provides a more valuable index to the degree of pathological change

due to mitral stenosis than does the level of the pulmonary arterial pressure at a given moment. Cardiac catheterization is no longer required as a routine measure in the selection of cases suitable for mitral valvotomy. Selection may now be made on a basis of the symptoms and of the data provided by routine cardiologic examination.

Mitral valvotomy has been performed on 150 patients of whom 31 were men and 119 women. Their ages ranged from 19 to 57 years. Four patients died as direct result of the operation, an immediate mortality of 2.7%. Four died from various causes some time after the operation.

The results in 111 patients followed up for five months to two and a half years have been good in 74% and only fair or poor in 20%. Patients with auricular fibrillation (41% of the series) did as well as those with sinus rhythm, but three of the four operative fatalities were in fibrillation.

Cases selected for operation on grounds of an operable valve were classified according to the size of the right ventricle and the presence of congestive failure. Patients with large hearts, and congestive failure who failed to respond to treatment, benefited least from valvotomy. When free splitting of the commissures was achieved, 84% of the patients obtained good symptomatic relief, whereas when valvotomy was judged to be less satisfactory only 46% of the patients obtained relief. Nevertheless, partial splitting of the valve does not preclude satisfactory clinical improvement.

Clinical Material

Thirty-six cases of bronchiectasis in all, aged 3 to 15 years, have been treated with chloramphenicol. Judged by the quantity of sputum obtained while the patients were being treated by physiotherapy, 22 were severe and 14 were mild cases. Fifteen cases were able to produce an indefinite amount of sputum, 10 with involvement of at least four lobes. Among eight unilobar cases, only two are included in the severe group.

The first observations concern 15 cases, aged 5 to 10 years, in the Meath School of Recovery at Ottershaw (Invalid Children's Aid Association). In 11 the sputum grew *H. influenzae* alone, and in four *H. influenzae* with pneumococci. All had first been treated by a physiotherapist for many weeks, and eight of the cases could cough up a limitless quantity of purulent sputum at any time during the day. The dose of chloramphenicol was 500 mg. eight-hourly in capsules by mouth, equivalent to between 20 and 30 mg. per lb. (44 and 66 mg. per kg.) body weight daily. The quantity of sputum lessened dramatically, and by the third or fourth day of treatment it became difficult to obtain a specimen; cultures were sterile.* After seven days the drug was stopped in 10 and continued in five of the cases. The mildest case had no more sputum after this week of treatment and remained well and symptom-free for a whole year following discharge home. In the other nine cases sputum cultivated on the sixth day after the end of treatment showed a return of the original organism, while sputum from the five cases still under treatment remained sterile in four and grew pneumococci in one. Two cases continued treatment at half the original dose for two further weeks, the sputum remaining sterile, while two very severe cases, treated on half the original dose for five and six months, later increased the quantity of sputum to 1 to 1 oz. (14 to 28 ml.) daily (compared with 6 to 8 oz. (170 to 230 ml.) collected easily before treatment) and the sputa grew bacteria from time to time, but never *H. influenzae*. In all the severe cases *H. influenzae* regained its ascendancy in the sputum within 10 days of the end of treatment, though cough and the quantity of sputum were less than before treatment began.

Three cases had 250 mg. of chloramphenicol twice a day for one, two, and five months (approximately 10 mg. per lb. (22 mg. per kg.) daily), and pneumococci, streptococci, and staphylococci appeared from time to time without *H. influenzae*. In seven cases three doses of 250 mg. eight-hourly for one day of each week were given for one month in one case, for three months in five cases, and for five months in one case (12 to 24 mg. per lb.: 26 to 53 mg. per kg.). Cultures of sputum were sterile on the day after treatment, but grew various bacteria, including *H. influenzae*, by the sixth day, so that weekly treatment failed to produce constant sterility of the sputum. Assessment of the 15 cases one year after starting treatment showed a maintained improvement in seven; two are somewhat better, and in the six clinically most severe cases lessening of the sputum occurred only while chloramphenicol was actually being given.

A second observation at the Meath Home concerned eight patients from 3 to 8 years old. Six sputa grew *H. influenzae* and one sputum grew *H. influenzae* with *N. catarrhalis*. In one case there was a pure growth of pneumococci, and this is the only case in the study from whose sputum *H. influenzae* was not grown. Six cases were given 250 mg. eight-hourly for 18 days (13 to 21 mg. per lb. (29 to 46 mg. per kg.) daily). On this dose, two-thirds of that given in the previous test, there was the same dramatic change in the quantity and character of the sputum from the third or fourth day, with the same return of organisms within a few days of the end of treatment. Sputum from

*This term is used for the sake of brevity to describe cultures containing no colonies of any pathogen and very few colonies of commensals.

Good results were obtained alike in those with greatly elevated pulmonary arterial pressures and in those with a slight or moderate elevation.

The following are regarded as contraindications to operation: active rheumatic carditis, severe myocardial damage as revealed by gross right ventricular enlargement and intractable congestive failure, predominant aortic valve disease, organic tricuspid valve disease, mitral incompetence associated with left ventricular enlargement, and a giant left auricle. Chronic bronchitis, emphysema, and other pulmonary complications prejudice the success of the operation.

The technical details of mitral valvotomy and the operative complications are briefly described.

We wish to thank many colleagues in hospital and in practice, particularly Dr. K. Shirley Smith and others at the London Chest Hospital, who have kindly referred patients needing valvotomy. We are especially indebted to Mr. J. R. Belcher, who has taken an active part in the surgical management of the Middlesex Hospital patients.

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CHLORAMPHENICOL TREATMENT OF BRONCHIECTASIS IN CHILDREN

BY

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Although most acute bacterial infections are now readily amenable to chemotherapy the problem of chronic infection based on structural changes remains unsolved. Whatever the prime cause or causes of bronchiectasis, the main symptoms in childhood result from chronic or recurrent infection of damaged lung. The damage is almost certainly permanent, yet follow-up studies suggest that the infection, as evidenced by clinical signs and symptoms, may die out towards adolescence. Cultures of sputum show the frequency of infection with *H. influenzae*, and, as this is an organism highly susceptible to chloramphenicol, a study has been made of the effect of this drug on the course of bronchiectasis. The study has been brought to an end by the recognition of the possible dangerous action of chloramphenicol on bone marrow. Sufficient knowledge had already been gathered to shed light on two problems—the nature of the infection, and the response, bacteriological and clinical, to chemotherapy; and these observations are reported here.

four of the cases given the same daily dose twice a week was not kept sterile.

Only two children, both with extremely severe symptoms, aged 3½ and 4 years, were given chloramphenicol palmitate, at first in doses of 12 and later of 24 mg. per lb. (26 and 53 mg. per kg.) daily, but the sputum failed to lessen in quantity or to become sterile in either. The death of one of these patients is referred to later.

Thirteen other cases of bronchiectasis have been treated with chloramphenicol capsules by mouth in the wards of St. Bartholomew's Hospital and Osterhills Hospital, St. Albans. Ages ranged from 4 to 15 years, eight cases being severe and five mild. Again *H. influenzae* was the predominant and usually the only organism cultivated from the sputum, and again daily doses of 12 to 15 mg. per lb. (26 to 33 mg. per kg.) sterilized the sputum in three or four days, with the same recurrence after treatment, the more rapidly the severer the case. The five mild cases have been treated periodically with one or two weeks of chloramphenicol—20 mg. per lb. (44 mg. per kg.) daily divided into three doses—particularly at the time of any acute respiratory symptoms; and under this regime school life and health have been little upset.

The following laboratory data are based on findings in 27 of the cases here described, examination in the remainder not having been performed by one of us (L. P. G.).

Sputum Findings

The characters of the sputum in these patients were strikingly uniform. It consisted of thick yellow odourless mucus. Except in the one case, already noted, which had a pure pneumococcus infection, a stained film invariably showed large numbers of minute Gram-negative rods, and culture gave a growth consisting almost entirely of *H. influenzae*. The only other identifiable pathogen in the sputum of untreated cases was *Str. pneumoniae*: this was found in 10 cases, but in relatively very small numbers.

Sensitivity to Antibiotics of Strains of *H. influenzae* from Cases of Bronchiectasis

Antibiotic	Total No. of Strains	Minimum Inhibitory Concentrations (µg./ml.)					
		0.25	0.5	1	2	4	8
Chloramphenicol ..	37*	2	16	19			
Penicillin ..	22		2	15	3	1	1
Streptomycin ..	22			3	2	16	
Aureomycin ..	22	2	3	17			
Terramycin ..	22	1	8	13			

Figures are numbers of strains inhibited by each concentration.
* Includes 10 strains from similar but untreated cases.

The sensitivity of the strains of *H. influenzae* to chloramphenicol and other antibiotics is stated in the Table. These determinations were made by incorporating the antibiotic in falling dilutions (two-fold differences) in plates of heated blood agar, the surface of which was inoculated with a small loopful of heated blood-broth culture, diluted approximately 1:500, in each of eight areas—that is, eight strains per plate were tested. The concentrations stated are those completely inhibiting growth after 24 hours: the next lower always showed diminished growth and the next full growth. All the strains tested were inhibited by 1 µg./ml., 16 by 0.5 µg./ml., and 2 by 0.25 µg./ml. of chloramphenicol.

The further tests with other antibiotics were done later with 22 strains which had been preserved in the dried state, the same method being used.

The sputum of patients under adequate treatment with chloramphenicol was distinguishable at a glance from a pre-treatment specimen. It was white in colour and less cellular, contained no *H. influenzae*, and at first yielded no significant growth. Two other species tended to appear during treatment: *Str. pneumoniae* (in 11 patients), which was

shown in three patients whose sputum had originally contained it in small numbers to have diminished in its sensitivity to chloramphenicol; and a chloramphenicol-resistant *Staph. pyogenes*. Sputum containing these organisms became more cellular, but in neither purulence nor quantity did it attain the characters of pre-treatment sputum.

Estimations of Drug in Sputum.—A method for this was devised, depending on two convenient facts: that chloramphenicol is heat-stable, and that the air passages and mouth usually contain no sporogenous or other heat-resistant bacteria. Specimens were accordingly placed in a water-bath at 60° C. for one and a half hours, then diluted 2-, 4-, 8-, and 16-fold in heated blood broth, and inoculated with *H. influenzae* itself. The organism grew well in all dilutions of control tests with non-drug-containing sputum, and was inhibited to the expected dilution in control tests in which chloramphenicol had been added. Whether the inoculum had multiplied was determined by plating after one day's incubation.

The results of such tests in 15 specimens showed the presence of 8 µg./ml. chloramphenicol in five and 4 µg./ml. in six who were receiving chloramphenicol, and less than 2 µg./ml. in four specimens from two patients receiving chloramphenicol palmitate, in whom this compound had failed to eliminate *H. influenzae* from the sputum.

Acquired Bacterial Resistance

Habituation to chloramphenicol was attempted *in vitro* by repeated transfers in heated blood broth containing increasing concentrations. Of three strains of *H. influenzae*, two showed a fourfold and one a twofold increase after five transfers. Of three strains of *Str. pneumoniae* two showed a fourfold increase and one no change after 10 transfers. Each of three strains of *Staph. pyogenes* underwent a fourfold increase in resistance in 10 transfers.

Acquired resistance *in vivo* was observed with three strains of *Str. pneumoniae*, the difference being fourfold in each case (inhibitory concentration increasing from 2.5 to 10 µg./ml.), and in three strains of *H. influenzae*, originally inhibited by 0.25, 0.5, and 0.5 µg./ml., and found after treatment in each case to require 2.0 µg./ml. One of these patients was given diminishing doses, which eventually failed to suppress the infection, and two were treated with chloramphenicol palmitate, which also failed to eliminate the organism. There is thus some suggestion that inadequate treatment tends to encourage the acquisition of bacterial resistance.

Toxic Effects

One patient, a female aged 4 years, was given 125 mg. of chloramphenicol palmitate three times a day for 20 days, followed by 250 mg. thrice daily for 29 days (total, 29.25 g.). Pallor was noted at the end of this course: eight days later there was generalized purpura. Despite vigorous treatment she died with multiple haemorrhages and an aplastic marrow 26 days after the appearance of purpura. (We are permitted by our colleague, Professor R. V. Christie, to mention that an aplastic anaemia also developed in a man under his care who had had prolonged chloramphenicol treatment for *H. influenzae* bronchitis: this patient, after many transfusions, is apparently recovering.)

Discussion

The effects of chloramphenicol when 20 mg. per lb. (44 mg. per kg.) is given by mouth daily, divided into three doses, is consistently to diminish the quantity of sputum and to sterilize it in three or four days. Continued treatment may be accompanied by a later increase in the quantity of mucoid sputum up to 2–3 oz. (57–85 ml.) daily despite the absence of pus and bacteria. The abnormal physical signs characteristic of active infection persist even when sputum disappears altogether. Bacteria reappear when the dose drops below 20 mg. per lb. per day or is

THE IN-VITRO SENSITIVITY OF *H. INFLUENZAE* TO FIVE DIFFERENT ANTIBIOTICS

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At times clinicians find it difficult to select and bacteriologists to suggest the antibiotic most effective in some of the less common bacterial infections until detailed sensitivity tests have been carried out, with the result that there is a delay of at least 24 hours in administering the one regarded as most suitable.

This situation occurs particularly often in infections due to *Haemophilus influenzae* (Mulder, 1952). This organism causes both acute infections—for example, meningitis, obstructive laryngo-tracheobronchitis, pneumonia, empyema (Rivers, 1922; Alexander, 1943; Zinnemann, 1947), and also chronic infections with acute exacerbations, such as otitis, sinusitis, and bronchiectasis (Hirsch, 1912; Mulder, 1940; Allison, J. Gordon, and Zinnemann, 1943; Bjuggren and Tunevall, 1952; Tunevall, 1952). It is sensitive in some degree to all antibiotics easily available in this country (M. Gordon and Zinnemann, 1945; Hewitt and Pittman, 1946; Alexander, Leidy, and Redman, 1949).

Few comparative assessments of the more recent antibiotic drugs against *H. influenzae* have been made, and these mostly on a small number of strains (Alexander *et al.*, 1949; Long *et al.*, 1950; McCrumb *et al.*, 1951; Schoenbach *et al.*, 1952). Recently two larger series have been published (Mulder *et al.*, 1952; Tunevall, 1951): see Table I. Mulder *et al.* recorded only the

TABLE I.—Minimum Inhibitory Concentrations of Antibiotics for *H. influenzae*, Expressed in µg. per ml. of Medium *in vitro*, as Determined by Various Authors

Authors	Penicillin	Streptomycin	Aureomycin	Chloramphenicol	Terramycin	Total No. of Strains Tested
Alexander <i>et al.</i> (1949) ..	N.T.	1–3	0.5–1	1	N.T.	?
Long <i>et al.</i> (1950) ..	..	1–25	0.625–2.5	N.T.	2.5	2 (C)
McCrumb <i>et al.</i> (1951) ..	0.8–10	0.8–10	0.4–10	0.4–5	1.7–2.5	16 (C)
Schoenbach <i>et al.</i> (1952) ..	0.156–10	1.56–3.1	0.156–2.5	0.156–5	0.156–5	22 (C)
Mulder <i>et al.</i> (1952) ..	0.35–2.8*	0.5–8	N.T.	0.25–3	3–8	14–187 (N)
Tunevall (1952)	0.35–2.8*	0.25–4	0.063–0.5	0.063–0.5	0.063–0.5	21 (C) 42 (N)

N.T. = Not tested. (C) = Capsulated strains. (N) = Non-capsulated strains.
* Figure arrived at by conversion of Oxford units to micrograms.
† Author records number of strains and percentages inhibited by serial twofold dilutions within the limits quoted in this table.

upper and lower limits of the minimal *in-vitro* inhibiting doses for *H. influenzae* as did all authors quoted above, with the exception of Tunevall, whose findings will be discussed in detail later. The results obtained have not led any of the authors to make specific recommendations for the choice of an antibiotic drug in *H. influenzae* infections. The figures of Mulder *et al.*, however, are slightly favourable to chloramphenicol, whereas those of Tunevall suggest aureomycin.

During our routine determinations of the sensitivity of *H. influenzae* strains to antibiotics the impression was

given less often than eight-hourly. Pneumococci and staphylococci seem to reappear during long courses of treatment, but not to persist. In most cases, once the *H. influenzae* returns the other invading bacteria quickly die out. Mild and unilobar cases may remain symptom-free for many months after a course of two weeks' treatment (eight cases). Severe cases have always relapsed within 10 days of ceasing treatment, and sometimes the relapse is heralded by an acute febrile illness lasting one or two days. In every case another course of treatment has produced another remission. The question arises whether in severe cases the *H. influenzae* remains deep in the tissues of the bronchiectatic lung, ready to reappear in the sputum when the drug is stopped, or whether reinfection occurs. The larger doses that might reduce the risk of relapse on the first hypothesis have not been regarded as safe in these observations.

Unfortunately the possibly toxic effect of chloramphenicol on bone marrow, responsible for one death in the cases treated in this series, makes the prolonged use of the drug unwise. Some of the cases reported here have taken as much as 100 g. in six months without apparent ill effect, and repeated blood examinations might give warning of trouble in time for the drug to be stopped, before changes in the marrow become irreversible. We do not, however, intend to persist with this treatment. We feel that our results must be recorded to show that there is a place—if now vacant—in the medical treatment of bronchiectasis in children for an antibiotic sharing with chloramphenicol the power of rapidly reaching a high enough concentration in the respiratory tract to destroy *H. influenzae* without inducing resistance, so that recurrent infection may be successfully treated in the same way. Such a drug would combine safety with the power to dry up sputum and to make bacteriologically safe surgical procedures on lower respiratory tract or on upper respiratory tract, so often the site of disease causing persistence of symptoms; secondly, would be suitable for routine preventive treatment in severe bronchopneumonia in infancy, especially in association with pink disease and whooping-cough; thirdly, would keep the mild unilobar case free from recurrences following intercurrent influenza or other acute respiratory infections; and, fourthly, would give periods at least of freedom from endless cough and sputum in the severest cases where five lobes are diseased in early childhood, and where even the boldest thoracic surgeon must refuse surgical help. For those who believe that *H. influenzae* is responsible for the persistence of symptoms in the majority of cases of bronchiectasis, and that bronchiectasis is a disease with a tendency towards improvement and dying out of symptoms in time, the situation urgently demands a safe antibiotic with the remarkable powers of chloramphenicol. Our experience with aureomycin and terramycin, to which *H. influenzae* is also very sensitive, is so far too limited to justify any report.

Summary

Of 36 cases of bronchiectasis in children a pure or almost pure infection by *H. influenzae* was present in 35.

Chloramphenicol, to which this organism is highly sensitive, invariably produced a remission while being given in adequate doses. After cessation of treatment, severe cases reverted to their original condition, but some milder ones appeared to have received more lasting benefit.

One patient died of aplastic anaemia, an occurrence which led to the abandonment of the treatment.

We are indebted to Miss Pamela M. Waterworth for skilled laboratory assistance, and to Miss Gosling and her staff at the Meath School of Recovery for collecting and personally conveying to London many specimens of sputum.

obtained that chloramphenicol was more effective than the rest. To confirm this impression capsulated and non-capsulated strains of *H. influenzae* isolated from pathological conditions during the period January 1, 1951, to October 30, 1952, and a number of strains of both varieties from similar routine material kindly forwarded by Dr. K. B. Rogers, of the Children's Hospital, Birmingham, were tested by the standard method described below, and the results analysed. The data were collected as strains became available.

Technique.—As soon as possible after isolation the strains were inoculated into Levinthal broth and incubated overnight. Four drops of a 1 in 1,000 nutrient-broth dilution of this culture were spread uniformly over the whole surface of each of three heated horse-blood (chocolate) agar plates. With a sterile cork-borer a number of holes were punched at regular intervals in the medium around the edge of the plates. The holes were filled to within about 1 mm. of the rim with the dilutions of the antibiotic drugs. Penicillin was tested by itself on the first plate; streptomycin was paired with aureomycin on the second, and chloramphenicol with terramycin on the third plate. The standard dilutions of antibiotics employed were 1 µg., 2 µg., 5 µg., and 10 µg., except for penicillin. Of the last-named drug 1, 2, 5, and 10 Oxford units (corresponding to 0.61, 1.22, 3.05, and 6.1 µg.) were used. After overnight incubation the plates were read and the results recorded.

Definitions.—Some investigators have based their readings on partial, others on complete inhibition (Jackson and Finland, 1951). Results of the two methods arrive at different values. To facilitate comparison with the findings of other workers the results for both methods of reading are given in Tables IV and V. In this investigation the term "partial inhibition" is not based on any measurements of the width of inhibition zones but indicates a marked zone of inhibition of growth around the punch-holes with slight growth still occurring inside the zones and right up to the edge of the punch-holes. The term "complete inhibition" indicates complete absence of growth within the whole or part of the inhibition zone.

Results

A total of 34 capsulated and 50 non-capsulated strains of *H. influenzae* were investigated. All these strains were isolated from cases in which *H. influenzae* was present as the only or predominant bacterium and in which it appeared that the

TABLE II.—Distribution of 34 Capsulated *H. influenzae* Strains According to Types and to Sites from which Isolated

Site	No. of Type Strains Isolated					
	a	b	c	d	e	f
Cerebrospinal fluid	0	21	0	0	0	0
Blood culture	0	2	0	0	0	0
Bronchial secretion	0	2	0	0	0	0
Nasopharynx	0	2	1	0	1	0
Sputum	0	0	0	1	0	0
Trachea at necropsy	0	0	0	0	2	0
Ankle-joint	0	1	0	0	0	0
Conjunctival sac	0	1	0	0	0	0
Total	0	29	1	1	3	0

TABLE III.—Distribution of 50 Non-capsulated *H. influenzae* Strains According to Sites from which Isolated

Site	No. of Strains Isolated
Blood culture	3
Bronchial secretion	9
Sputum	3
Throat	8
Nose	4
Nasopharynx	6
Antrum	6
Ear	3
Conjunctival sac	5
Pleural cavity (empyema)	3
Total	50

clinical conditions were related to or aggravated by this organism. Tables II and III give details of the sites from which the strains were isolated and the number of strains isolated from these sites. As was to be expected, the majority of capsulated *H. influenzae* strains were obtained from the cerebrospinal fluid of cases of meningitis in children, and all 21 strains from this site were of type b (Pittman). The possible sources of non-capsulated strains are fairly well represented by the 50 strains investigated. All strains may thus be regarded as unselected.

A more exacting test is the *in-vitro* determination of the concentration of any given antibiotic required to inhibit a micro-organism completely. Table IV shows that in such a test 1 unit per ml. of chloramphenicol inhibits completely one-quarter of the capsulated and two-fifths of the non-capsulated *H. influenzae* strains, while all other antibiotics tested inhibit only 6% or less of all the strains. At a concentration of 2 units per ml. chloramphenicol inhibits one-half of the capsulated and over four-fifths of the non-capsulated strains, while none of the other antibiotics inhibits completely more than roughly one-quarter of the capsulated and one-sixth of the non-capsulated strains. All of the capsulated strains, with one exception, and 100% of the non-capsulated strains are completely inhibited by 5 units per ml. of chloramphenicol, while the most effective of the other antibiotics inhibit only three-quarters of the strains at this concentration. The effective concentrations are naturally lower if partial inhibition is used as the basis to assess antibiotic activity (Table V).

Terramycin and penicillin follow chloramphenicol fairly closely in their *in-vitro* performance against *H. influenzae*, and it would be difficult, on the basis of the figures obtained, to decide which of these two drugs is more active. Streptomycin and aureomycin appear to be roughly equal but less inhibitory than terramycin and penicillin, particularly as judged by the partial inhibition test.

Discussion

The superiority of chloramphenicol in inhibiting *H. influenzae in vitro* in these investigations is somewhat surprising in view of the absence of similar statements in the not inconsiderable literature on the drugs tested, although chloramphenicol and aureomycin have now been in use for five and terramycin for three years. Clinically, however, infections due to Gram-negative organisms have been reported to respond better to chloramphenicol (McCrum et al., 1951). Jackson and Finland (1951) drew attention to the fact that determinations of *in-vitro* sensitivity to antibiotics carried out with diverse methods and in the hands of different investigators cannot easily be compared and that the conclusions reached may differ. Such divergencies in tests on *H. influenzae* are shown in Table I. The argument does not seem entirely valid if used against the results reported in this communication, for the following reasons.

Table I, which summarizes the principal papers on the sensitivity of *H. influenzae* to antibiotics, shows that, with the exception of one (Tunevall), the authors have confined themselves to indicating the upper and lower limits of the minimal inhibiting doses of the antibiotics investigated. In the results here reported the figures have been analysed in such a way as to record the number of strains of *H. influenzae* inhibited at four concentrations of five different antibiotics. This method of tabulating results is better suited to stressing the superiority of one or the other of the drugs investigated. Results similar to the one reported here have been obtained by an independent observer (W. Goldie, personal communication, 1952). However, Tunevall (1952) recorded his findings in a way closely resembling the one used in this communication. In Table I there is a suggestion of a slight superiority of aureomycin over chloramphenicol, although in his conclusions the author regards the two drugs as equally effective. The explanation for the divergence between the two sets of experiments may perhaps be found in the different

techniques used, as Jackson and Finland (1951) suggested. Tunevall incorporated the antibiotics in serial twofold dilutions in a solid medium, which was then inoculated with the strains to be tested, while the present findings are based on the punch-plate technique.

As a rule determinations of sensitivity carried out in fluid media or with the antibiotic incorporated in a solid medium tend to give lower values than those obtained with the punch-plate method. It may be inferred from this fact that the actual inhibitory concentrations of all antibiotics tested in the way here described are lower than appears from the findings recorded. However, the order of effectiveness should not be influenced by lower readings.

Ease of administration favours the so-called broad spectrum antibiotics, but side-effects such as gastro-intestinal irritation may sometimes make their administration difficult if not impossible, quite apart from the uncertainty about the doses given if vomiting occurs. In practice, blood concentrations of penicillin high enough to inhibit most or all *H. influenzae* strains are difficult if not impossible to achieve and to maintain, although such concentrations can be obtained easily in the C.S.F. by intrathecal injection. On the other hand, therapeutically effective blood concentrations of the order of 5 to 10 µg. are the rule with usual oral doses of chloramphenicol, aureomycin, and terramycin, or with intramuscular doses of streptomycin (Zintel et al., 1945; Ehrlich, 1947; Dowling et al., 1948; Glazko et al., 1949; Welch, 1950; Eads et al., 1952). It is evident, therefore, that the quite impressive *in-vitro* performance of penicillin is not likely to be equalled by its performance in clinical infections due to *H. influenzae*, except in some conditions, such as meningitis (Zinnemann, 1946) or empyema, where a high concentration of the drug can be applied locally. This circumstance still further emphasizes the value of chloramphenicol in *H. influenzae* infections, with terramycin as a good second best. Aureomycin is a difficult drug to assess in *in-vitro* experiments, as up to 50% of its activity may be lost during incubation at 37° C. (Chandler and Bliss, 1948). It is possible, therefore, that the *in-vitro* activity of aureomycin against *H. influenzae* is greater than is suggested by the *in-vitro* results given in Tables IV and V. However, observations on patients with chronic infec-

tions due to *H. influenzae* (Allibone, 1953, personal communication) seem to agree well with the *in-vitro* results reported here, the order of *in-vitro* effectiveness being chloramphenicol, terramycin, and aureomycin. It must be stressed, though, that *in-vitro* sensitivities to antibiotics do not necessarily permit conclusions on the effectiveness of these drugs *in vivo* in spite of good agreement in this series.

In view of the greater inhibitory action of chloramphenicol on *H. influenzae* it is unfortunate that this drug is claimed to cause aplastic anaemia and related blood dyscrasias (Volini, et al., 1950; Gill, 1950; Smiley et al., 1952). Sturgeon, 1952; Rheingold et al., 1952; Hawkins and Lederer, 1952; Wolman, 1952; Hargraves et al., 1952). Probably no great harm will be done if chloramphenicol is used for one short course of a few days' duration. Repeated or prolonged administration seems to be the common feature of most of the cases of blood dyscrasias reported hitherto, though a few cases have been described with granulocytopenia following one short course of the drug (Gill, 1950; Volini et al., 1950). Hargraves et al. (1952) attribute the deaths from aplastic anaemia of two of the cases reported by them to comparatively small doses of chloramphenicol, but there is an element of doubt in the history of administration of the drug.

Thus it would appear that the antibiotic having the best *in-vitro* and *in-vivo* inhibitory action against *H. influenzae* may have limitations in practical application. More evidence for or against the prolonged or intermittent administration of chloramphenicol is required to assess its value in the therapy of chronic infections due to *H. influenzae*.

Summary

The *in-vitro* antibiotic action of penicillin, streptomycin, aureomycin, chloramphenicol, and terramycin on 34 capsulated and 50 non-capsulated *H. influenzae* strains has been tested at four concentrations. The punch-plate method was used for these sensitivity tests.

Chloramphenicol is the only one of the antibiotics tested which is capable of inhibiting 100% of the strains investigated at the comparatively low concentrations

TABLE IV: COMPLETE INHIBITION.—*In-vitro* Sensitivity of *H. influenzae* Strains to Antibiotics. Punch-plate Method on Heated Blood (Chocolate) Agar Plates; Units/ml.=Oxford Units in the Case of Penicillin and µg. in the Case of All Other Antibiotics

Antibiotic Drug	Capsulated Strains					Non-capsulated Strains				
	No. and Percentage of Strains Inhibited by Units/ml.				Total No. of Strains Tested	No. and Percentage of Strains Inhibited by Units/ml.				Total No. of Strains Tested
	1	2	5	10		1	2	5	10	
Penicillin	0	8 (23.5%)	17 (73.5%)	9 (100%)	34	3 (6%)	3 (12%)	29 (70%)	14 (100%)	50
Streptomycin	0	3 (11.8%)	16 (58.8%)	11 (31.1%)		1 (2%)	7 (16%)	26 (68%)	10 (68%)	
Aureomycin	1 (2.9%)	3 (11.8%)	10 (41.2%)	13 (79.4%)	33	2 (4%)	1 (6%)	17 (40%)	24 (88%)	
Chloramphenicol	8 (23.5%)	9 (50.0%)	16 (97.0%)	1 (100%)		20 (40%)	22 (84%)	8 (100%)	—	
Terramycin	0	1 (3.0%)	23 (72.7%)	7 (21.3%)		1 (2%)	3 (8%)	33 (74%)	12 (100%)	

Figures in parentheses indicate number of strains not inhibited by 10 units/ml. Plain figures indicate absolute number of strains inhibited by a particular concentration of a particular antibiotic; percentage figures indicate proportion of all strains inhibited by a particular concentration of antibiotic drug.

TABLE V: PARTIAL INHIBITION.—*In-vitro* Sensitivity of *H. influenzae* Strains to Antibiotics. Punch-plate Method on Heated Blood (Chocolate) Agar Plates; Units/ml.=Oxford Units in the Case of Penicillin and µg. in the Case of All Other Antibiotics

Antibiotic Drug	Capsulated Strains					Non-capsulated Strains				
	No. and Percentage of Strains Inhibited by Units/ml.				Total No. of Strains Tested	No. and Percentage of Strains Inhibited by Units/ml.				Total No. of Strains Tested
	1	2	5	10		1	2	5	10	
Penicillin	8 (3) (23.5%)	15 (76.5%)	8 (100%)	—	34	5 (1) (3) (10%)	21 (8) (54%)	13 (1) (96%)	1 (100%)	50
Streptomycin	3 (1) (8.8%)	14 (3) (50.0%)	10 (1) (78.4%)	2 (97.0%)		5 (3) (1) (10%)	21 (5) (58%)	9 (1) (86%)	3 (94%)	
Aureomycin	4 (1) (11.8%)	9 (41.2%)	13 (79.4%)	5 (94.1%)	33	3 (2) (6%)	17 (40%)	24 (88%)	5 (98%)	
Chloramphenicol	17 (8) (50.0%)	15 (1) (94.1%)	1 (100%)	—		41 (1) (20) (82%)	8 (100%)	—	—	
Terramycin	2 (1) (6.1%)	18 (4) (60.6%)	7 (93.9%)	2 (100%)		4 (1) (8%)	31 (2) (70%)	12 (98%)	1 (100%)	

Figures in parentheses = number of strains partially not inhibited at given but completely inhibited at next higher concentration. Figures in square brackets = number of strains not tested at < 1 unit/ml. Plain figures indicate absolute number of strains inhibited by a particular concentration of a particular antibiotic; percentage figures indicate proportion of all strains inhibited by a particular concentration of antibiotic.

obtained with the usually recommended therapeutic doses. Terramycin comes next in order of effectiveness, followed by streptomycin and aureomycin. Penicillin *in vitro* is as effective as chloramphenicol and terramycin, or even better, on a weight-for-weight basis, but blood concentrations within the effective range are difficult to obtain and maintain.

Deterioration of aureomycin at 37° C. may be responsible for the comparatively low rating of the drug, but clinical impressions in chronic *H. influenzae* infections also suggest the superiority of chloramphenicol.

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The Home Office has recently issued the report of the Commissioners of Prisons for 1952 (Cmd. 8948). It deals with the administration of prisons; statistics of the prison population; the treatment, training, and after-care of prisoners; Borstal training; detention centres; and the health of prisoners. In spite of the serious overcrowding in the prisons, there was no epidemic of infectious disease last year, and even the usual outbreaks of influenza in the early months were conspicuously absent at most establishments. Indeed, the director of medical services notes, as an interesting observation, that during past influenza epidemics, where three men have shared a cell and one has developed the disease, the infection not infrequently has spread to men in neighbouring cells, while others in the original cell may escape it altogether. However, the potential risk to health consequent on overcrowding is constantly in the minds of the prison medical officers. In August, 1952, the first detention centre for boys of 14 to 17 years was opened, and the medical officer reports that the training there has had a beneficial effect on the physique and health of the boys admitted. The idea of the centre is to provide an alternative to prison for young offenders who do not need prolonged Borstal training yet are unlikely to respond to probation.

THE PROGNOSIS AND ROLE OF SURGERY IN SPONTANEOUS INTRACRANIAL HAEMORRHAGE

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A balanced understanding of the diagnosis and treatment at present available for spontaneous intracranial haemorrhage is extremely important, and this paper presents on the one hand our experience and on the other our considered opinion regarding the treatment of this condition. The term "spontaneous intracranial haemorrhage" is used rather than "subarachnoid haemorrhage," as the major portion of the bleeding may be at any site from the subdural space to the ventricle. Apoplexy in the elderly arteriosclerotic, so classical in its clinical manifestations, is not included.

Prognosis

The prognosis in cases treated conservatively has been reviewed many times in the past few years, and there is no doubt that the initial mortality rate is about 50%, rising with recurrent episodes and in older patients. In our assessment our first consideration was a series of 100 consecutive cases managed conservatively by one of us from 1936 until 1951. Conservative care means rest in bed for at least one month, care of the bowels, sedation, and the judicious use of lumbar puncture. In these 100 cases, 53 female and 47 male, there were 43 deaths during the initial period in hospital. Although these 43 deaths occurred at any time up to six weeks after the onset of haemorrhage, one third (14 cases) occurred in the first 24 hours and another third (15 cases) in the second week. Excluding the first day there were only eight deaths in the first week, and six patients died in the second to sixth weeks. Fairly clear evidence of recurrent bleeding was present in half the patients dying during the first and second weeks and in all those dying after the close of the second week. All the 57 survivors have been traced. Eight of them have died from recurrence of intracranial haemorrhage and two others of intercurrent disease. Twenty of them have been left with some permanent neurological disability, although only seven are completely disabled by hemiplegia or intellectual loss. Of the eight late deaths from recurrence only two have been in the disabled group; the other six have occurred in those who had made a complete recovery from the initial haemorrhage. The deaths have occurred after an interval of time up to 12 years from the initial episode. Four died of a single recurrence, but four others of a second, third, or fourth haemorrhage. Before considering the way in which surgical investigation and treatment may improve both the mortality and

the disability rate, we must seek a fairly clear picture of the varying clinical syndromes and pathological findings.

During the first few hours following a haemorrhage, it is clear that certain patients are dying. These are deeply unconscious, with gross changes in the vital signs. Many have a rapidly increasing pulse and respiration rate, and excessive bronchial secretion; often decerebrate rigidity, with the arms and legs held in marked extension and varying areas of the body covered with goose-skin and beads of sweat. They show no response other than a generalized increased rigidity to stimulation. All others must be judged upon the changing signs that occur in the hours immediately after the catastrophe; some are unconscious to varying degree and others never unconscious at all. Headache and neurological disturbance, such as hemiparesis, visual field defects, cranial nerve palsies, or dysphasia, may be present. It is in these hours immediately after the haemorrhage that an assessment of the patient is most important and illuminating. There are those who regain consciousness quickly, who have no evidence of gross neurological disturbance, or rapidly improve. Others are still semiconscious but their condition has remained unchanged over the passage of time, and these are the ones who may recover also. Others, however, begin to show progression of neurological disturbance characterized by increasing drowsiness or coma and pupillary change. It is this group which is developing increasing intracranial pressure and a tentorial pressure cone, the medial portion of the temporal lobe being pushed down between the midbrain and the margin of the tentorium, causing the posterior cerebral artery to press upon the third nerve and bring about the pupillary dilatation and non-reaction to light, as well as disturbing the blood supply and function of the midbrain. Unless urgent surgical treatment is undertaken haemorrhagic infarction of the midbrain will occur with all the signs of impending and inevitable death.

As the hours pass into days so more and more of the patients fall into their obvious categories. We are left with those obviously recovering, those developing evidence of slowly increasing intracranial pressure, and those with varying degrees of unconsciousness or akinetic mutism and disturbance of autonomic signs other than of these patients gross neurological signs other than disturbance of consciousness may be present, but it is when we look to the pathological state that varieties of signs and symptoms fall into their proper perspective and the correct investigation and treatment become clear. It must be understood that at any time there may be a recurrence of haemorrhage of variable severity.

Diagnosis and Diagnostic Procedures

There are certain features in the history and clinical signs which are important, particularly dramatic onset, which in difficult cases may be the only lead to the diagnosis. In those cases in which the bleeding has involved the subarachnoid space there is usually neck-stiffness and a positive Kernig's sign, but the absence of these signs in the early stage does not exclude the presence of a great amount of blood in the subarachnoid space, especially when there is deep unconsciousness. Auscultation of the head, normally so unrewarding, may elicit the presence of a systolic bruit from an angioma. Varieties of neurological signs, and particularly ocular pareses, may be present in many cases, and in some a typical subhyaloid haemorrhage will be observed in the ocular fundus. Ocular pareses when present as isolated signs are likely to be due to an aneurysm in close relation to the nerves, rather than

due to a tentorial pressure cone resulting from an intracranial haematoma, and are therefore valuable localizing signs.

In the early stages, particularly if there has been only a mild or premonitory leak of blood into the subarachnoid space, a variety of lower spinal nerve pains may occur; in one of our patients a diagnosis of appendicitis had been made from the lower abdominal pain, rigidity, and vomiting, whilst another developed an obvious crop of herpetic vesicles around the trunk. The patients in whom a haemorrhage occurs almost exclusively into the substance of the brain may have a sudden onset but a rather slower evolution of a syndrome typified by fairly gross neurological disability and increasing headache, somewhat similar to cerebral abscess. Some cases even more insidious in their progression develop signs of considerably increased intracranial tension with papilloedema and drowsiness, resembling a rapidly developing cerebral tumour syndrome.

Lumbar puncture confirms the diagnosis by the finding of blood or xanthochromic fluid. Where the haemorrhage has been essentially intracerebral, blood is usually absent from the cerebrospinal fluid, but it is surprising how rapidly the fluid may alter, showing a rise in leucocytes and protein content. There are cases of intracerebral haemorrhage which may show a relatively normal cerebrospinal fluid at any early stage, whilst a few days later it may be frankly blood-stained although the patient's clinical condition has remained unchanged or has even improved. This is due to the intracerebral clot discharging itself into some part of the cerebrospinal fluid pathways. In an absolutely uncomplicated subarachnoid haemorrhage the cerebrospinal fluid will have returned to normal in about three weeks. Intracranial tension is usually much raised in cases of intracranial haemorrhage, but in intracerebral clot formation, particularly in the elderly, the pressure may be low, as it is in some cases of chronic subdural haematoma. Although in our experience diagnostic lumbar puncture has never been detrimental, it should be performed with caution, particularly in those cases showing evidence of an early tentorial pressure cone.

Angiography

The essence of investigation of spontaneous intracranial haemorrhage is angiography, and until this has been performed, in the majority of cases, the site and the cause of the haemorrhage are both unknown, and definitive surgical treatment cannot be contemplated. We believe, at this stage in our knowledge, that angiography should be performed on all cases of intracranial haemorrhage unless they have considerable arterial hypertension, which we have regarded as a contraindication. This view may be fallacious, as four of these patients have all died of subsequent haemorrhage within a few months.

The need for angiography at present is to obtain further knowledge, particularly of prognosis as well as the planning of treatment. Our usual practice is to perform angiography by the percutaneous insertion of a needle into the common carotid artery under local analgesia, but in a restless or non-cooperative patient general anaesthesia may be necessary. From 10 to 15 ml. of 35% diodone is injected, which gives a clear radiographic picture of the blood vessels. This must be performed on both sides in all cases, with compression of the opposite carotid artery to prove the adequacy of the collateral circulation through the circle of Willis.

Having made such a demand for angiography, it is only right that its possible dangers should be carefully considered. In only one case in which angiography has been performed for the diagnosis of spontaneous intracranial haemorrhage has there been any detrimental result, and this was a mild decrease in the conscious level of a patient who died several weeks later with infarction in the region of the hypothalamus and the anterior portion of the corpus callosum, the angiographic pictures having been thought to be quite normal. In 200 consecutive carotid angiographies performed for a variety of reasons, there has been one death, due to a thrombosis of the internal carotid artery

which was the site of a previous partial occlusion. Seven other patients, all suffering from organic brain disease, have shown some transient increase of physical signs following the investigation. Air studies of the ventricles are necessary only in confirming the presence of an intracranial clot, though ventriculography at a later stage may show a cyst which was a previous clot cavity in communication with the ventricle. The method should be by ventriculography rather than air encephalography, so that the intracranial pressures are disturbed as little as possible to avoid a recurrence of bleeding. An electroencephalogram is a useful adjunct to other investigations in cases of intracranial clot, and also in proving the tolerance of carotid artery occlusion.

Some Outstanding Facts

Using these methods of investigation in 50 consecutive cases referred to us for a variety of reasons and at variable lengths of time after the initial haemorrhage, certain outstanding facts emerge from their comparison with the 100 cases previously referred to in this paper. The first point is that the causes of haemorrhage demonstrated in the living differ from those found in the dead. In all reviews of the natural history of spontaneous intracranial haemorrhage based upon necropsy findings, aneurysm is the greatest cause, but angiographic investigations in the living show a much higher incidence of angioma. Even after severe haemorrhages, and in some cases where large intracerebral clots exist, no cause can be demonstrated either on angiographic investigation or at operation. This is not surprising, since haemorrhage can occur from minute angioma of capillary type, and this has been the cause of large intracerebral haemorrhages in two of our cases.

It is also true that aneurysms which are not visible on angiography, because of their small size or the almost complete occlusion of their cavity by clot, may be the cause of severe haemorrhage. In this respect one patient of ours, having a left-sided aneurysm which had given rise to bleeding and a right-sided hemiparesis, died in hospital as a result of haemorrhage from an aneurysm of the right internal carotid bifurcation which could not be seen on angiography four days previously. At necropsy this aneurysm was found to be completely full of clot, and a slit in the arterial wall beside the aneurysm had caused this torrential haemorrhage. The usual finding, however, will either be a typical small aneurysm, an angioma, or, more rarely, a very large saccular aneurysm which may have reached most remarkable dimensions. It is in these large aneurysms that relatively small haemorrhages seem to occur into the aneurysmal wall, producing cranial nerve paralysis by direct involvement of the nerves and large amounts of clot within the sac.

The following table of figures compares the post-mortem findings in the deaths occurring in the 100 cases treated conservatively with the angiographic and operative findings in those treated surgically, and demonstrates the different aetiological factors in the living and the dead.

Cases of Spontaneous Intracranial Haemorrhage

	100 Cases Treated Conservatively (43% Initial Mortality)	50 Cases Investigated and Treated Surgically (12% Immediate Mortality)	
		Living	Dead
Findings at 35 Necropsies			
Aneurysms	29 (85%)	29 (58%)	5 (10%)
Angioma	2 (6%)	8 (16%)	0 (0%)
No cause found	4 (11%)	11 (22%)	1 (2%)

Angiography may demonstrate the cause of the haemorrhage and also show distortion of the cerebral vessels indicative of intracranial clots.

In several cases we have been surprised to find at operation that upward displacement of the middle cerebral vessels shown on angiography, and suggesting a clot in the temporal lobe, has proved to be due to long-continued local oedema. The findings on investigation may demonstrate the basic pathology, but the vascular anomalies alone cannot always explain neurological disturbances of widespread nature which may occur. Although the angiographic

picture of the major arterial tree may appear complete, terminal branches may be affected by either thrombosis or spasm leading to these additional gross and widespread signs. In 3 of the 50 cases surgically investigated no obvious abnormality was found on angiography or ventriculography apart from ventricular dilatation of unknown cause. These patients have all demonstrated a condition of prolonged akinetic mutism and varying autonomic disturbances, and have eventually died. In the two cases in which post-mortem examinations were performed there were small areas of infarction in the medial surfaces of the frontal lobes and hypothalamus, with a tiny aneurysm of the anterior cerebral artery.

Treatment

With all the results of investigations at our disposal four distinct lines of treatment become obvious: non-intervention, to allow natural recovery; evacuation of large intracranial clots; proximal ligation of vessels; and direct attacks upon aneurysm or angioma. Sympathetic interruption is still open to question, but we believe, from the extreme narrowness of vessels often seen on angiography in these cases, that spasm is likely to be present. The aim must be to save the patient's life, make his future more secure, and improve his chances of recovery from severe neurological disability, but in so doing never exposing him to a greater risk. Our investigations have shown such a diversity of gross vascular anomalies, with amazing recovery by natural means alone, that we are sure no one should be exposed to a great risk for an uncertain purpose. Many of these natural recoveries have been so good that they would have delighted the heart of any surgeon who had operated and thought his act responsible for the recovery.

Evacuation of intracranial clots usually means the evacuation of intracerebral ones; the majority of the clot, however, may be in the subdural space, particularly in children. The removal of these clots is not technically difficult; in the acute case it is life-saving, and in the more chronic one it reduces the likelihood of severe persistent disability. These intracerebral clots have certain interesting features: in any particular area the enlargement of clot from the haemorrhage is always along certain apparent well-defined tracks, with the ventricular wall forming the inner boundary. In the very chronic cases the clot is still solid, with a reactive glial wall forming around it, stained yellowish-brown from blood-pigment absorption. Within such a clot cavity will lie the cause of the haemorrhage, and in our experience this is always in one of the walls and not in the centre of the cavity. It is through such clot cavities that aneurysms and angioma may easily be exposed and local treatment decided upon. In the 35 post-mortem examinations from the 100 cases treated conservatively, 34% had large intracerebral clot formations, and there is no doubt that these clots were the cause of fatality in most of these cases. In the 50 cases surgically managed, 16, or 32%, have had intracerebral clots. All those from whom clots were evacuated survived, but mistaken surgical judgment in three cases resulted in death of the patient with large cerebral clots existing. Cases with oedema simulating clot benefit a great deal from decompression; therefore the distinction is less important than would be theoretically apparent.

We believe that, whenever possible, proximal arterial occlusion should be the first consideration in any case, and that in many it will remain the ideal or only method applicable. Proof of tolerance of carotid occlusion must always be sought by angiography and trial compression before it is utilized as a permanent treatment. The form of proximal arterial occlusion is best considered according to the type of lesion and its situation. Let us first consider varieties of intracranial aneurysm in this respect. For those upon the internal carotid artery or at its bifurcation there is no doubt that ligation of the common carotid artery, followed at an interval by that of the internal itself, is of great value in reducing the intra-arterial pressure at the site of the aneurysm and leading to thrombosis of the aneurysmal cavity. We hope shortly to show by recordings

of the intra-arterial pressure above the point of arterial occlusion that adequacy of anastomotic circulation can be assessed accurately, and certainty or uncertainty of tolerance predicted. For aneurysms upon the anterior cerebral artery, proximal ligation of the anterior cerebral artery itself just beyond its origin is advised. This also applies to the posterior cerebral artery. For the posterior communicating artery temporary carotid ligation should be employed, with direct attack upon the aneurysm itself in chosen cases. This also applies to aneurysms of the middle cerebral artery, though we are still uncertain of the best treatment of aneurysms affecting this essential vessel.

The angioma of large size, particularly when they are basal or medial in position or bilateral in extent, are often amenable only to treatment by arterial interruption. Here, as in the case of aneurysms, each and every case must be judged on its own merits, its individual anatomy, and its tolerance to arterial interruption. In this respect individual anatomy often causes great surprise: in one of our cases having a large bilateral angioma in the medial surfaces of the frontal lobes angiography showed that the blood supply to the angioma passed through the internal carotid arteries, and that the normal circulation of the brain was via the external carotid and vertebral arteries. This patient tolerated ligation of both internal carotid arteries, but digital compression of both common carotid arteries immediately proved them to be well named as the arteries of sleep, for the patient immediately became unconscious, only to recover within seconds of release of the compression.

It is important to appreciate the individuality of the cerebral circulation and the need for careful proof of tolerance of its interruption. In particular, ligation should not be performed whilst the collateral circulation may be in jeopardy from high intracranial pressure due to intracranial clots, which must be removed by operation before arterial interruption is undertaken. In this respect sympathetic interruption and carbon dioxide inhalation to produce vasodilatation of the cerebral vessels may be useful to improve the cerebral collateral circulation.

The exposure of aneurysms is usually not in itself technically difficult, although it may prove an anxiety to the surgeon and his assistants. The fear of torrential haemorrhage always exists, even though this can be controlled to a large extent by hypotensive drugs and arterial compression. There is really no part of the circle of Willis above the tentorium which cannot be exposed surgically, but, when an aneurysm is found, often only one side of it can be seen so that a number of vessels taking origin from the aneurysmal wall may remain unseen. Carotid interruption will reduce the pressure in aneurysms even of the posterior communicating artery; at operation we have seen fairly large vigorously pulsating aneurysms of this artery cease pulsating, both visually and to a palpating finger, when the carotid artery has been occluded in the neck. If at this stage the aneurysmal wall is opened, blood flows from the aneurysm in a steady stream, which undoubtedly represents the diastolic pressure. The aneurysmal cavity can now be packed with muscle, bleeding controlled, and the cavity completely obliterated. We believe that packing of the aneurysm in appropriate cases is the best treatment, and, failing this, wrapping of the aneurysm in muscle or gauze. The wrapping of an aneurysm is possible only when it is completely exposed, and we have found it to be of considerable value with the small dangerous aneurysms of the middle cerebral artery. Clipping the neck of an aneurysm has not been possible in our hands, and we doubt if by this method the danger area of the aneurysm—namely, the neck and its junction with its parent artery—is rendered safe. It is unfortunate that obliteration of the aneurysmal cavity is no proof that there will not be a torrential haemorrhage from rupture of the artery close to the neck of the aneurysm, which itself is full of organized laminated clot. We must therefore follow up with great care our cases, treated surgically, to see if their future is better than that of those treated conservatively.

The removal of a cerebral angioma may be very simple, particularly if it is a small one lying within the wall of a

clot cavity or cyst cavity resulting from a previous haemorrhage. On the other hand, a large ramifying angioma may be extremely difficult to remove and the patient's life jeopardized by the attempt. We must remember, therefore, that the natural history of the angioma is not so menacing to the patient's life as that of aneurysms. These angioma must be very carefully assessed and the patient's disability considered before removal is decided upon. Certainly it has not been our experience that epileptic attacks can be diminished by the removal of these vascular anomalies.

Surgical treatment as outlined above will undoubtedly reduce the number of deaths due to intracranial haemorrhage of varying cause and severity, particularly those deaths occurring several days after the initial haemorrhage. It is unlikely that the mortality rate over the first 24 hours will be altered very much. It will be remembered that 34% of the cases examined at necropsy in the conservatively treated group had large intracerebral clot formations, and it is true to say that a large percentage of this group could have been saved by surgery. Well-planned proximal ligation will reduce the pressure within the aneurysm and its parent vessels and probably reduce the incidence of recurrent haemorrhage. The incidence of recurrent haemorrhage will also be reduced in those cases in which aneurysms or angioma are completely removed.

The reduction in the mortality rate inevitably increases the number of patients surviving with a disability, and, whereas in the conservatively treated group 35% of the survivors had residual defects, 52% of the survivors in the surgical group were left with some form of neurological disability. In only 12%, however, was this severe enough to prevent gainful employment, and it was in these six patients that the three late deaths occurred. Disabilities among the survivors from spontaneous intracranial haemorrhages make the need for physiotherapy, speech therapy, and nursing care greater. The provision of facilities for investigation, treatment, and aftercare of these patients is an increasing problem in the neurosurgical departments of the country.

Conclusion

Spontaneous intracranial haemorrhage is a dangerous and treacherous occurrence. The initial catastrophe may be overwhelming, and death may take place in a few minutes or hours; but, should a victim of such a haemorrhage survive beyond this, other dangers no less severe lie before him. Provided the first 24 hours are passed few deaths occur in the first week, whilst in the second week the number of deaths equals that of the first 24 hours, unless surgical investigation and treatment are undertaken. These later deaths are due mainly to large intracranial clots or recurrent haemorrhages. The surgical aim, therefore, should be to investigate these patients in the first week after the initial haemorrhage, so that intracranial clots may be removed or other operative procedures performed to prevent recurrence of haemorrhage. Investigation of spontaneous intracranial haemorrhage is of great importance, for there is no doubt that surgical intervention can improve the individual patient's expectancy of life and reduce his neurological disabilities.

Summary

One hundred cases of spontaneous intracranial haemorrhage treated conservatively have been analysed and compared with 50 cases investigated by angiography and treated surgically. It has been shown from these figures that angiography should be done in the first week following the haemorrhage, so that removal of intracranial clots and the treatment of vascular anomalies by proximal ligation or direct attack may be undertaken in order to prevent recurrence of haemorrhage. It has been stressed that caution is needed not only in treatment but in assessing its curative value. There is no doubt that great help can be given to individual patients and the mortality rate considerably decreased.

REVIEW OF MENTAL ILLNESS IN THE OLDER AGE GROUP

BY

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This review of 198 female patients admitted at the age of 60 or over to one particular section of the Royal Edinburgh Hospital for Nervous and Mental Disorders is designed to call attention to the wide variety of clinical syndromes found in this age group. The choice of the age of 60 as a base-line is deliberate, and is a tacit recognition of the conventional tendency to attribute any gross deviation in thought and conduct observed in patients over 60 to a greater or less degree of "senile" pathological change in the cerebral vessels or brain parenchyma. It may be remarked at the outset that our findings do not corroborate this popular assumption. Many other types of toxic-infective, neoplastic, or degenerative cerebral disease may be the underlying cause. Moreover, while it is wise to look first of all for an organic lesion to explain mental symptoms at this period, it is also true that the so-called "functional" psychoses—notably depression—may erupt for the first time in the individual's life cycle after the age of 60. All these alternatives add to the difficulty of diagnosis, but they also imply that prognosis and reaction to treatment may be better than is usually thought.

In the past ten years many excellent papers have appeared on this subject of mental illness in the older section of the population. The majority of these, however, deal with the statistical implications of the rise in mental morbidity in this group. Only a minority are devoted to clinical aspects. This discrepancy has been emphasized by Professor Aubrey Lewis (1946), who states: "The clinical is probably now the most neglected field in the study of the psychiatry of ageing. . . . I would therefore plead for a greater interest in the straightforward clinical aspects of mental disorder as seen in the aged." Even in the few clinical studies published, clinico-pathological confirmation is sometimes lacking, yet it is precisely in mental illness in the elderly, which is often too readily ascribed to senile degenerative processes, that necropsy studies are most valuable.

Clinical Material

The 198 patients reviewed represent all the female patients of the age of 60 or over admitted to one section of the hospital during the six-year period January 1, 1946, to December 31, 1951. Each patient was studied by one of a group of six physicians, and all were under the observation of one of us (E. E. R.) throughout their stay in hospital in the period under review. The number of admissions of the over-60 group during this period was 244, and the number of individual patients 198. The discrepancy between the two figures illustrates the well-known tendency for affective psychoses to recur; for, apart from a few patients with "arteriosclerotic episodes," nearly every patient with two

or more periods in hospital suffered from recurrent manic or depressive episodes. The social background of the patients can be summarized by the statement that they represented a cross-section of all social grades with the exception of the very wealthy.

At the end of the five-year period 81 (41%) had been discharged, 38 (19%) were still in hospital, and 79 (39%) had died. (These figures refer to individual patients.) Thirty-four necropsies were performed, representing 43% of all deaths. This is not as high a necropsy percentage as we could have wished, but every doubtful case was included. This may be illustrated by reference to group II, which included the supposedly rare organic states, such as Alzheimer's disease, Pick's disease, cerebral tumour, etc. In this group necropsy was carried out in every case of death. In addition 14 necropsy reports on patients admitted at the age of 60 or over during an earlier period, but dying in the period under review, were scrutinized for comparison. Of the 14 patients, 10 suffered from an organic cerebral disease and four from a depressive psychosis.

The diagnostic classification of the 198 patients is summarized in the accompanying Table.

	Total	Age on Admission		Deaths During Period	% Necropsies to Deaths
		60-69	70+		
A. Unequivocally organic psychoses (total, 92):					
Group I: Cerebral arteriosclerosis and senile dementia	68	9	59	47	30%
Group II: Organic cerebral disease not included in group I:					
(a) Alzheimer's disease 10	24	24	—	11	100%
(b) Pick's disease 2					
(c) Cerebral tumour 3					
(d) Amyotrophic lateral sclerosis with mental symptoms 1					
(e) Syphilis 3					
(f) Drug intoxications 3	7	5	2	6	
(g) CO poisoning—cerebral lesion 1					
(h) Myxoedema 1					
B. "Functional" Psychoses (total, 96)					
Group III: Affective states:					
(a) Uncomplicated:	58	51	7	4	
Depression 54					
Mania 4	7	5	2	6	
(b) Depression secondary to physical disease:					
(i) Extrapyramidal disease 3					
(ii) Cardiac disease 2					
(iii) Aortitis 1					
(iv) Carcinoma 1					
Group IV: Paraphrenia and schizophrenia	65	56	9	10	40%
Group V: Psychopathic states	23	15	8	6	33%
C. Group VI: Mixed organic and affective symptomatology (total, 10)	8	8	—	—	
	10	7	3	5	66%

A. Organic Psychoses.—Slightly less than half the total number of patients reviewed (92 out of 198, or 46.5%) suffered from organic psychoses—that is, they displayed intellectual and emotional disturbances of the type found in association with pathologically verifiable lesions within the brain (groups I and II).

B. Functional Psychoses.—The number of patients diagnosed as suffering from one or other of the so-called "functional" psychoses (affective states, schizophrenia, psychopathic states) was roughly similar, being 96 out of the total 198, or 48.4% (groups III, IV, and V). Here the mental disturbance was confined to the emotional sphere and intellectual defects were absent. (We are aware that this differentiation between organic and "functional" psychoses on a

basis of presence or absence of intellectual defects is an over-simplification. The aggregation of mental symptoms seen in frontal lobe tumour or as a sequel to some cases of encephalitis, for instance, may include no intellectual defects measurable as such, yet they none the less warrant the designation of organic psychoses. But, accepting this dichotomy between "emotional" and "intellectual" as artificial, it is nevertheless a useful abbreviation for present purposes, and avoids the necessity for summarizing the other manifold criteria of differentiation between the organic and "functional" psychoses.)

C. In 10 of the 198 patients, or 5%, difficulty was experienced in deciding whether the patient was suffering from a pure affective state—the predominant affect in all 10 was depression—or whether senile organic change coincided. They are accordingly classified under the designation "mixed symptomatology" (group VI).

Age Incidence

Illustrated in Fig. 1 are the relative proportions in each diagnostic group, and also the age incidence. It will be noted that by far the greater number of patients diagnosed

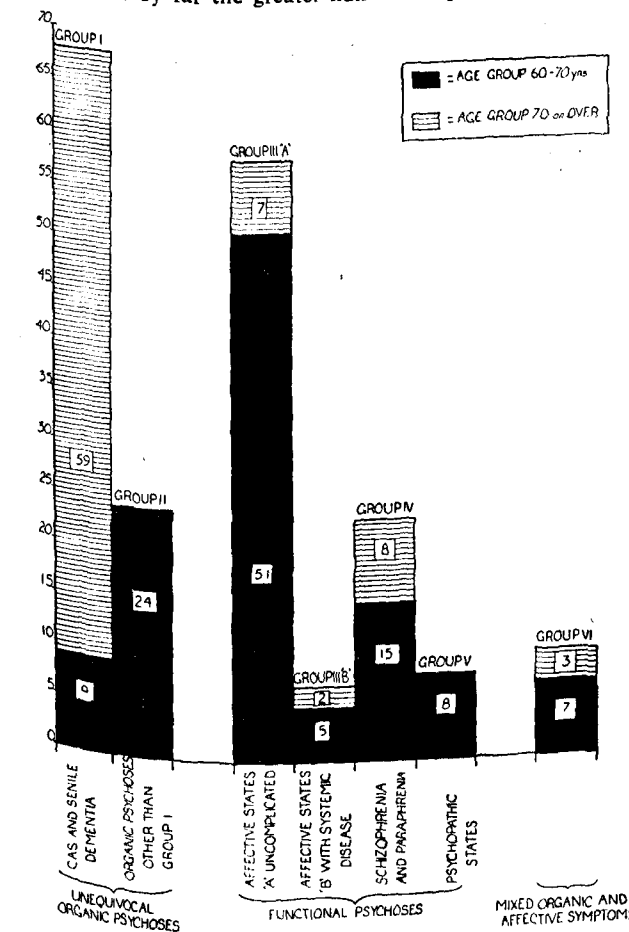


FIG. 1.—Diagnostic groups.

as suffering from cerebral arteriosclerosis and senile dementia (group I) were aged 70 and upwards at the time of admission; only 9 of the 68 were aged 60 to 69. An almost exact reversal of this ratio is found in the second largest numerical group of affective states (groups III, a and b), where 56 were aged 60 to 69, and only 9 were aged 70 or upwards at the time of admission. Patients suffering from organic cerebral disease other than cerebral arteriosclerosis and senile dementia (group II) were all aged 60 to 69 on admission. The smaller groups IV, V, and VI show a similar preponderance. This suggests that mental symptoms occurring in patients between the ages of 60 and 69 give rise to infinitely more varied diagnostic possibilities than those occurring in later decades.

A. Organic Psychoses (92 Cases)

Group I: Senile Dementia and Cerebral Arteriosclerosis (68 Cases)

Sixty-eight patients—approximately one-third of the total patients reviewed—suffered from cerebral degenerative processes classically associated with old age, and of these only 9 were under 70. Senile dementia (in which degeneration occurs primarily in the parenchyma of the brain) and cerebral arteriosclerosis have been bracketed together, since, despite the dicta of some writers, they are not always easy to differentiate on clinical grounds alone. The slow but relentless mental deterioration, global memory defect, and absence of focal neurological signs seen in senile dementia have been contrasted with the fluctuating course, greater retention of personality, and frequency of focal signs regarded as characteristic of cerebral arteriosclerosis. Admittedly, the typical case of either is easily recognized. For instance, using the accepted criteria of diagnosis of cerebral arteriosclerosis, we readily concluded, on clinical examination alone, that 8 of the 9 cases in the 60 to 69 age group and 15 of the 59 aged 70 or over were suffering from cerebral arteriosclerosis and not senile dementia. But cerebrovascular disease does not invariably present with the triad of signs popularly ascribed to it. When vascular changes occur primarily in the smaller cerebral arteries—a condition which by reason of its specific pathology warrants the separate title of *arteriolosclerosis*, the clinical picture closely simulates that seen in senile dementia. And even *atherosclerosis*, or disease of the larger arteries, particularly when it occurs after the age of 70 and is "decreased" in type—that is, unaccompanied by peripheral hypertension—may follow a steady unremitting course, more reminiscent of senile dementia than "classical" arteriosclerosis. Another obvious difficulty is that these pathological conditions may appear in combination. In 24 consecutive necropsies the lesion was found to be sufficiently discrete to merit subdivision in 16, which were made up as follows: atherosclerosis 8, arteriolosclerosis 3, and senile dementia 5; while the remaining 8 cases showed varying combinations of parenchymatous and vascular disease. We stress these points deliberately because we have observed that writers demarcate these conditions on clinical grounds alone, and on this dubious basis draw conclusions on their relative frequency. Although we believe that there are many subtle differences in the mental picture to act as pointers in the differentiation of these senile pathological processes, and that it is an obligatory clinical exercise to attempt such differentiation, we are convinced that separation into two arbitrary categories should not be made unless all the cases considered have been submitted to necropsy.

Group II: Organic Psychoses other than Senile Dementia and Cerebral Arteriosclerosis (24 Cases)

In this group the underlying cerebral lesion was the result of a variety of causes, including infection, intoxications, and tumour, such as may occur at any period of life, or degenerative processes of the Pick or Alzheimer type, the aetiology of which is as yet unknown, but which characteristically appear between the ages of 40 and 60—that is, in the "presenile" rather than the senile period. The various syndromes are included in the Table and are illustrated in Fig. 2. This group of patients, all of whom were aged 60 to 69 at the time of admission, numbered 24. This figure should be set beside the number of patients admitted in the same age decade with cerebral arteriosclerosis or senile dementia, who totalled only 9. The nature of our material precludes the drawing of too narrow conclusions from these figures, since it is probable that patients with mild or transient defects based on cerebral arteriosclerosis, for instance, may never be admitted to a mental hospital. Nevertheless, they emphasize that many aetiological factors require consideration before a final diagnosis is made on an organic mental picture occurring between the ages 60 to 69.

Infections and intoxications do not on the whole give rise to difficulty in diagnosis, since the history is usually sugges-

tive and the bacteriological findings are often conclusive. But it is rare to find the presenile degenerative states and cerebral tumour diagnosed before admission—they are most commonly presumed to be cases of cerebral arteriosclerosis or senile dementia. The failure to recognize tumour rests in part on the tendency to regard headache, vomiting, and papilloedema as early and invariable symptoms, whereas in patients of this age group they are either late in developing or may never appear at all. But a more frequent cause of non-recognition is the tendency to mistake or disregard

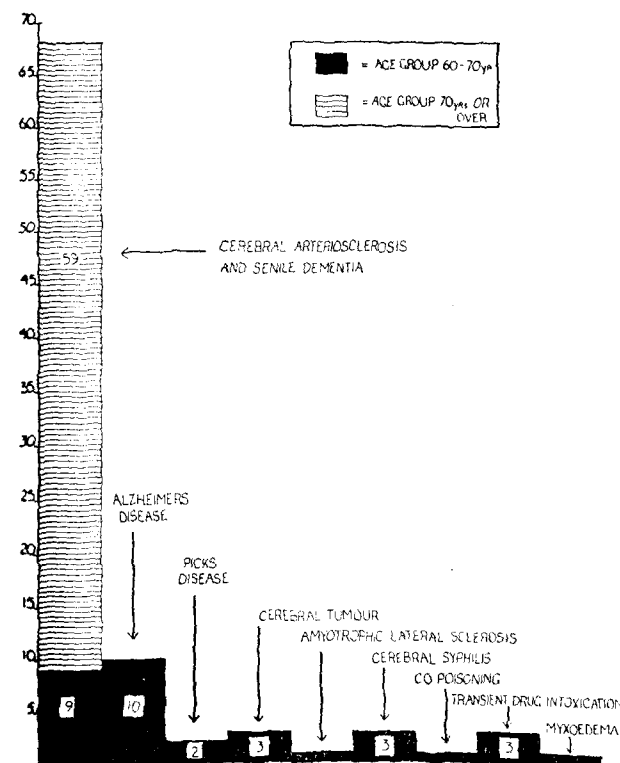


FIG. 2.—Analysis of organic psychoses.

focal signs in the psychic sphere. An aphasic defect in the form of difficulty in naming objects, for instance, may be put down to generalized memory loss. A more severe sensory aphasia may be interpreted as apathy and indifference, or even deafness.

Alzheimer's and Pick's Diseases.—These presenile degenerative diseases accounted for the admission of 12 of the 198 patients reviewed, or approximately 6%. Since they are reported to occur more often in women than in men, a comparable group of male patients might not be expected to show quite the same high incidence. In 10 of the 12 patients, symptoms had appeared before the age of 60. There was reason to believe that the same was true of the remaining two, but their histories could not be adequately ascertained. Necropsy was carried out on all patients who died (Alzheimer's disease, 5; Pick's disease, 1) and the diagnosis confirmed. A long history of steady intellectual decline beginning before the age of 60 should give rise to the suspicion of the existence of one of these presenile degenerative disorders. A remarkable finding in this group is the lengthy duration of the illness before referral for medical opinion—relatives accepting the manifold disabilities of the patient without query. Aphasic and apractic defects are invariably present, and the degree of intellectual deterioration is much more profound than that found in any patient of equivalent age with cerebral arteriosclerosis—unless the latter is accompanied by a severe degree of peripheral hypertension. We believe that Alzheimer's disease and Pick's disease are less rare than is supposed. It is not submitted, of course, that their recognition results in any practical therapeutic advantage to the patient. Nevertheless, at some future date their aetiological elucidation may throw light on general problems of ageing, and, at the present

time, statistical surveys of the older hospital patient which neglect the separate diagnosis and classification of this group result in an erroneous interpretation of the frequency of the true senile degenerative states.

B. "Functional" Psychoses (96 Cases)

Incidence of Earlier Mental Illness.—One feature in particular distinguishes the functional psychoses from organic cerebral disease, and that is the frequent finding of earlier mental illness in the former. Such earlier mental illness may have been episodic, as in the affective states, or continuous, as in the majority of cases of schizophrenic or paraphrenic disorder. Or again, as in the psychopathic states, the patient may have shown lifelong aberrations of conduct—such aberrations only on occasion reaching sufficient magnitude to require admission to a mental hospital. In all these cases age may be of little or no importance in aetiology.

Group III: Affective States

Affective psychoses occurring at the age under review customarily take the form of depression—manic reactions are infrequent. This high incidence of depression found in later life has long been recognized by mental hospital physicians. Clouston (1904), in an analysis of cases of "senile insanity," stresses the frequent occurrence of "simple melancholia," adding, "its only special senile character being that it occurred in old people." This phrase admirably describes the cases considered in group III of this series. These also showed the incidental features associated with depression whatever the age of onset, as follows:

1. **High Incidence of Previous Affective Illness.**—All four patients with a manic reaction and 27 of the 54 patients with uncomplicated depression had a history of one or more attacks of a similar illness before the age of 60. All had been capable of normal work in the interval. The remaining 27 of the 54 patients with depression—that is, 50%—had no previous history, and this was also true of no fewer than six of the seven patients who became pathologically depressed in the course of a severe systemic illness.

2. **High Incidence of Attempted Suicide.**—A determined suicidal attempt had been made immediately before admission by 15 of the total group of 65 patients, or 23%. (The methods utilized were: coal-gas poisoning, 6; corrosive poisoning, 2; barbiturate poisoning, 1; cut throat, 2; severed arm vessels, 1; jumping from window, 3.)

3. **Relatively Good Prognosis.**—By December 31, 1951, three of the four patients with a manic reaction had been discharged recovered. Of the 54 patients with uncomplicated depression, 34 (63%) had been discharged recovered. Of these 34 recoveries, however, six had been admitted on two or more occasions during the six-year period with recurrent depressions, and the prognosis in regard to the future of these six was doubtful. This leaves a corrected sustained recovery rate of 28 out of 54 cases of depression, or 52%. Twenty of the 54 did not recover, and, of these, four had been discharged, twelve were in hospital and four had died by the end of the period. Electric convulsion therapy was given to 32 of these 54 patients aged 60 or over. A surprisingly large number recovered in the first month following admission without the aid of E.C.T. A similar observation has been made by Karagulla (1950) in a study carried out in this hospital on a large series of depressions in all age groups. Of the seven patients (group III, b) whose depression occurred on a background of severe physical illness, six died as a result of the underlying illness and one was discharged.

4. **Absence of Gross Histopathological Findings in the Brains of Patients Dying During a Depressive Illness.**—The absence of intellectual defects in the clinical picture of these senile depressive states was reflected in a similar absence of gross cerebral pathological change in those cases submitted to post-mortem examination. The histopathological findings in eight cases (four belonging to this series and four relating to similar patients admitted before 1946 but dying in the period under review) in no way differed from those reported in patients dying at the same age period with other than mental disease. Slight gyral atrophy, slight patchy atheroma, or a minor degree of arteriosclerosis unaccompanied by gliosis or cellular loss were usual findings. Two cases showed no pathological abnormalities.

Relationship of Depressive Psychosis to Ageing.—The finding that 50% of all patients with depression had no history of a similar illness in earlier life—and the additional

finding that in the 50% previously affected long periods of normal functioning had intervened between their former illness and present breakdown, would suggest that the ageing process plays some contributory part in the causation of such depressive illnesses. In this respect depression differs from the other functional psychoses responsible for the admissions of patients in this age group (see below).

Group IV: Schizophrenia and Paraphrenia (23 Cases)

In this group a history of earlier mental illness was obtained in no fewer than 20 of the 23 patients, and in these cases the description given was rarely one of episodic breakdown with intervals of normal functioning as in the foregoing cases of recurring depressions, but took the form of a long-standing socially incapacitating mental illness. In 15 of these 20 the lengthy duration of the illness was confirmed by hospital case records, in 5 by evidence of relatives. Illnesses of 20 to 30 years' duration were common. One patient had first been admitted to this hospital 42 years previously, had been removed a year later, and had lived the life of a recluse under the care of her relatives until her second admission at the age of 68. It was more common to find that these patients had a history of frequent long sojourns in hospital, yet their records also illustrated that a florid schizophrenic thought disorder was not incompatible with equally long periods spent outwith hospital supervision. These are, of course, commonplace facts of mental hospital experience. They are reiterated here in order to stress that admission to hospital with a schizophrenic or paraphrenic illness after the age of 60 does not necessarily imply that the patient first developed symptoms at this age. In only 3 of the 23 patients in this group was the illness of seemingly recent onset. It is appreciated that paranoid symptoms as distinct from paraphrenia are common in this age group. They may occur in depression or in association with organic cerebral disease. But the "systematized delusional insanity" of the older writers would appear from these figures to begin only infrequently after the age of 60.

Group V: Psychopathic States and Epilepsy

These eight patients had shown lifelong aberrations of conduct: in five these aberrations had been so severe as to lead to frequent earlier admissions to a mental hospital. In three the conduct disorder had displayed itself in chronic alcoholism; one suffered from epilepsy, with concomitant emotional disturbance; while the remaining four had displayed antisocial conduct throughout life. This number does not truly indicate the proportion of such patients admitted at the age of 60 or over. Two of the cases of drug intoxications in group II were drug addicts with psychopathic character anomalies. One of the cases of cerebral arteriosclerosis in group I had a long history of behaviour disorder, including chronic alcoholism, and had been admitted at an earlier age with a Korsakoff's psychosis. The necropsy findings in this case revealed, in addition to vascular softening, an extreme reduction in size of both mamillary bodies—an observation of interest in view of the earlier Korsakoff's psychosis. Nevertheless, if a few such cases with psychopathic character anomalies are added, the total number is still small. This corroborates the accepted hypothesis that age, by diminishing the aggressive urges, ameliorates to some extent the condition of this unfortunate group (Henderson, 1939).

Group VI: Mixed Affective and Organic Symptomatology (10 Cases)

The predominant affect in all these 10 patients was depression—four had made determined suicidal attempts before admission—yet they also showed features suggestive of organic cerebral disease. Only two recovered. Their recovery was rapid; electric convulsion therapy was not given, and afterwards they showed no intellectual defects other than those explicable in terms of normal senility—both were over 70.

The remaining eight formed a homogeneous group, alike in clinical symptomatology and the intractable and distress-

ing nature of the illness. All displayed extreme agitation, perseveration in speech and action, and, finally, profound deterioration in personal habits. Of these eight patients five received one or more courses of convulsion therapy, and prefrontal leucotomy was later performed on one of these five. At the end of the period reviewed, three were still in hospital unchanged and five had died. Necropsy was carried out in three of the five deaths. In the first, macroscopic and microscopical examination of the brain was negative; gyral atrophy and a mild cortical arteriosclerosis were demonstrated in the second; while in the third a somewhat more severe arteriosclerosis with slight nerve-cell loss was reported. All three patients were aged 65 to 69 at the time of death. While it would be tempting to postulate of the eight cases showing this malignant syndrome that senile cerebral changes may aggravate and perpetuate a depressive illness, no conclusions can be drawn from these equivocal findings in a small number of necropsies. It may be that, despite the seeming organic nature of part of their symptomatology, these patients actually suffered from a true depression and that the necropsy findings are fortuitous. We feel, however, that their separation from the other cases of depression in this series is justified both by reason of the particular clinical picture shown and because they emphasize the existence of a group of resistant depressions not susceptible to amelioration by physical methods of treatment.

Summary

A review is made of a group of 198 female patients admitted to a mental hospital at the age of 60 and over. Attention is drawn to the diversity of clinical syndromes found.

Approximately one-third of the total suffered from the cerebral degenerative processes commonly associated with old age—namely, cerebral arteriosclerosis and senile dementia. These two conditions are bracketed together, since necropsy studies indicated that they could not always be differentiated on clinical findings alone. One-eighth of the patients suffered from other types of cerebral disease, and this demonstrates that organic dementia occurring in later life should not be too readily ascribed to cerebral arteriosclerosis or senile dementia.

Approximately another third of the total were admitted with a diagnosis of depression. Half of these patients had a history of previous depressive episodes, while half developed a depression for the first time after the age of 60. This suggests that age has some importance as a contributory factor. Two smaller groups of patients were diagnosed as suffering from schizophrenic-paraphrenic psychoses and psychopathic states. The history in almost all these cases revealed that the psychosis or personality anomaly had been manifest long before the age of 60.

All these findings denote that *en bloc* statistics of mental hospital admission can give only inadequate information on the mental sequelae of ageing.

Our thanks are due first of all to Professor Sir David K. Henderson, not merely for permission to publish these cases, but for his teaching, with its emphasis on the importance of exact diagnosis in the organic psychoses. We are indebted to Professor A. M. Drennan and his associates in the neuropathology department, Edinburgh University, for the detailed pathological reports. It is a pleasure to acknowledge the help of former assistant physicians—notably Drs. S. Karagulla, B. Magill, B. Allen, and J. H. Brown—whose careful case histories revived our memory of the individual patients. The diagrams were drawn by Mrs. N. L. Mason Browne.

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EFFECTS OF TESTOSTERONE IMPLANTS IN MEN WITH DEFECTIVE SPERMATOGENESIS

BY

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The causes of defective spermatogenesis in men are largely unknown, and it will generally be agreed that the methods of treatment, correspondingly empirical, are for the most part ineffective. It has seemed justifiable to try any form of treatment which might help at least some men, and, provided sufficiently accurate data are collected, there is no doubt that trials of this kind are fully warranted. Too often, of course, treatment has been given because a single seminal specimen failed to reach acceptable standards; conclusions drawn from such instances are usually misleading. Consequently, lack of adequately controlled observations in most of the literature dealing with this subject has led to a widespread therapeutic nihilism and its attendant apathy. The prevalence of seminal deficiencies, and our ignorance of how to deal with them, demand, of course, a very different attitude.

There is little doubt that testosterone plays a part in spermatogenesis, though its exact role is still uncertain. There is equal certainty that large doses of testosterone will inhibit spermatogenesis, through its action in depressing the production of pituitary gonadotrophin. Heckel *et al.* (1951, 1952), as is now well known, maintain that on cessation of high-dosage testosterone administration the sperm count rises, not only to its pre-treatment level, but, by reason of a rebound effect, to far higher levels. Other workers have been less impressed by this rebound phenomenon, which is certainly missing from many cases treated according to the method of Heckel. It has seemed possible, on the other hand, that continuous low-dosage testosterone administration might actually stimulate spermatogenesis, or improve sperm motility when this is the deficient characteristic. In order to examine this possibility implants of testosterone have been given to a number of men with various kinds of seminal deficiencies. Implantation was chosen as the route of therapy since it is convenient—a single implant remaining effective for some six months—and affords a slow continuous administration of the steroid.

Material and Methods

The men treated in this series were patients attending the Fertility Clinics at University College Hospital and at the Hospital for Women, Soho Square. Seminal analyses on masturbation specimens were made by a standardized technique, which was the same at both hospitals. They involved determination of volume, density, total percentage of abnormal forms and motility indices according to the method of Emmens (1947) at two or more times. The general plan adopted was to obtain three seminal specimens, each preceded by a three-day (at U.C.H.) or five-day (at Soho) period of abstinence (the difference in period of abstinence seems to be immaterial) before treatment; to administer either two or three 100-mg. pellets of testosterone by subcutaneous implantation at the upper outer aspect of the thigh, just below the iliac crest; and to analyse three further seminal specimens, collected one, two, and three months after implantation. Naturally this plan miscarried on several occasions.

In all, 83 implantations were made in 72 men. Of these, 16 men failed to furnish any post-treatment specimens and so must be discarded. There thus remain for analysis 56 men who received 67 implants. Twenty-eight implantations were of two 100-mg. pellets and 39 were of three 100-mg. pellets of testosterone.

Results

General Effects on Seminal Fluid.—In the first place, the mean figures before treatment for each individual for volume, motility, density, and morphology were compared with the corresponding mean figures after treatment. On this basis, it appears that some degree of general improvement in the seminal fluid was found in 28 individuals, of whom 12 had received 200 mg. and 16 had had 300 mg. of testosterone. In 22 men the findings appeared to be unchanged; while in the remaining six men the post-treatment specimens were definitely worse. In this last group, one man had had 200 mg. and five men 300 mg. of testosterone.

The next step in the analysis was to compare the mean figures for all volumes, motilities, densities, and morphologies before treatment with the corresponding figures after treatment. In dealing with motility it was necessary to find a suitable expression for the comparison of different specimens, the motilities for which might have been recorded at different times after production. For this purpose the "five-hour motility" figure has been used. To calculate this, the motility scores, which range from 4 (maximum) to 0, were plotted against the age of the specimen at the time of scoring, a straight line being drawn through the points. The score at five hours was thus interpolated, and was then expressed as a percentage of the maximum figure 4. Thus, if the interpolated motility index at five hours was found to be 3, the "five-hour motility" would be $\frac{3 \times 100}{4} = 75$.

The overall results are given separately for 200-mg. and 300-mg. implants in Table I. From this it is clear that, in general, both doses had similar effects; that little change in volume was observed; that motility appeared to be improved and density increased; and that the percentage of abnormal forms was slightly increased.

TABLE I.—Mean Values and Standard Errors

		Dose of Testosterone	
		2 × 100 mg.	3 × 100 mg.
Volume (ml.)	Before implantation	3.49 ± 0.24	3.42 ± 0.16
	After	3.81 ± 0.23	3.21 ± 0.15
5-hour motility*	Before	34.89 ± 4.28	20.55 ± 2.57
	After	47.27 ± 4.77	35.73 ± 3.43
Density (millions per ml.)	Before	32.08 ± 9.20	26.62 ± 2.04
	After	37.31 ± 7.56	40.94 ± 2.39
% abnormal spermatozoa	Before	37.17 ± 1.99	34.44 ± 2.36
	After	43.66 ± 2.09	35.55 ± 1.07

* For explanation see text.

Motility.—Inspection of the data for individual men showed clearly that where the initial motility was of an extremely low order—the mean five-hour motility figure being 5 or less—implantation was followed by no improvement whatever. Since extreme asthenospermia is thus not susceptible to this treatment, it seemed reasonable to exclude such cases and to compare the pre- and post-treatment data for the remainder. This is done in Table II, from which it appears that comparable improvement is found in both the 200-mg. and the 300-mg. series. Reference to Table III, which combines the results for 200-mg. and

TABLE II.—Effect on Motility, Excluding Cases of Extreme Asthenospermia before Treatment. Mean Values and Standard Errors

		Dose of Testosterone	
		2 × 100 mg.	3 × 100 mg.
Before implantation	..	41.11 ± 4.61	25.47 ± 2.92
	After	57.36 ± 4.56	41.67 ± 3.82

300-mg. implants, shows that the difference between the mean pre- and post-treatment motility figures is highly significant ($t=4.08$, $n=258$, $P<0.01$).

TABLE III.—Overall Effects: Combined Results for 200-mg. and 300-mg. Implants

		Mean and S.E.	n	t	P
Volume, ml.	Before implantation	3.44 ± 0.13	177	—	—
	After	3.44 ± 0.13	143		
5-hour motility of selected group (Table II)	Before	31.55 ± 2.60	139	4.08	<0.01*
	After	47.68 ± 2.99	119		
Density (millions per ml.)	Before	29.18 ± 3.56	171	2.035	<0.05 >0.01†
	After	39.53 ± 3.57	142		
% abnormal spermatozoa	Before	35.44 ± 1.66	155	1.139	0.05
	After	37.79 ± 0.88	177		

* Highly significant. † Significant.

Density.—The combined mean densities before and after treatment with 200 and 300 mg. are shown in Table III. The difference is significant, though not highly so ($t=2.035$, $n=313$, $0.01 < P < 0.05$). However, when the differences between the mean pre- and post-treatment figures are examined for 200 mg. and 300 mg. separately (Table IV)

TABLE IV.—Effect on Density of 200 mg. and of 300 mg. of Testosterone

		Mean and S.E.	n	t	P
2 × 100 mg.	Before implantation	32.08 ± 9.20	62	0.434	0.05
	After	37.31 ± 7.56	55		
3 × 100 mg.	Before	26.62 ± 2.04	109	3.780	<0.01*
	After	40.94 ± 3.39	87		

* Highly significant.

it becomes apparent that, while for the former the difference is not significant ($t=0.434$, $n=117$, $P>0.05$), for the latter it is highly significant ($t=3.780$, $n=196$, $P<0.01$). One may conclude, therefore, that an implant of 300 mg. is superior to one of 200 mg. in its effect on sperm density.

Volume and Morphology.—It is clear, from Table III, that implantation was without significant effects on the volume of the ejaculate or on the proportion of total spermatozoal abnormalities.

Pregnancies.—The wives of 20 men became pregnant on 22 occasions, all within six months of implantation. Five of these pregnancies ended with an abortion, the incidence thus being 22.75%. This compares with an abortion incidence of 19.1% in a series of 220 pregnancies in women who attended the Fertility Clinic at University College Hospital; an incidence which, it has been shown, is probably not in excess of the general spontaneous abortion rate (Swyer, 1953). Comparison of the mean pre- and post-treatment figures for the individuals whose wives conceived showed an apparent improvement after treatment in 17 cases, no change in 4, and deterioration in 1. These results suggest that conception may indeed have been assisted by the treatment given.

Complications of Treatment.—Testosterone implantation is an innocuous, simple, out-patient procedure which entails no discomfort and does not prevent the man continuing with his work. No patients had any complaints as a result of the implantations, but extrusion of a pellet was encountered on three occasions. This incident is of no serious consequence, and merely requires the application of a dry sterile dressing until the wound has healed.

Discussion

While the statistical analysis of the results of treatment with testosterone implants strongly suggests that motility and density are, in general, improved, inspection of the individual data has made it quite clear that by no means every patient benefited. There can be no doubt that the patients in this series must have presented a very heterogeneous collection of lesions, and it is entirely probable

that testicular biopsies before treatment would have shown the unlikelihood of improvement—from any treatment—in many cases. Extreme oligospermia (mean density before treatment 5 millions per ml. or less) and extreme asthenospermia (mean five-hour motility before treatment less than 5) invariably remain unaffected by testosterone implantation. Clearly, the more the series is weighted with unsusceptible cases the less obvious will be the results of treatment; just as if, for example, in attempting to demonstrate the efficiency of penicillin in combating infections the series of cases studied contained a high proportion in which the tubercle bacillus was the infective agent.

Assuming, as appears to be justifiable, that the kind of treatment used here is effective in some cases of defective spermatogenesis, it becomes desirable to determine, so far as possible, which patients are most likely to benefit. It is difficult to lay down hard-and-fast rules, but the following impressions may offer some guidance. As mentioned above, men with extreme oligospermia and extreme asthenospermia (regardless of sperm density) are unsuitable for testosterone implantation. Moderate oligospermia (15–20 millions per ml.) with fair or good sperm activity was improved in 12 cases, remained unchanged in 3, and deteriorated in 3. Poor motility (five-hour motility 15–30) with fair or good density was improved in 14 cases, remained unchanged in 3, but deteriorated in 3 others. These two, then, would seem to be the principal varieties of seminal deficiency for which this treatment might prove of value.

It is suggested as a practical basis that three pre-treatment specimens should be examined, to obtain a fair estimate of the general characteristics of the seminal fluid, and that monthly specimens should be tested for three months after implantation. If these show improvement, but no conception occurs within six months, a further specimen should be examined. If this shows deterioration, a second implantation might be desirable. Obviously, the examination of specimens after implantation is of as much importance to the patient as of interest to the physician, since the decision to use further implants will be governed by the response, if any, to the first one.

In our present state of ignorance, no useful purpose is served by speculating on the *modus operandi* of testosterone in this treatment.

Summary

The effect of implanting two and three 100-mg. pellets of testosterone subcutaneously has been studied in 56 men presenting seminal deficiencies of one kind or another. These men received a total of 67 implants—28 of 200 mg. and 39 of 300 mg. The seminal fluid appeared to improve in 28 individuals (12 received 200 mg., 16 received 300 mg.); to be unchanged in 22 men; and to deteriorate in 6 others (1 received 200 mg., 5 received 300 mg.). No significant overall effects on volume and seminal morphology were seen, but there was a highly significant overall increase in motility with both doses of testosterone and in density with 300-mg. implants. Extreme asthenospermia and extreme oligospermia were invariably unaffected by the treatment.

The wives of 20 of the men became pregnant on 22 occasions, all within six months of implantation; 5 pregnancies ended in abortion (22.75%), the remainder going to term.

It is suggested that moderate depression of sperm density (15–20 millions per ml.) or poor motility (other than extreme asthenospermia) with fair or good density offers the best chances of improvement after testosterone implantation.

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ABDOMINAL TOPOGRAPHY IN RELATION TO SENILE OSTEOPOROSIS OF THE SPINE

BY

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It has been known for many years that there is a tendency to loss of height in late middle and old age (Roberts, 1878). Powys (1901) showed that this loss averages 0.33 in. (0.8 cm.) in every 10 years; the standard deviation of height increases with age, indicating that the rate of decline varies with the individual concerned. Progressive wasting of tissue and the develop-



FIG. 1.—An extreme example of the deformity produced by descent of the thoracic cage into the cavity of the false pelvis.

ment of senile kyphosis of the spine have been regarded as the main factors involved. As a result of these changes there is an approximation of thoracic cage and pelvis (Brown and Smith, 1945), and in some individuals the costal margin may sink into the cavity of the false pelvis. An extreme example of this deformity is shown in Fig. 1. The subcostal and supra-iliac lines, traversing the lowest points of the thoracic cage and the highest points of the iliac crest respectively, were originally employed in abdominal topography as the upper and lower boundaries of the umbilical and lumbar regions. Cunningham (1893) showed that these boundaries were unsatisfactory because the distance between them was so variable that in certain individuals the regions so delineated were extremely narrow or even absent. The more widely separated transpyloric and intertubercular lines have now replaced the older boundaries (Gray's Anatomy, 1949), but are more difficult to define in routine clinical examination. The approximation of ribs and pelvis in elderly patients results in increased abdominal protuberance and may make detailed palpation of the lumbar regions very difficult. It has even been known to cause acute intestinal obstruction as a result of incarceration of gut between the ribs and the walls of the false pelvis (E. C. Hutchinson, personal communication, 1952).

Previous workers have considered that the main aetiological factor is an increased obliquity of the ribs due to senile kyphosis and muscular weakness, but few accurate observations have been made. The present paper records the results of an investigation of the extent, causation, and possible clinical significance of this anatomical change in the aged.

Methods

Observations were made on 340 subjects (152 male and 188 female). Only adults were studied, and almost all were chronic cases in hospital, with an average length of stay of 2.5 years. This makes the results inapplicable to the general population, the changes due to ageing being probably more extreme in these subjects than in the average. All adult age groups were included, but there were a great many elderly subjects, resulting in a high average age of 68 years. In all cases accurate measurements of the height of the patient and the distance between the subcostal and supra-iliac lines were made. The latter measurement is here termed the "pelvi-costal distance," and the ratio of this to the height of the patient the "pelvi-costal ratio." The convention was adopted of recording these values as negative in the individuals in whom the subcostal line was lower than the supra-iliac line, this extreme deformity being found in only four patients.

As the investigation was designed to study the causation and significance of a low, zero, or negative pelvi-costal ratio, all individuals with a value of this ratio below 1% were subjected to full radiological examination of the lumbar and dorsal spine. This sample consisted of 22 males and 32 females, and, as expected, contained a disproportionate number of elderly patients, the average age being 74. A group for comparison was taken from the remaining 286 patients. This group was selected to contain exactly the same number of males and females as the previous group and to have precisely the same age distribution, the method of random numbers being employed in choosing between suitable individuals. It follows, therefore, that the two groups were exactly comparable except that the former consisted only of individuals with an abnormally low pelvi-costal ratio and the latter with an average ratio for the age group concerned. These two groups will subsequently be referred to as the "cases" and the "controls."

The following measurements were considered to be possible factors in the production of an abnormally low pelvi-costal ratio, and were obtained directly from the x-ray plates: (a) the angle between the lower ribs and the anterior border of the lower dorsal spine; (b) the degree of lumbar lordosis expressed as an angular measurement; (c) the length of the lumbar spine; (d) the proportion of the lumbar spine occupied by the intervertebral disks; and (e) the degree of spinal osteoporosis.

The last factor is very difficult to express in a quantitative manner, as has been well discussed by Lachmann and Whelan (1936). It was thought impossible to assess the degree of osteoporosis directly from the radiological density of the vertebral bodies, since this is partly dependent on factors which are difficult to control, particularly the exact photographic exposure and the radiological density of soft tissue superimposed on the vertebral shadow. The effect of osteoporosis on the shape of the vertebral body—that is, the production of biconcave or "fish-" vertebrae—was therefore chosen as the index of its degree. The most accurately centred lumbar and dorsal vertebrae were chosen in the lateral films, and the heights of the anterior and posterior borders and the minimum height near the centre of the vertebra were measured. The amount of biconcavity was expressed as the ratio of the minimum height to the average of the anterior and posterior heights, this ratio diminishing with increasing osteoporosis. An assessment of a single accurately centred vertebra was necessary, since parallax effects make similar measurements erroneous in other vertebrae. In practice there was no difficulty in

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deciding which vertebrae were the best-centred, and, with the particular radiological technique employed, these were the eighth or ninth dorsal and the third or fourth lumbar vertebrae in the two lateral films used.

Finally, the length of stay in hospital was recorded as an estimate of the degree of immobilization. Although the great majority of the patients were not confined to bed, their activity in hospital was much less than would be likely in similar individuals in their own homes. Standard statistical methods (Snedecor, 1946) were employed in the analysis of the results.

Results

A preliminary inspection of the means of the pelvi-costal ratios of patients classified in decennial age groups (Table I) showed that there was a sudden decrease in the seventh decade. In order to decide whether the decrease of this

TABLE I

Age Group	Males		Females	
	No. of Patients	Mean Value of Pelvi-costal Ratio	No. of Patients	Mean Value of Pelvi-costal Ratio
<41	13	1.9%	7	2.4%
41-50	10	1.9%	22	2.5%
51-60	18	2.2%	24	2.6%
61-70	33	1.7%	32	1.8%
71-80	49	1.6%	52	1.8%
81-90	28	1.6%	49	1.7%
>90	1	—	2	1.7%
Total	152	1.75%	188	2.0%

TABLE II

Sex	Age Group	Mean Value of Pelvi-costal Ratio	Difference	Degrees of Freedom	t Value	P
Males	Below 65	2.04%	0.43	51	3.2	<0.01
	Above 65	1.61%		99		
Females	Below 65	2.47%	0.76	64	4.5	<0.001
	Above 65	1.71%		122		

ratio with age was statistically significant, patients below the age of 65 were compared with those above this age (Table II). It will be seen that the difference between these two age groups is highly significant in both sexes. The results are summarized in the distribution curves in Fig. 2. The distribution in females has a larger mean and scatter and is more skewed than in males owing to the comparatively large number of individuals with a high ratio in the former sex. This may possibly be connected with the greater lumbar lordosis of the female, but there were too few x-ray films taken of individuals with a high pelvi-costal ratio to assess this aspect of the problem. Relevant statistical values of the distribution curves in the two sexes are given in Table III. The curve in males does not differ significantly from a normal distribution, while that for females is clearly skewed, so that the modal value is much less than the mean.

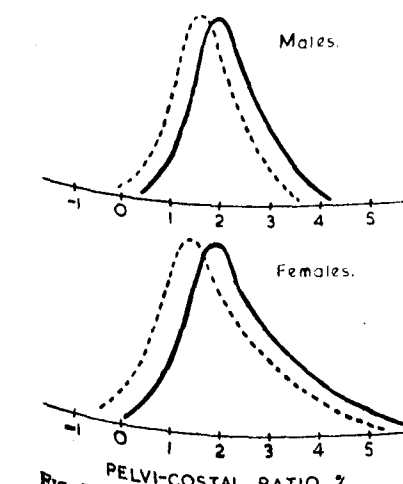


FIG. 2.—Distribution curves of the values of the pelvi-costal ratio in male and female patients. Continuous line=under the age of 65. Broken line=over the age of 65.

TABLE III

Sex	Mean Value of Pelvi-costal Ratio	Standard Deviation	Skewness		
			Statistic g_1	t Value	Probability
Male	1.75%	0.87	0.2	1.0	0.4 > P > 0.3
Female	2.0%	1.17	0.5	2.8	P < 0.01

Although the "t test" is not strictly applicable to such a skewed distribution, it was shown to be valid by repeating the test with derived logarithmic values of the pelvi-costal ratio, which gave a strictly normal distribution. A similar t value and probability was thereby obtained.

In the comparison of radiographs of the cases having an abnormally low pelvi-costal ratio with those of the controls no significant difference was found in the lengths of the lumbar spines, in the amount of lumbar lordosis, or in the thickness of intervertebral disks. There was, however, a clear difference in the obliquity of the ribs in the two groups. In both sexes the ribs of the cases were on an average 7.5 degrees further from the horizontal plane than those of the controls (t value=2.8; P<0.01).

There was a significantly greater degree of osteoporosis as measured by biconcavity of lumbar vertebrae in the cases. A summary of the statistical analysis of this comparison is given in Table IV. The difference was more striking in

TABLE IV

Portion of Spine	Samples of Patients	Mean of Index of Biconcavity %	Difference	t Value	Probability
Dorsal	Cases Controls	79.7 82.2	2.5	1.6	P=0.1
Lumbar	Cases Controls	69.8 76.2			

females, eleven of whom were found to have a degree of lumbar osteoporosis of severity sufficient to give an index of biconcavity of less than 67%. All of these were in the group of cases and none in the controls. A comparison of the measurements of the dorsal vertebrae shows a similar tendency, but the difference is not quite significant at the conventional one-in-twenty degree of probability. There was striking biconcavity of vertebrae in most of the spines, the average ratio of the central height to the mean of the anterior and posterior heights of the lumbar vertebrae examined being 73%. This result is almost certainly inapplicable to a healthy elderly population, being an indication of the tendency of patients with long-term illness to develop osteoporosis as a result of relative immobility. In six of the patients examined by radiology the pathological process had progressed further and caused actual collapse of one or more vertebral bodies, almost invariably in the upper lumbar or lower dorsal regions, this being the usual location for this complication (Fairbank, 1951). Three of these were in the group of cases and three in the controls. In almost all the patients the cause of the "fish-vertebrae" appeared to be uncomplicated senile osteoporosis, but in two patients there was Paget's disease with a superimposed osteoporosis; in a third the characteristic changes of ankylosing spondylitis were found; and in the youngest individual amongst the cases osteomalacia secondary to idiopathic steatorrhoea was shown to be the cause.

Rather paradoxically, no correlation was found between the degree of biconcavity of vertebrae and the age of the patients. This is probably explained by the fact that almost all the patients examined radiologically were over the age of 65 and that a maximum change is reached at an earlier age in long-term invalids than in the healthy population. There was only a slight correlation between length of stay as an in-patient and degree of osteoporosis ($r=+0.20$), and this did not differ significantly from zero correlation. It was, however, realized that length of stay was a very poor

estimate of immobilization; but it was the best available in elderly patients usually incapable of giving a satisfactory account of their activity prior to admission.

Discussion and Summary

The results demonstrate that there is a tendency to approximation of the thoracic cage and pelvis with increasing age. The most important factor involved is an increased obliquity of the ribs, which is, at least in part, secondary to the development of senile kyphosis. Radiological evidence of senile osteoporosis is more likely to be found in individuals in whom this change is greater than the average. The explanation may be that osteoporotic shortening of the spine is a further factor in causing this approximation, but, alternatively, it is possible that the rather asthenic type of elderly individual, in whom obliquity of the ribs is above the average, is constitutionally more liable to develop senile osteoporosis.

Senile osteoporosis of the spine is shown to be very common in elderly chronic invalids; indeed, some degree of osteoporosis is almost universal. As in so many other medical conditions, however, it is impossible to define any sharp boundary between the normal ageing process in the spine and pathological osteoporotic change. There is a gradual and continuous variation between spines which, at one extreme, can be regarded as normal for the age group, and those at the other extreme which show severe unequivocal pathological osteoporosis.

From a practical clinical point of view, it can be stated that there is a fair likelihood that spinal osteoporosis of significant degree will be found in elderly individuals in whom the distance between the subcostal and supracostal lines is less than 1% of the patient's height, corresponding in most cases to a distance of $\frac{1}{2}$ in. (1.3 cm.) or less.

We are indebted to Mr. K. Bray for carrying out the radiography and to Miss Perry for the clinical photograph.

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The third annual report of the British Empire Society for the Blind was published last week. Preliminary surveys have shown that more than a million people in the Colonies are blind, millions more have incapacitating eye diseases, and facilities are gravely inadequate. Most probably, according to the report, three-quarters of this blindness is preventable. The report describes the start of a systematic attack on "river blindness" (a variety of filariasis affecting the eyes) in West Africa. The disease is spread by a simuliid fly. At least 100,000 people in the northern Gold Coast are victims of the disease, which in the past has depopulated whole villages. The Society has sent two teams, one medical under Dr. F. Rodger, an ophthalmologist, and the other composed of entomologists, to survey the problem in the Gold Coast, the Cameroons, and Northern Nigeria. One of the objects of the survey is to obtain exact information on the life history of the vector fly. In East Africa, where conditions are rather easier, treatment of the rivers with insecticides has been followed by a notable reduction in river blindness. Trachoma is another very important cause of blindness, and a pilot survey at Aden last year showed that in some villages everyone had it in some form or another.

ACTINOMYCOSIS IN SCOTLAND

BY

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Since 1891, when Wolff and Israel first isolated the causative organism of actinomycosis, *Actinomyces israeli*, much has been written on many aspects of this disease, but the literature reveals little information regarding its incidence. It is not surprising, therefore, to find in one textbook the statement that it is "not a common disease" (Topley and Wilson, 1946), and in another that it is "not infrequent" (Christian, 1947).

Most people will agree with Cope (1949) that "we must put aside the traditional and popular fairy-tale about infection from grass and straw," since from these sources aerobic actinomycetes only have been isolated. It is now commonly held that the infection is endogenous, arising from the micro-aerophilic actinomycetes found in the human mouth, which resemble closely the pathogenic *Actinomyces israeli*. Associated with the exogenous theory of infection was the suspicion that agricultural workers were more often the victims of this disease than those in non-agricultural occupations. Although our ideas regarding the origin of the infection may have changed, it does not necessarily follow that our views concerning the occupational incidence of the disease must also alter. The question of whether agricultural workers are in fact more prone to actinomycosis than others has not so far been satisfactorily answered. Before it can be it is necessary to relate the number of cases of the disease occurring in agricultural and non-agricultural workers to the total number of individuals at risk in the two groups in the area under consideration. A survey of actinomycosis in the north-east of Scotland in which particular attention was paid to this point has already been recorded (Porter, 1951). In view of the fact that the north-east of Scotland is predominantly agricultural it has seemed desirable to extend this survey to the rest of Scotland, in which there is a large industrial belt in addition to agricultural areas.

Investigation

The extended survey was designed to cover all cases of actinomycosis admitted to hospital for treatment during the thirteen years from 1936 to 1948 in those parts of Scotland not originally reported upon—that is, in the whole of the country excluding the five counties in the north-east. Information was sought from all general hospitals and from x-ray therapy departments. Not all the hospitals were able to provide the desired information, sometimes because of inadequate case records and sometimes on account of the absence of comprehensive filing systems covering the period under review.

It is recognized that a number of patients with actinomycosis in its less acute forms may have been treated at home by their own physicians and received no hospital treatment. Such are not included in the survey, and no systematic search of the records of the out-patient departments of the various hospitals was attempted. A few out-patient cases of the disease which had been referred to x-ray therapy departments for treatment were obtained from the records of these departments, and these have been included.

Any case lacking bacteriological or pathological confirmation of the clinical diagnosis has been excluded; likewise a few cases whose normal residence was not in Scotland

Results

The results of this investigation have been combined with those of the previous survey of the north-east area in order to give an overall survey of actinomycosis in Scotland. Where necessary, figures for each of the surveys are given separately so that they may be compared.

The total number of cases for the whole of Scotland was 186, of which 98 came from the north-east area and the remaining 88 from the rest of Scotland. In view of the fact that at the 1931 Census the population of the five north-east counties (Aberdeen, Kincardine, Banff, Moray, and Nairn) was 444,000, compared with 4,398,000 for the rest of Scotland, it is surprising that the north-east area should account for more than half the total number of cases recorded. Even if allowance is made for the fact that 15.8% of the hospital beds in the rest of Scotland were not covered, there would still appear to be a disproportionately large number of cases from the north-east area.

Location

In a report from the Netherlands, van der Hoeden (1939) stated that actinomycosis was ten times as common in rural districts as it was in large towns. The 186 cases of actinomycosis in this survey were grouped according to whether these patients lived in large towns or not. Thirteen cases had occurred in members of the armed Forces, and, owing to the uncertainty of their location prior to admission to hospital they have been excluded, leaving 173 cases for consideration. The results show that there was no significant difference in the rate of attack between those resident in the large towns and those in the small towns and rural districts in the north-east area. However, when the rest of Scotland is considered it appears that there is a significant difference between the attack rate among residents of large towns and that among residents in smaller towns and rural districts: the disease is more prevalent in the latter group.

Age Incidence and Sex

The ages of 184 of the 186 cases are known, and their distribution in the various age groups is shown in the Chart. The maximum number of cases occurred in the 20-29 age

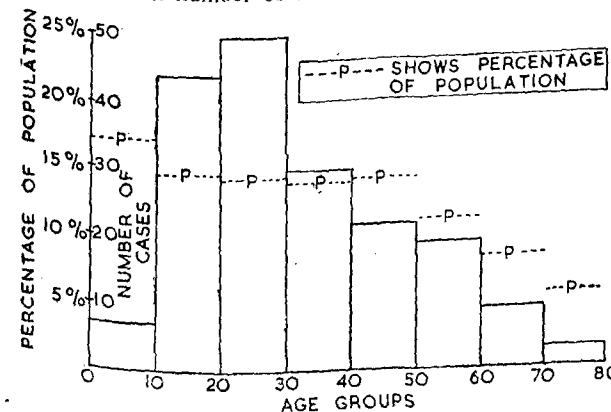


Chart showing distribution of 184 cases in age groups.

group. The combined number of cases in the 10-19 and 20-29 age groups is 94—just over half the total number. The percentage of the population in each age group is marked on the chart, and it can be seen that in the 10-19 and 20-29 age groups more cases of actinomycosis have occurred than would have been expected from the numbers of the population in these age groups.

Males are more commonly affected than females, as borne out by the fact that of the 186 cases 145 (78%) were males.

Anatomical Distribution and Incidence of Trauma

The cervico-facial region is the most commonly affected portion of the body (65%), followed by the abdominal region, which accounted for 19% of the infections. Actinomycosis

of the cervico-facial region had occurred after dental extractions on 22 occasions, and in a further 33 patients in whom carious teeth had been noted. There was a history of injury to the face in 5 cases. In 23 of the abdominal cases there was a history of an associated appendicectomy, and in 2 cases of an appendix abscess. It is commonly agreed that actinomycosis may follow or be associated with appendicitis. Two cases of abdominal actinomycosis followed gastric perforations, and in 3 cases a blow to the chest or abdomen had preceded the onset of the disease.

Occupational Incidence

The occupations of 173 of the 186 cases are known. The occupation which accounted for the largest number of cases was agriculture, which gave a total of 39, two of which were under 16 years of age. Since opinion in the past has been divided on the question of whether agricultural workers are more liable to this disease than those in non-agricultural occupations, it was thought desirable to submit the figures resulting from this survey to statistical analysis. The numbers of those engaged in agriculture and in non-agricultural occupations in Scotland between 1936 and 1948 were obtained through the courtesy of the Ministry of Labour. Only males between the ages of 18 and 64, of which there were 88, were subjected to this analysis. The probability was calculated, and showed that, in Scotland, males between the ages of 18 and 64 engaged in agriculture were more liable to develop actinomycosis than those in non-agricultural occupations. The attack rate for male agricultural and non-agricultural workers in the two areas of Scotland are given in the accompanying Table.

Table Showing Attack Rate of Actinomycosis in Scotland of Male Workers

	North-east Area		Rest of Scotland		Total	
	Cases O.M.	Ratio per 100,000	Cases O.M.	Ratio per 100,000	Cases O.M.	Ratio per 100,000
Agricultural workers	19	146	18	29	37	50
	(13,000)		(62,000)		(75,000)	
Non-agricultural workers	20	33	31	3.3	51	5.2
	(61,000)		(919,000)		(980,000)	

O.M. = Occupied males.

Discussion

Our knowledge of actinomycosis has increased greatly during the last 60 years, but there are still many questions to which answers are required. The theory of endogenous infection is now accepted by most workers in this field. *Actinomyces israeli* has been isolated, in the absence of clinical actinomycosis, from carious cavities, from periodontal abscesses, from dental deposits, and from tonsils. Its existence in the mouth offers a possible explanation of the frequency with which the cervico-facial region and the gastro-intestinal tract are affected. It would appear from investigations concerned with the isolation of micro-aerophilic actinomycetes from the mouth that these organisms have been recovered in only some 5% of instances. Thus Lord and Trevett (1936) isolated four strains of anaerobic actinomycetes from dental scum and carious teeth of 90 patients, while Sullivan and Goldsworthy (1940) isolated five strains of anaerobic actinomycetes from 100 periodontal abscesses and one strain from 24 carious teeth. However, Emmons (1937) isolated micro-aerophilic actinomycetes in 23% of cultures from 100 pairs of tonsils.

No details are given of the sex and age of the patients mentioned in these investigations. In view of the fact that this disease is more common in males and in those in certain age groups, it would be of much interest to know if micro-aerophilic actinomycetes are present more often in male than in female mouths, and in certain age groups more often than in others; also if mouths of agricultural workers and rural residents harbour this organism more commonly

than mouths of non-agricultural workers and residents of the larger towns. Such information might be helpful in revealing factors which have so far not been taken into account in working out the epidemiology of this disease.

Although it has been found that male agricultural workers are more liable to actinomycosis than male workers in non-agricultural occupations it does not mean that we must connect this disease with the aerobic actinomycetes found in grains or grasses or even with the presence of the anaerobic *Actinomyces bovis* of lumpy jaw in cattle. Erikson (1940) made a detailed study of 20 strains of micro-aerophilic actinomycetes, 15 of which were of human origin and 5 of bovine origin. She showed that there were certain morphological, physiological, and serological differences between the human and bovine strains. Slack *et al.* (1951), however, in an examination of 11 human strains and 5 bovine strains isolated from cases of actinomycosis showed that they were serologically related. There is little information available concerning the frequency of actinomycosis in cattle and no evidence as yet to warrant connecting bovine with human cases of the disease. The lack of knowledge of the epidemiology of the disease in cattle would appear to be as great as it is in the case of the human subject.

Summary

A survey of the occurrence of actinomycosis in Scotland during the 13 years from 1936 to 1948 revealed 186 cases. All had bacteriological or pathological confirmation of the clinical diagnosis.

The commonest site of infection was the cervico-facial region, and males were more often affected than females.

Male agricultural workers were found to be more liable to this disease than those in other occupations. There was no significant difference in the attack rate of the residents of the larger towns and rural areas in the north-east of Scotland, but the residents of the larger towns in the rest of Scotland were found to be much less frequently the subjects of this disease than those living in essentially rural areas.

I wish to thank the medical superintendents of the various hospitals in Scotland and their records staff for help in obtaining the information on which this paper is based. For advice and assistance on statistics I am grateful to Mr. H. Campbell, Nuffield Department of Industrial Health, King's College, Newcastle-upon-Tyne.

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The City Council of Nottingham has recently published an attractive handbook describing the facilities available in the city for users of the National Health Service. The book opens with a brief summary of the medical services during the last hundred years up till 1948. It then describes in simple terms what maternal and child welfare facilities there are in Nottingham, and gives a detailed account of the work of the health visitors, midwives, district nurses, and home helps. In a chapter entitled "Care Service" the book tells of the services for the prevention of illness, by immunization and vaccination, and the control of the spread of tuberculosis and other infectious diseases. There is also a short description of the sanitary services and of the council's efforts to promote smoke abatement and slum clearance. The handbook concludes with the addresses of hospitals and clinics in and around Nottingham where different kinds of treatment may be obtained.

SPECIFIC BACTERIOLYSIN IN SUBACUTE BACTERIAL ENDOCARDITIS CAUSED BY A HAEMOLYTIC STAPHYLOCOCCUS ALBUS

BY

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This report records a case of subacute bacterial endocarditis (S.B.E.) in which there was serological evidence that the causal organism was a haemolytic coagulase-negative strain of *Staphylococcus albus*. So far as can be ascertained, serological evidence of infection in S.B.E. has not been recorded previously. The particular interest in this case was the presence of a specific bacteriolysin in the serum.

Between 1945 and 1952 British and American literature recorded over 30 cases of S.B.E. due to coagulase-negative white staphylococci, and it has been suggested (Dowling *et al.*, 1952) that this type of endocarditis may be increasing in frequency. Out of a total of 2,100 cases of S.B.E. reported in five reviews (Thayer, 1931; Perry, 1936; White *et al.*, 1945; Priest *et al.*, 1947; Cates and Christie, 1951), *Staph. albus* was the causal organism in 20 instances—that is, about 1%. Individual cases are reported from time to time (for example, Cunliffe *et al.*, 1943; Matthew, 1951; Cobb, 1952), and serve to emphasize the fact that *Staph. albus* should not be regarded invariably as a contaminant when found in the blood cultures from these cases.

Case Report

The patient, a married woman aged 33, had a long "rheumatic" history, having had three attacks of acute rheumatism at 14, 27, and 29 years. Between 1947 and 1950 she was admitted to hospital on four occasions, suffering from various degrees of cardiac failure, with mitral stenosis and fibrillation. In 1947 and 1948 she was in hospital for some weeks; rapid improvement was brought about with rest and digoxin therapy.

On April 13, 1949, she was admitted to hospital for the third time, again with severe fibrillation; as before, this was treated with digoxin. Improvement was rapid, but on May 9 it was found that the spleen was enlarged to one and a half fingerbreadths below the costal margin. A persistent anaemia (Hb, 7 g.), very marked clubbing of the fingers, and prominent nodules over the elbows were also found. It was thought possible that an early subacute bacterial endocarditis was present, despite the fact that the patient was afebrile, and a series of blood cultures gave the following results:—May 10: a few colonies of haemolytic coagulase-negative *Staph. albus*; May 12: no growth; May 16 and 17: a heavy growth of a haemolytic coagulase-negative *Staph. albus*.

In vitro tests showed that the organisms isolated (presumably all the same strain) were sensitive to penicillin 1,000,000 units of penicillin daily was given when the second positive culture was reported—this was continued for five weeks. The patient's condition improved dramatically with penicillin therapy. The haemoglobin rose to 11.9 g., her weight increased, and symptoms of tiredness and malaise disappeared. Nine blood cultures taken between May 25 and July 30 were sterile. She was discharged on August 20.

Nov. 14, 1953

MEDICAL MEMORANDUM

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Medical Memorandum

Amoeboma of the Caecum

A male clerk aged 34 was admitted to hospital on November 20, 1949, with a three-days history of right-sided abdominal pain.

On examination he had a normal temperature and pulse, there was a tender mass palpable in the right iliac fossa, and the white blood cell count was 11,000. The case was thought to be an appendix abscess, and was treated with antibiotics. As there was no diminution of the mass after twenty days, an exploratory operation was performed.

Operation.—On December 9 a Rutherford Morison incision was made and a firm, rather inflamed mass was found occupying the caecum and ascending colon. This was thought to be a neoplasm or a non-specific granuloma, and the affected bowel was exteriorized after suturing the ileum to the transverse colon preparatory to a double-barrelled colostomy. Three days later the affected loop was removed and the intervening spur was crushed soon after. Within three weeks there was considerable excoriation of skin around the colostomy, and this rapidly developed into spreading infection with sloughing of the abdominal wall, which increased steadily until *Entamoeba histolytica* was identified in the skin edge and appropriate treatment given.

The condition improved gradually and sloughs separated, but a large granulating area resulted with a faecal fistula in the middle of it. Closure was effected after the third attempt some eight and a half months from the original operation. Tantalum mesh proved useful in bridging the gap in the abdominal musculature, and the skin defect was made good by sliding and grafting. Bowel action has been regular and normal ever since, but two small sinuses developed which discharged sero-sanguineous fluid but no faeces. Part of the mesh had been extruded and cut off, but it was thought best not to interfere further.

When last seen the patient was enjoying excellent health and going to business as usual.

COMMENT

This case illustrates the importance of excluding amoebiasis when doubtful masses are found in the bowel, especially in view of the relatively large number of persons who have been abroad in recent years. Amoebic ulceration of the abdominal wall seems to be more frequent in the United States—often coming on after appendicectomy in an infected case (Hunter, 1951). Hawe (1945) writes on the surgical aspects of intestinal amoebiasis, and refers particularly to the need of excluding acute caecal amoebiasis before operation for appendicitis in endemic areas. Donald (1940) describes two cases simulating carcinoma of the rectum. It would seem that the cases most likely to cause confusion in endemic areas are those of acute caecal or appendiceal amoebiasis, while the presence of unusual masses in the rectum or elsewhere in the bowel may call for a search for *E. histolytica* in the stools before proceeding to surgery.

Acknowledgments are due to my colleagues at Ashford Hospital, Middlesex, particularly Dr. K. D. Keele, for advice on treatment, and to Drs. W. J. Hamilton and C. F. Ross for pathological reports.

E. N. CALLUM, F.R.C.S.Ed.

Epsom.

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Bacteriology

When the staphylococcus was first isolated (May 10, 1950) it was thought to be a skin contaminant, as it is generally accepted that most albus strains isolated from blood cultures fall into this category. The striking feature of the organism, however, was the degree of haemolysis produced on blood agar; the zone of clearing round each colony was almost as great as that found with a haemolytic streptococcus. In other respects the organism appeared to be an ordinary albus strain; the coagulase test was negative. When similar organisms were isolated from further blood cultures (May 16 and 17) contamination seemed unlikely, and the patient's serum was investigated for antibody content.

The results of the various tests showed that the serum did not contain any agglutinins but that a bacteriolysin was present. This bacteriolysin was evidently specific for the staphylococcus isolated from the blood cultures (see Table).

Bacteriolytic Effect of the Patient's Serum on a Range of Organisms

Organism	Serum Dilutions—Reciprocals										C
	2	5	8	10	20	40	100	200	500	750	
<i>Staph. albus</i> A	+	+	+	+	+	+	+	+	±	—	—
" " B	+	+	+	+	+	+	+	+	+	—	—
" " C	+	+	+	+	+	+	+	+	+	—	—
" " 1	+	±	—	—	—	—	—	—	—	—	—
" " 2	+	±	—	—	—	—	—	—	—	—	—
" " 3	+	±	—	—	—	—	—	—	—	—	—
" " 4	+	±	—	—	—	—	—	—	—	—	—
<i>Staph. aureus</i> Oxford	+	—	—	—	—	—	—	—	—	—	—
<i>Str. pyogenes</i>	—	—	—	—	—	—	—	—	—	—	—
<i>Str. viridans</i>	—	—	—	—	—	—	—	—	—	—	—
<i>Bact. coli</i>	—	—	—	—	—	—	—	—	—	—	—
<i>B. friedländeri</i>	—	—	—	—	—	—	—	—	—	—	—

Staph. albus A, B, and C—the organisms isolated from the three positive blood cultures.

Staph. albus 1, 2, 3, and 4—four strains isolated from other patients' blood cultures and classed as contaminants. All non-haemolytic.

— = Clearing of the suspension. — = No change. ± = Partial clearing.

Similar tests were carried out with sera from 12 other patients, including two known cases of S.B.E. due to *Streptococcus viridans*, with negative results. The bacteriolysin was still present in the patient's serum several weeks later, but the lytic titre had fallen to 1:4 within three months. The haemolytic activity of the organism gradually diminished after several months' storage on Dorset's egg medium, and had almost disappeared when examined three years after isolation.

Comment

The anaemia in this case was no doubt due to the haemolytic activity of the staphylococcus: the occurrence of a haemolytic strain of *Staph. albus* in S.B.E. has been noted previously by Allen and Riecker (1949). The development of specific bacteriolysin does not appear to have been reported in other similar cases, and may be a purely isolated finding. Absence of post-mortem data makes it difficult to assess the effect of the septicaemia on the course of the patient's illness, but the degree of cardiac damage was so great that it is feasible to assume that early death was inevitable, irrespective of the blood infection.

We wish to thank Dr. E. Oastler, in whose wards this case occurred, for permission to make use of clinical notes.

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Reviews

WILLIAM CHESELDEN

William Cheselden, 1688-1752. By Sir Zachary Cope, M.D., M.S., F.R.C.S. (Pp. 112; 20 figures. £1.) Edinburgh and London: E. and S. Livingstone. 1953.

Although William Cheselden is still, after 200 years, accounted one of the major glories of St. Thomas's Hospital, this volume, written by a consulting surgeon to St. Mary's Hospital, appears to be the first fully documented life to have been published. The author's 1952 Vicary Lecture is the basis, to which he has added much new material resulting from his original researches.

Little is known of Cheselden's early life. Born in the year of the "Glorious Revolution," he lived through the Augustan period of our history, dying in 1752 acknowledged by all (as the *D.N.B.* states) to be the leading surgeon of his age.

For some years before his election to the staff of St. Thomas's Cheselden had conducted regular anatomy classes, which were so successful as to become a necessity for London medical students to attend. He was the first man in this country who insisted on the importance of a sound knowledge of anatomy for the student, and on dissection rather than books for this knowledge. It was some years later that William Hunter, to whom the credit for this innovation is generally incorrectly given, followed where Cheselden had led. He also incorporated in his lectures all that was known of physiology, and was thus the first to conceive the great importance of the preclinical sciences to the medical student. He wrote a famous textbook of anatomy as a companion to his lectures, and this work achieved such popularity that it maintained its place for more than a century. Later he published his great work on the bones of the body, *Osteographia*, and, being no mean artist, he personally assisted in the drawing and the engraving of the illustrations.

In addition to his pre-eminence as a general surgeon—and his speed and success in cutting for the stone had no equal in pre-anaesthetic days—he was a pioneer in ophthalmology. In this connexion his friend Pope wrote:

I'll do what Mead and Cheselden advise
To keep these limbs and to preserve these eyes.

At the height of his fame he retired suddenly from the staff of St. Thomas's (just before Percivall Pott was appointed to the staff of Bart's), and took the post of resident surgeon to the Royal Hospital, Chelsea, in order to obtain the necessary time to devote to his great project of separating the Barber-Surgeons Company, of which he was a warden, into its constituent halves. This he achieved by Act of Parliament in 1745, thus freeing surgery for future progress. He was elected to be second Master of the new Corporation of Surgeons.

In addition to his professional attainments Cheselden understood something of architecture and was largely responsible for the plans of the new Surgeons' Hall which was to house his Corporation, as well as those of the new Fulham Bridge, of which he had been elected a commissioner.

In his lifetime he was much liked for his good nature and generosity, and although his professional success aroused jealousy and criticism he refused to be drawn into controversy. Socially he was, unlike most surgeons at that time, born armigerous, and throughout his life in London he was the friend and companion of the "master-spirits" of the age of intellect—such men as Pope, Richardson, and Arbuthnot. He was appointed surgeon to Queen Caroline a few months after her accession, and on several occasions refused the honour of a baronetcy. He became a Fellow of the Royal Society in 1712, and with Dr. Mead attended its veteran president, Sir Isaac Newton, in his last illness.

He died while on a visit to Bath. The *Gentleman's Magazine* described his end as follows: "Mr. Cheselden Esq. an eminent anatomist, lithotomist and surgeon to the

Royal Hospital, Chelsea . . . had drunk ale after eating hot buns, upon which being very uneasy he sent for a physician who advised vomiting immediately, which advice, had he taken it, it is tho't, might have saved his life." A sad ending to such a distinguished life.

This book, which is well illustrated, should be read by all surgeons, St. Thomas's men, and others who respect the traditions upon which the art and science of medicine (and surgery) are built.

W. S. C. COPEMAN.

MEDICINE IN GENERAL PRACTICE

Modern Treatment: A Guide for General Practice. By 53 Authors. Edited by Austin Smith, M.D., and Paul L. Wermer, M.D. (Pp. 1,146. 147s.) London: Cassell and Company. 1953.

This impressive volume to which 53 American postgraduate teachers contribute is edited by the editor of the *Journal of the American Medical Association* and the secretary of the Association's Committee on Research. It is much more than a textbook of treatment, since considerable space is devoted in each section to physiology, aetiology, pathology, and symptomatology in order that the subsequent discussion of treatment should be rational and not empirical. The work is really a textbook of medicine with emphasis on treatment. In addition chapters are devoted to the principles of pharmacology, immunology, radiology, laboratory procedures, inhalation therapy, and physical medicine, and to the simple surgical, dermatological, and ophthalmological therapeutic principles with which the general practitioner should be conversant.

It is emphasized throughout that the patient should be treated as a whole man and not as a diseased heart, stomach, or lung, and that therapeutics is much more than the prescription of symptomatic or specific medicines. Indeed, the number of drugs mentioned is remarkably small in a book of this size on treatment. In each discussion attention is focused on what, in the author's judgment, is the most effective treatment, but alternative forms of therapy are also critically considered. That there should, here and there, be recommendations with which the reviewer disagrees is only to be expected, but the standard is everywhere worthy of the distinguished authors. All the sections are up to date, well and interestingly written, scientific and yet full of sound practical common sense. The book is beautifully produced and printed. The trouble is that therapeutics is expanding so rapidly that in a few years the work will in parts be out of date, and under the circumstances seven guineas is a lot of money to pay for it.

D. M. DUNLOP.

TOXIC PESTICIDES

Toxic Hazards of Certain Pesticides to Man: Together with a Select Bibliography on the Toxicology of Pesticides in Man and Mammals. By J. M. Barnes. World Health Organization Monograph Series No. 16. (Pp. 129. 7s. 6d.) Geneva: World Health Organization. 1953.

Although pesticides and fungicides have been in use since 1880, the rapid spread of their application on a vast scale has made necessary the fullest possible knowledge of their potential capacity to injure the health of mankind if their object is to be achieved. This object is twofold—the suppression of insect-borne diseases of man, and the reduction of damage to crops sufficiently to ensure adequate nutrition of the world population.

Dr. J. M. Barnes gives us here a timely and valuable contribution to the subject. The book is intended not only for the users of these substances, but also for medical officers and others responsible for public health.

Some countries have attempted legislative control of the new organic pesticides, but a high degree of legal control is difficult, and reliance must be placed largely on the education and training of those who manufacture and apply these poisons. Dr. Barnes frankly admits that there are still many uncertainties about the exact mode and site of

action and even of the precise chemical structure of some of the pesticides, particularly those belonging to the chlorinated hydrocarbon group, of which D.D.T. is a representative. The action of the organo-phosphorus group, including "parathion," is better understood; they act by inhibiting the enzymes which hydrolyse acetylcholine, while the dinitro-derivatives raise the metabolic rate by disturbing vital enzymes and accelerating oxidative mechanisms.

The description of these and other pesticides, as complete as possible in view of the existing gaps in present knowledge, is accompanied by suggestions for control of potential hazards and recommendations for further research, and is completed by an extensive bibliography drawn chiefly from sources in the library of the World Health Organization.

ETHEL BROWNING.

PSYCHOLOGY OF PHYSICAL ILLNESS

Psychology of Physical Illness: Psychiatry Applied to Medicine, Surgery and the Specialties. Edited by Leopold Bellak, M.D. (Pp. 243. £1 17s. 6d.) New York: Grune and Stratton. London: J. and A. Churchill. 1952.

Apart from the introduction by the editor, this book contains articles on the psychological aspects of general practice, internal medicine, malignancy, general surgery, plastic surgery, gynaecology and obstetrics, genito-urinary diseases, orthopaedics, the ear, nose, and throat, neurology, paediatrics, dermatology, dentistry, and the personality of the physician. Of the authors, some well known in their own fields, nine graduated from American schools, the rest from Vienna, Leyden, Prague, Lausanne, Edinburgh, and Groningen. Of the sixteen co-authors nine are psychoanalysts, and most of the remainder have received psychoanalytic training.

These arid details are provided so that the prospective reader may realize how broad are the fields of subject-matter covered, how widely different the backgrounds of the authors, how monotonously uniform their approach. By far the best are the articles written not by psychiatrists and psychoanalysts but by practical workers in the specialty concerned who have merely turned their attention to its psychological aspects. Thus the article by Dr. Haas on psychiatric implications in gynaecology and obstetrics is outstandingly good, and will certainly interest the general medical reader. In much of the rest of the book there is a deficiency of practical clinical knowledge, an excess of theoretical commonplace. Particularly disappointing is the discussion on the psychiatric aspects of neurologic diseases, which is mainly confined to the emotional meaning of illness to the patient. One might have hoped for some discussion of the varieties of psychological experience associated with lesions of particular parts of the brain—for example, the temporal lobe—or with particular types of disturbance of brain function.

ELIOT SLATER.

BIOCHEMICAL TESTS

Scope and Interpretation of the Commoner Biochemical Tests. (Pp. 120. 10s. 6d.) Johannesburg: South African Institute for Medical Research. 1953.

This book gives a judicious account of most of the common biochemical tests, and the author makes no exaggerated claims. Two general criticisms can be made. In the first place, it is now felt that it is not enough merely to give the extreme range of values found in apparently normal subjects. Either some indication should be given of the probability of values that differ from the mean by various amounts, or, at least, the range found in 80 or 90% of normal subjects should be given. It may be possible that total plasma protein as low as 5.6 g. per 100 ml. (the lower level of normal given in this book) may be found in an occasional healthy individual, but such a value should certainly suggest that something was wrong. The second general criticism is that often the author gives no indication of the levels that may be expected in disease.

Certain mistakes and omissions may be noted. Reduction of serum calcium, other than the moderate reduction due to low serum proteins, is not commoner in nephrosis than in nephritis (p. 3). Cholesterol is said (p. 6) to be 30 mg. lower in plasma than in serum; surely this should be lower in whole blood than in plasma. "Secondary prostatic carcinoma" (pp. 10, 92) should presumably be "prostatic carcinoma with secondaries." Estimations of uric acid in serum are more satisfactory than estimations in whole blood. The reader is given little help in choosing between many liver-function tests. Too little is said about tests of water and salt balance.

J. R. MARRACK.

COMPRESSION ARTHRODESIS

Compression Arthrodesis: Including Central Dislocation as a Principle in Hip Surgery. By John Charnley, F.R.C.S. With a chapter on Mechanics by Professor J. A. L. Matheson, and Histological Observations by Professor S. L. Baker. (Pp. 264; 208 figures. £2 2s.) Edinburgh and London: E. and S. Livingstone. 1953.

Mr. Charnley recently stimulated us with an excellent book on the manipulative treatment of fractures. This new volume is a tribute both to his industry and to his versatility.

Compression arthrodesis of the knee has become the accepted technique in Britain because of its simplicity, its certainty, and the speed of union. The author discusses its application to the other joints commonly arthrodesed, but no other joint lends itself quite so easily to this technique as the knee. Charnley has investigated the result of compression in great detail, and its value in accelerating union of cancellous bone seems undeniable. One is still left in some doubt whether compression has a specific effect in stimulating osteogenesis, or whether the complete absence of a gap between the surfaces allows rapid bone union. Whatever the explanation, there is no doubt that this happens at an astonishing speed. This is a delightful book to read and is coloured by the author's vital and forthright comments.

J. I. P. JAMES.

DATA ON RADIOTHERAPY

Roentgen, Radium and Radioisotope Therapy. By A. G. Delario, M.D. (Pp. 371; 65 illustrations. 55s.) London: Henry Kimpton. 1953.

This book is remarkable as a collection by one man of facts, figures, graphs, and tables published before 1951 relevant to radiotherapy. As a radiotherapist I can appreciate to the full the value of the store of easily accessible and thoroughly practical information which the book contains, since in it the necessary data are available for deciding on physical factors required in the treatment of almost any case of malignant or non-malignant condition by x rays, radium, or radioactive isotopes. While everyone would not agree with all his suggested doses, all would not necessarily disagree. For instance, I should consider 600 r in six doses of 100 r inadequate for ankylosing spondylitis. The danger of this work is that it might lead the inexperienced to proceed with more certainty than is justified if used in clinical work. Knowledge of technical details is no more a substitute for clinical knowledge and experience in radiotherapy than it is in surgery, and any tendency to ignore this axiom must be deplored. Dr. Delario would, I am sure, be the first to agree with this, since the parts of the book not filled with other people's data contain passages giving glimpses of his comprehensive grasp of the subject.

The book makes me anxious to meet its author, to find out what manner of man he is who displays such industrious ability, eclipsing even that of his *Handbook* of 1938. It is more difficult for me to assess its value to biologists than to medical practitioners, but I feel that no one interested in radiotherapy, the action of radiations, or in the use of radio isotopes would be wasting his money if he bought the book as a work of reference in which to find important technical details at a moment's notice.

FRANK ELLIS.

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SURGICAL TREATMENT OF MITRAL STENOSIS

A large number of mitral valvotomies have now been performed at many centres both here and abroad, and the operation is firmly established as a successful, and relatively safe, method of treatment. After a few pioneer operations about thirty years ago, including a notable success reported in this *Journal* by Scutlar,¹ little progress was made until 1950, when Baker, Brock, and Campbell² published an account of six successful operations, the first series in this country. A little earlier Bailey, Glover, and O'Neill,³ of Philadelphia, had reported eleven successes. By May, 1952, Baker, Brock, Campbell, and Wood⁴ were able to describe a series of 100 operations: 13 of the patients had died, but 7 of these were in the first 20 to be operated on. Of 50 patients followed for at least eight months, 32 had a good or an excellent result. In the opening pages of this issue Mr. T. Holmes Sellors and Drs. D. Evan Bedford and W. Somerville describe the clinical and surgical features of 150 cases of mitral stenosis treated by operation, with only four operative deaths. Four other patients died subsequently. Of 110 patients followed for more than three months, 81 have had a good result and 9 others have had worth-while relief of disability.

At present all that the surgeon does at operation is to enlarge the narrowed mitral orifice. If he can do this so as to re-create mobile valve flaps, allowing an increased flow without reflux, a good result will follow. The stenosis is largely due to organization of repeated fibrin deposits, especially between the cusps, where commissures are formed.⁵ The operation consists in division of these commissures, and this can usually be accomplished by digital pressure. The type of valve ideal for surgery is the diaphragmatic, for reasons clearly shown by Holmes Sellors and his colleagues. More severe stenosis is accompanied by greater thickening of the valve leaflets and by shortening of the chordae tendineae: valvotomy is the more difficult, a knife must often be used, and normal function cannot be restored. The rigid

fibrous funnel of the grossly damaged valve is not suitable for operation, nor, at the present state of knowledge, is the irregular gaping orifice of the incompetent valve.

In selecting patients for operation the surgeon has also to consider the state of the other valves, of the pulmonary vessels, and of the myocardium, though the importance of myocardial damage has perhaps been exaggerated in the past. A patient suitable for surgery must be suffering from symptoms disabling enough to warrant the risk, and these must be due predominantly to mitral obstruction. Breathlessness on exertion is usually the first symptom. Haemoptysis is common, and it is sometimes sudden and massive (pulmonary apoplexy). More serious symptoms are orthopnoea and paroxysmal pulmonary oedema. Attacks of pulmonary oedema usually occur in patients with regular rhythm and a small heart and are a strong indication for operative treatment.

The physical signs associated with a diaphragmatic valve are a tapping apex beat with a snapping first sound and an opening snap—a sharp click following the second sound. Typically there is a loud rumbling diastolic and presystolic murmur, but this may be faint or even absent. The pulse is small. The heart may be enlarged, and in general the larger the heart the more serious the outlook. With mitral stenosis the right ventricle enlarges, displacing the apex beat to the left. Enlargement of the left ventricle, unless the aortic valve is diseased or there is hypertension, is due to mitral regurgitation and is a contraindication to operation. A great enlargement of the left atrium and systolic expansion seen fluoroscopically, especially in the antero-posterior position, also imply severe regurgitation; a systolic murmur is less important. Many stenosed mitral valves which are suitable for operation allow some regurgitation, which should not then prevent operation. Calcification of the valve suggests advanced disease, but may be present in some cases suitable for valvotomy: though an unfavourable feature, it is not a contraindication.

Attacks of congestive heart failure may indicate myocardial damage or a lesion outside the mitral valve; but if the signs suggest a pliant stenosis and if the failure is not of long duration and can be controlled by medical treatment operation should not be withheld. The presence or absence of auricular fibrillation does not influence the decision for or against surgery, except that it is more common in advanced disease. A history of previous embolism is usually considered an indication for operation because patients who have had one embolus nearly always have others and usually die from this cause

within a few years. An additional risk will be run, since thrombus in the left atrium may be disturbed by the surgeon's manipulations and an operative embolus result. This, however, is not an inevitable complication in such cases. Associated disease of other valves is not a contraindication to operative treatment provided that the disability is principally due to mitral obstruction. Disabling symptoms arising during pregnancy need no longer be considered an indication for termination, since several successful valvotomies have been performed on pregnant women with subsequent normal delivery at term.

When operative treatment has been decided on the patient should be made as fit as possible; preliminary in-patient treatment with digitalis and diuretics may be needed. The method of anaesthesia in these cases requires no special comment, but an intravenous drip of saline with procaine is usually given in the hopes of reducing the likelihood of ventricular fibrillation during operation. A blood transfusion must be ready, but there is usually surprisingly little loss of blood. Most surgeons prefer a lateral or postero-lateral approach through the fifth intercostal space or rib bed. The pericardium is opened and the valve approached by inserting a finger through the left auricular appendage after amputating its tip beyond a clamp. The appendage fits the finger snugly so there is no haemorrhage. Many unsuccessful attempts have been made to devise a method of operation which allows a satisfactory view of the valve, but much can be learnt by palpation. As a rule the commissures can be split by digital pressure: the different patterns of knife available for use when pressure fails suggests that the perfect mitral valvotome has not yet been invented.

The most distressing operative complication is embolism, with an incidence of about 5%. It may occur when no thrombus has been palpated or suspected, and may be due to calcified fragments as well as to clot. The most common site is the brain, and death or permanent hemiplegia may result. Some surgeons believe that compression of the carotid arteries does something to reduce the incidence of this complication. Embolus may also occur in the aorta, and occasionally an aortic embolectomy has been carried out a few hours after a valvotomy. But these complications are the exception, and in most patients recovery is straightforward and improvement immediate and lasting. As yet there is no evidence that recurrence due to re-formation of the commissures takes place. Many patients, completely disabled by distressing dyspnoea, have returned to a normal life and to work. The results obtained by Brock, Holmes Sellors, and other thoracic surgeons

are so promising that operation should be considered for every patient who is severely disabled by mitral disease. The decision whether or not to operate can be made accurately on clinical grounds assisted by routine investigations alone. Provided that mitral obstruction is responsible for the symptoms, a good result can be expected.

H. INFLUENZAE AND ANTIBIOTICS

H. influenzae is perhaps more uniformly susceptible to all the major antibiotics than any other species of micro-organism. In the treatment of the most serious infection caused by it—meningitis in infants—we have witnessed the successive trial of penicillin, streptomycin (with or without sulphadiazine and immune serum), and the newer antibiotics—of which chloramphenicol is the most effective, not only because of its high degree of antibacterial activity but because it reaches the cerebrospinal fluid in higher concentrations than any other of these drugs. Nevertheless there are some minor discrepancies in reports of the sensitivity of this organism to different antibiotics, and some findings were based on the study of only a few strains. A comprehensive study of this kind, embracing 34 serologically identified capsulated strains and 50 non-capsulated, is reported by Dr. K. Zinnemann on page 1069. The "punch" or "cup" plate method was used for these tests, and this is apt to give results somewhat unflattering to the drug tested, since its concentration anywhere in the medium surrounding the cup is inevitably less than that of the solution introduced, and diminishes steeply with distance from the margin. More clear-cut results, with lower minimum inhibitory concentrations, are obtainable by mixing the antibiotic uniformly with the medium: by such a method Finland and Wilcox¹ found all their strains of *H. influenzae* to be inhibited by 0.6–1.0 µg. per ml. of chloramphenicol, whereas some of Zinnemann's required concentrations five times greater. A similar difference is observed with aureomycin, most of Finland and Wilcox's strains being inhibited by from 0.6–2 and all by 4 µg. per ml., while some of Zinnemann's were not inhibited by any concentration tested. Whatever the method used, as Zinnemann points out, the relative activity of different drugs can be satisfactorily assessed, and the order of merit based on these tests is chloramphenicol (most active), terramycin, streptomycin, aureomycin. Penicillin ranks with the most active so far as its perform-

¹ *British Medical Journal*, 1925, 2, 603.² *Ibid.* 1950, 1, 1283.³ *J. thorac. Surg.*, 1950, 19, 16.⁴ *British Medical Journal*, 1952, 1, 1043.⁵ Magarey, F. R., *British Medical Journal*, 1951, 1, 856.¹ *Amer. J. clin. Path.*, 1950, 20, 735.² *J. Amer. med. Ass.*, 1952, 149, 231.³ Lewis, C. N., et al., *Antibiot. and Chemother.*, 1952, 2, 601.⁴ *Acta med. scand.*, 1952, 143, 32.

ance *in vitro* is concerned, but is regarded as therapeutically less useful because the corresponding concentrations are not obtained *in vivo*, at least by any ordinary dosage.

These results may be compared with those given by Dr. A. White Franklin and Professor L. P. Garrod (p. 1067) for strains of *H. influenzae* all derived from the sputum of children with bronchiectasis. Their results were obtained by incorporating the antibiotic in the medium, and there is no significant difference in activity between chloramphenicol, aureomycin, and terramycin, a concentration of 1 µg. per ml. of each of these three antibiotics sufficing to inhibit the growth of all strains (it should be remembered in this connexion that in Zinnemann's tests non-capsulated strains from sources such as this were on the whole more sensitive than capsulated). The variation in sensitivity to penicillin and streptomycin is wider, but the majority were inhibited by 1 and 4 µg. per ml. respectively of these antibiotics. The paper reporting these findings is an account of the results of treating bronchiectasis in children with chloramphenicol. The effect of giving adequate doses was always to suppress the infection, even in severe cases: the sputum became scanty and *H. influenzae* disappeared from it. In some mild cases benefit persisted after treatment was stopped, but in most it continued only during administration of the drug, although a diminished dose sufficed. Treatment for one day in each week was found to be inadequate. This study was brought to an abrupt termination by the death of one of the patients from aplastic anaemia, and it is mentioned that an adult in the same hospital treated with chloramphenicol for *H. influenzae* bronchitis developed the same complication, although he survived it. It may be remembered in this connexion that 2 out of 62 patients treated by Wilson and his colleagues² for bronchiectasis with 1 g. of chloramphenicol twice weekly for 5½ and 7 months developed aplastic anaemia, fatal in one of them. He would be a bold man who chose to conclude that the authors of each of these papers had merely been very unfortunate in having seen two cases each of this complication in a comparatively small series of patients. It would be safer to conclude either that the risk is greater from prolonged treatment, although an American survey³ is said to have elicited no evidence of this, or that some extra risk is involved in the treatment of this particular disease.

If it be agreed that the use of chloramphenicol in the treatment of chronic bronchial infection is unjustified, a powerful therapeutic weapon is lost to us. The high concentrations of this drug in the bronchial secretion, as demonstrated by Franklin and Garrod,

may well account for its apparent superiority to other antibiotics. Similar trials of aureomycin and terramycin should evidently be carried out. According to Mulder and his colleagues,⁴ who describe an extensive study of chronic *H. influenzae* bronchitis (it is not clear whether some of their 125 adult patients also had bronchiectasis), these two drugs suppressed the infection at least temporarily in most of the small number of patients so treated. The authors obtained their best results by giving both penicillin and streptomycin in daily doses of 4 million units and 2 g. respectively: this treatment eliminated the infection in 50 out of 66 patients, but is presumably feasible only in in-patients.

It has often been truthfully said that the great advances in chemotherapy have done much less so far for sufferers from chronic infections than for those whose lives are in immediate danger. There is scope for further study in this difficult field, and it should not too hastily be concluded that any benefit achieved can only be temporary, especially in the young.

MODIFIED LEUCOTOMY

Operations on the brain, intended by means of a circumscribed lesion to influence some of the symptoms of illness, have now been developed in considerable number. Surgeons have developed techniques of undercutting the cortex or severing the central white matter in different regions of the frontal lobes, of operating directly on the thalamus and aspirating the cingulate gyrus. All these are very different from the so-called standard leucotomy operation which was the prevailing practice ten, and even five, years ago. In a recent issue of the *Journal*¹ Dr. William Sargant described from a wide and varied experience the indications for a modified leucotomy operation. The particular modification of leucotomy to which he directed attention is that in which an attempt is made to confine the injury to the medial inferior quadrant of the frontal lobe, anterior to the tip of the lateral ventricle, so as to divide only this portion of the thalamo-frontal radiation. Those who have had experience of this operation, which has been developed particularly by Mr. Harvey Jackson and Mr. Wylie McKissock, are satisfied that the amount of undesirable personality change produced by it is very much less than that caused by the old standard operation, while its beneficial effects are probably at least as good.

Prefrontal leucotomy is essentially a symptomatic method of treatment, and does nothing for the cure of any disease which may underlie the symptoms for whose relief it is given. Therefore it can be and has been applied in a great variety of conditions. The patients most often selected for operation are schizophrenics; but the reason for this is not that these

patients are especially suitable—often they are not—but that their state is often so severe, so chronic and otherwise intractable, that any measure, even a damaging operation on the intact brain, seems justifiable if it can promise fair chances of some relief. The symptoms which can be relieved by leucotomy are pre-eminently those of mental distress—states of tension, anxiety, depression, hypochondriacal preoccupation. The operation is therefore of value in relieving intractable pain, as from carcinoma; the relief most commonly seen is that the patient continues to experience pain but is no longer so distressed by it and can apply himself to occupations and distractions. A small proportion of patients who suffer from tinnitus find the noises in the ears unendurable, and are prevented from sleeping, relaxing, or taking the slightest pleasure in any usual interest. They, too, usually benefit from leucotomy, if the gravity of their state is held to warrant it.

However, as Sargant has pointed out, the bulk of the patients for whom leucotomy comes to be considered are those who suffer from psychiatric disorders. In the past these have properly been exclusively patients suffering from psychoses. With the advent of a modified operation which, so far as present experience goes, seems to leave the personality so largely intact, permits a normal social life, and has very little if any ill effect on religious life and ethical attitudes, the time has come when it is right to consider also those patients whose condition is essentially neurotic in nature. Certainly all other reasonable methods of treatment must have received an adequate trial, and the condition must be not only intractable but having a very damaging effect on the life and happiness of the patient. If this is the case, then chronic anxiety states, chronic hypochondriases with marked symptoms of depression or tension, and chronic depressive reactions may all arise for surgical consideration. It is in only a small proportion of cases of these kinds that the indications will be thought to be adequate; but surgery does hold out hope to some of the worst cases at a price which now seems more reasonable than of old.

As has recently been brought out by Kolb² in a review of the results in about 10,000 cases in the United States, one of the prerequisites for successful surgical treatment of severe psychiatric illnesses is the possibility of adequate aftercare. The attitude of the relatives is of supreme importance. If they are prepared to give the patient a new chance, to make allowance for his remaining deficiencies, and to take some personal responsibility in his rehabilitation, then the chances of a good result are much improved. Operative treatment is only one part, even if it is the most significant one, in the whole plan of treatment in those cases in which it is applied. The doctor must be prepared to maintain his interest in his patients after operation, to continue to help them on their way, as Sargant has emphasized, by all the psychotherapeutic and somatic methods they may require, even after the six to twelve months it takes for operation to show its full effects. The principle of therapeutic persistence is one which, here as elsewhere, brings untold benefit.

PLANTAR WARTS

The literature on the infective wart is peculiarly barren. There are few people on whom the impudent visitor fails to call at some time in life, yet our knowledge of the natural history of the disease, our understanding of its aetiology, and the approach to treatment leave much to be desired. It might be thought that a lesion so common and so accessible, associated as it appears to be with the presence of a virus, and producing a wide variety of intriguing pathological patterns of a neoplastic character might provide an important field of research for the experimental pathologist and the virologist. Yet little is written that could not be contributed by the lay wart charmer. It is doubtful if the legitimate practitioner, even when he enlists the services of his psychiatric colleague, approaches the therapeutic success of this unqualified competitor.

The age incidence of warts, the great modification of them produced by the different textures and other characters of the skin affected, and the variable course of the disease in different individuals, variations which may run parallel with changes in the physical and emotional health of the patient, point to the importance of the soil as well as the seed in this disease. Perhaps the discovery of an effective viricide would simplify treatment and make considerations of soil irrelevant, but that day is not in sight. At present the assessment of most methods of treatment is vitiated by ignorance of the psychological factor, which can so modify the skin as to render it unreceptive to the infective wart.

Plantar warts behave in the same manner as warts at other sites, but call for general consideration. The thickness of horn and the trauma of walking drive the warty growth in towards the dermis instead of allowing it to develop outwards. This outward growth in fact occurs if the patient avoids walking and is rested in bed. The pressure on the dermal papillae, by causing pain, may lead to orthopaedic faults, and for this reason plantar warts demand treatment.

Whitfield¹ recognized two patterns of plantar wart. The first was dependent on trauma resulting from deformity of the foot or from an irregularity in the sole of the boot, and its cure rested upon correction of this fault. The other type of the simple infective variety was often multiple and particularly affected the site of tread. That moisture favours the growth and exuberance of warts seems evident, and many forms of treatment clearly benefit by their desiccating effect. Branson and Rhea,² from their experience of treating forty-eight soldiers with plantar warts in the American Army, claim success from the injection of 1% procaine into the stratum germinativum exactly under the wart. That last injunction perhaps only emphasizes that once again we are reading the results of treatment by suggestion. The procedure must be a very painful one.

There are two lines of treatment for infective warts, no matter what their site. Plantar warts must undergo radical removal or destruction. This is most satisfac-

¹ *Brit. J. Derm.*, 1932, 44, 580.

² *New Engl. J. Med.*, 1953, 248, 631.

³ Morgan, J. K., *Brit. J. Derm.*, 1952, 64, 55.

⁴ *Ibid.*, 1943, 55, 267.

¹ *British Medical Journal*, 1953, 2, 800.

² Kolb, L. C., *J. Amer. med. Ass.*, 1953, 152, 1085.

torily achieved by curettage under anaesthetic or after freezing by carbon-dioxide snow or liquid nitrogen,³ less satisfactorily by diathermy or a destructive dose of x rays. There has quite rightly been much outcry against the use of x rays, and undoubtedly it is improper to produce radiotherapeutic damage of the foot in the treatment of so benign a lesion as a wart. Even so, if properly conducted, the treatment may be both successful and safe.

Other forms of treatment depend essentially on suggestion, though some combine with it some degree of destruction or desiccation. Perhaps the most useful is Thomson's treatment with 3% formalin.⁴ The wart or warts are placed in contact with the solution in an egg-cup for ten minutes each day for six weeks. Less certain measures are adhesive strapping with or without 25% podophyllin in oil and fractional doses of x rays. Astringent foot baths and powders are of some prophylactic value, especially where there is hyperhidrosis.

SUNLIGHT AND MILK

Milk is often exposed to sunlight for long periods. It may be exposed in the van during delivery and later on the doorstep, particularly at week-ends, when the milk bottle left at the side door is a common sight. This exposure to light affects not only the vitamin content of the milk but also its flavour. Considerable quantities of the riboflavin of milk are inactivated by exposure to ultra-violet light, and as much as 50% of the ascorbic acid may be destroyed if milk is left in bottles exposed to bright sunlight for an hour or so.¹ The change in flavour of milk exposed to light seems to be associated with the presence of sulphur-containing compounds.

According to Patton and Josephson² the objectionable flavour is due to the presence of a compound produced by the photochemical decomposition of the sulphur amino-acid methionine, the reaction being accelerated by riboflavin. These workers suspected the importance of methionine in this connexion when they observed that dilute solutions of methionine itself exposed to sunlight developed a flavour identical with that produced in milk treated in the same way. Further examination of the problem showed that the addition of methionine in amounts as small as 4 mg. per quart (1.1 l.) intensified the flavour in skim-milk exposed to sunlight. The process is undoubtedly photochemical, for it depends on the time of exposure and the wavelength of the light, and is independent of temperature. The readiness with which the flavour developed in skim-milk in comparison with solutions of methionine alone suggested that one of the constituents of milk activated the process. It was suspected that this might be riboflavin, which absorbs light and is a component of an oxidation-reduction enzyme system. Patton and Josephson observed that exposure of a solution containing methionine and riboflavin to light developed the flavour to a much greater degree than one con-

taining methionine alone; riboflavin solution alone developed no flavour. Other sulphur-containing amino-acids, such as cysteine and cystine, were tested, but were not found to be associated with the production of the "light" flavour, which seems to result specifically from the photolysis of methionine in the presence of riboflavin.

Whatever the mechanism of the process, milk should be exposed to sunlight as little as possible if its flavour and vitamins are to be preserved. The use of milk bottles made of dark glass would minimize the effect of light on the milk, and as the breakage rate of bottles is very high the gradual replacement of existing stocks would not take very long.

ELECTRONIC EYES?

Someone recently asked St. Dunstan's whether television could somehow be adapted to help the blind to see. This is a recurring theme with each new invention. When the full story of science's part in the war was published radar was proposed as a substitute for sight, and an article in this *Journal*¹ explained why centimetric radio waves were unsuitable for any form of blind aid, and described some research done at St. Dunstan's and elsewhere on ultrasonic aids which were more promising. It was then pointed out that all instrumental aids faced some general difficulties. They had to be very small and light or no one would wear them for long. They had to be simple to control and maintain. All of them took time to learn to handle, and it was found that where a blind person was prepared to spend the necessary effort on a course of instruction—and, since the majority of the blind are elderly, this is not always the case—the end-results were less good than if the same effort had been expended in developing the other senses. In other words the blind man does better by improving his use of his own body than by calling in any of the tools science can offer.

But can science offer electronic eyes? Dr. E. D. Adrian² has explained in a recent issue of the *St. Dunstan's Review* why this is at present impossible. Sensation of light or movement of a crude kind can be produced by stimulating the surface of the cerebrum directly, but to leave electrodes in contact with the brain surface for more than a short time is risky, while contacts on the scalp outside the skull are obviously too distant for precise localized stimulation. Furthermore, "the visual messages from the eyes do not go straight to the cerebral cortex and to nowhere else; they go through an elaborate nervous apparatus in the retina and in the brain stem, so that what arrives in the cerebral cortex is not just a reproduction of the pattern of light and shade falling on the retina." We do not at present know enough about the retinal events and their relation to the conscious events which constitute vision, but even if we did the pattern of electrical microstimulation required might well prove impossible to produce. Research in other directions will be more profitable.

¹ Holmes, A. D., and Jones, C. P., *J. Nutr.*, 1945, 29, 201.
² Patton, S., and Josephson, D. V., *Science*, 1953, 118, 211.

¹ Beule, R. L., *British Medical Journal*, 1951, 1, 1319.
² *St. Dunstan's Review*, 1953, 30, 8.

CLINICAL PATHOLOGY IN GENERAL PRACTICE TAKING SWABS

BY

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Use of the cotton-wool swab mounted on a wire or wooden applicator for the collection of material for bacteriological examination from various body surfaces and cavities is some 60 years old. Recommended by Councilman in 1893, it was first used in Britain by Hewlett and Nolan (1896) and by Preston (1896) for the isolation of diphtheria bacilli from the throat of affected patients. It has since been widely utilized for the collection of secretions or discharges from the nose, nasopharynx, larynx, trachea, eye, ear, skin, superficial and deep wounds, rectum, vagina, and cervix. The purpose of this article is to discuss the kind of swabs to be used and the best method of collecting material from the sites mentioned.

The Swab

The swab commonly consists of a small pledget of cotton-wool wrapped tightly and smoothly round the roughened end of a wire or wooden applicator in such a

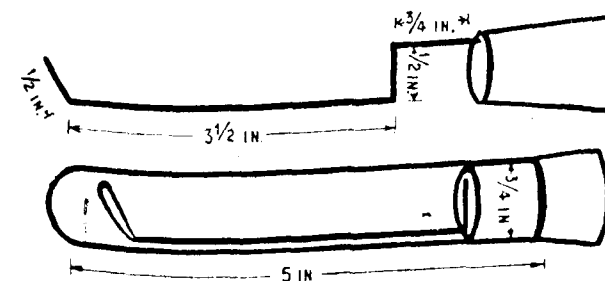


Fig. 1.—Nasopharyngeal swab for use through the mouth.

way that no part of the end of the applicator is left exposed and there is little risk of the swab being pulled off during the collection of the specimen. This latter requirement is particularly important for nasal, cervical, and rectal swabs. The swab should not be bulky, and for per-rectal use should be small enough to avoid unnecessary irritation to the nasal mucosa when being passed back to the nasopharynx. Although the use of absorbent cotton-wool is usually recommended, it is probably more advantageous for the survival of bacteria on plain swabs to use non-absorbent wool (Rubbo and Benjamin, 1951). As regards the applicator, wire is more flexible than wood, but the metal should not be too pliable, as aluminium tends to be: "nichrome" wire is now widely used, but stainless-steel wire, which can be hooked at the end to retain the swab, is also favoured. The wooden applicator is recommended for use with the serum swab (see below) to avoid the discoloration which may result from the interaction of the serum with a metal, although this

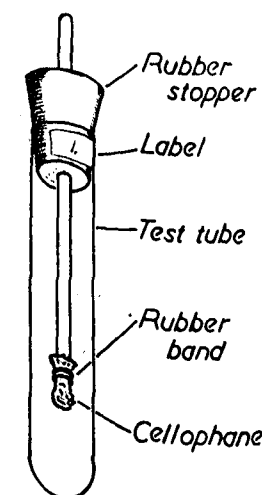


Fig. 2.—Perianal swab for threadworm ova.

risk should not occur with stainless-steel wire. The applicator is usually pushed into or through a cork at the holder end, and the whole swab is assembled in a test-tube container.

Swabs of special design are used for the collection of material from particular sites. West's swab in a bent glass tube for swabbing the nasopharynx is now an anachronism: instead the ordinary throat swab with a flexible wire holder may be bent to an obtuse angle (about 120 degrees) $\frac{1}{2}$ in. (1.3 cm.) from the tip and used with a tongue depressor to avoid mouth contamination. The swab described by Tarr (1946) for post-nasal culture is illustrated in Fig. 1. For pernasal swabs fine nichrome (s.w.g. 25) or stainless-steel wire with a hooked end is recommended (Cockburn and Holt, 1948). In collecting material from the conjunctiva some ophthalmologists prefer to use the wire loop, which is inoculated directly on to the culture medium, but a fine cotton-wool swab may be used instead. For laryngeal swabs the choice lies between nichrome wire (s.w.g. 16) and stainless steel, which is rather more rigid: the applicator is 9 in. (23 cm.) long and bent at an angle of 120 degrees about 2 in. (5 cm.) from the tip, and is placed in a large test-tube container (8 by 1 in.—20 by 2.5 cm.).

For obtaining faecal material with a swab passed into the rectum and for swabbing the vagina or cervix, the ordinary throat swab with a 6 in. (15 cm.) long applicator is best. A special type of perianal swab is used for collection of roundworm ova. It consists of a 2 cm. square of plain transparent non-moisture-proof "cellophane" wrapped about the tip of a small glass rod and held in place with a rubber band. The holder end of the rod is pushed through a cork stopper and the whole swab placed in a test-tube container (Fig. 2).

The Serum Swab and Bacterial Survival

A major concern in the use of the cotton-wool swab is the period of viability of pathogenic bacteria on the swab between collection of the material and its inoculation on to appropriate culture media. Because of the poor viability of certain bacteria like the gonococcus and the meningococcus material suspected of containing these pathogens is best inoculated on to suitable media as soon as the swab is taken; but this procedure has obvious disadvantages, and various substitute methods for allowing an interval of time between collection and inoculation of these poorly viable bacteria have been recommended. For example, Stuart (1946) found that gonococci could survive for 24 hours or longer if the swab on a wooden applicator is immersed in Brewer's medium before transportation to the laboratory: a somewhat similar procedure was recommended by Saint-Martin (1949), who used Hirschberg's medium as the vehicle. Downie (1940) found that meningococci on nasopharyngeal swabs could be cultured 24 hours after swabbing if the swab were immediately placed in contact with blood agar in the bottom of the container, while Aycock and Mueller (1950) recommended immersion of the swab in horse blood for the same purpose.

The problem of bacterial survival is not confined to the *Neisseria*, since slow-drying is known to be lethal to most bacterial species. The matter has been extensively investigated by Rubbo and Benjamin (1951), who, as a result of their comparative findings with many different pathogens, recommend the use of a serum-coated cotton-wool swab. The swabs are prepared by dipping the cotton-wool swab on a wooden applicator into undiluted ox serum for 10-30

seconds, spreading them out on sheets of blotting paper, drying in an incubator at 37° C. for about half an hour, and finally sterilizing in the autoclave at 15 lb. per sq. in. (1 kg. per cm.²) for 20 minutes. The finished product is a compact honey-coloured pledget, 3-5 mm. in diameter, in which the cotton-wool fibres are firmly bound to each other and to the applicator.

Rubbo and Benjamin found that, with the exception of the *Neisseria*, the serum swabs prolonged survival and gave heavier growths (compared with plain swabs) of some 16 different bacterial pathogens. In addition, they showed that moistened plain swabs but not serum swabs accelerated the death rate of Gram-positive bacteria like *Str. pyogenes* and *C. diphtheriae*, whereas the survival of the Gram-negative intestinal pathogens like the typhoid bacillus and Flexner and Sonne dysentery bacilli was prolonged in the absence of moisture. The deleterious effect of moisture and slow drying on the viability of *Str. pyogenes* and *C. diphtheriae* has a direct application to the moist throat swab, which with plain cotton-wool is unlikely to give reliable results if there is a delay of twenty-four hours between collection and inoculation. For example, in an outbreak of scarlet fever 170 miles from Melbourne the Australian workers found that plain and serum swabs cultured on blood agar twenty-four hours after collection gave respectively 23% and 39% positive isolations of *Str. pyogenes*. Variations in atmospheric temperature (15-24° C.) were unimportant, but

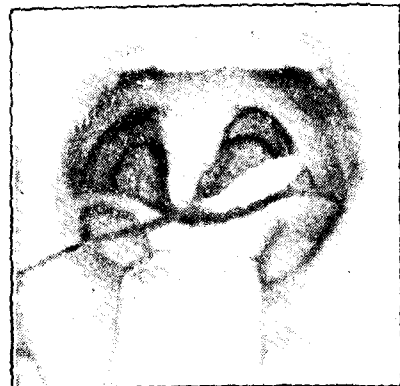


FIG. 3.—Throat swab with a clear view of the fauces.

better in discharges collected on linen rather than on cotton-wool (see Mackie and McCartney, 1953). If, then, the serum swab is used, and assuming a moderately heavy coating with the suspected pathogen, bacteriological examination of such material usually yields a valid result when cultured within the following time limits:—(1) organisms viable for less than eight hours: gonococci and meningococci (see alternative methods listed above); (2) organisms viable for eight hours: *H. pertussis*, *C. diphtheriae*, *V. cholerae* (moist swab); (3) organisms viable for twenty-four hours: haemolytic streptococci, pneumococci, *Str. viridans*, and *Cl. welchii*; shigellae and salmonellae on moistened swabs; and (4) organisms viable for forty-eight hours: staphylococci, coliform bacilli, proteus, and pyocyanus.

Throat Swabs

The throat swab is used principally to collect material from the faucial area in patients suffering from acute pharyngitis or tonsillitis or suspected Vincent's angina, and in the detection of contact, convalescent, or chronic carriers of haemolytic streptococci or *C. diphtheriae*. The operator must have a clear view of the whole fauces in a good light and see the swab touching the affected surfaces (Fig. 3). The patient should be sitting up or standing with the head tilted back; with children or nervous patients an assistant should support the back of the head with one hand, to prevent sudden or unexpected movement, and hold the patient's hands with the other. If good natural lighting cannot be obtained a hand torch must be used; some tongue depressors

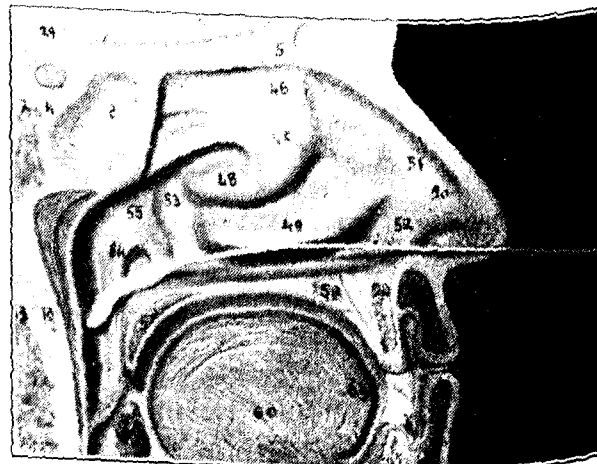


FIG. 4.—Nasopharyngeal swab passed through the nose.

have an illuminated tip which does equally well. It is wise to use a tongue depressor even with patients whose throats can be clearly seen. It should be placed in one movement firmly on the back of the tongue, after which the swab is inserted and rubbed over the faucial area, gently if the throat is acutely inflamed, more vigorously if searching for carriers. In suspected chronic tonsillar carriers or infections the swabbing may be preceded by pressure with the fingers on the tonsils to squeeze out secretion in the tonsillar crypts. When Vincent's angina or monilia is suspected two swabs should be taken, as one will be required for the preparation of smears for direct microscopical examination, which, however, has little or no value in other acute throat infections. Throat swabs are preferred to throat washings for the isolation of poliomyelitis virus from the oropharynx.

Nasopharyngeal Swabs

Some pathogenic or potentially pathogenic bacteria that colonize the upper respiratory tract are to be found predominantly in the nasopharynx or post-nasal space. These include the meningococcus and pneumococcus, and in whooping cough *H. pertussis* is most conveniently isolated by nasopharyngeal swabbing. This area may be reached with a swab passed through either the mouth or the nose. The peroral swab with its bent tip is passed to the back of the throat—a tongue depressor is essential—and then slipped up behind the uvula to the post-nasal space. In infants it may be very difficult to pass the swab up behind the uvula, and instead the tip may be directed downwards to the posterior pharyngeal wall. The pernasal swab is passed more or less horizontally along the floor of the nasal passage (Fig. 4), with the patient's head held firmly because of the natural

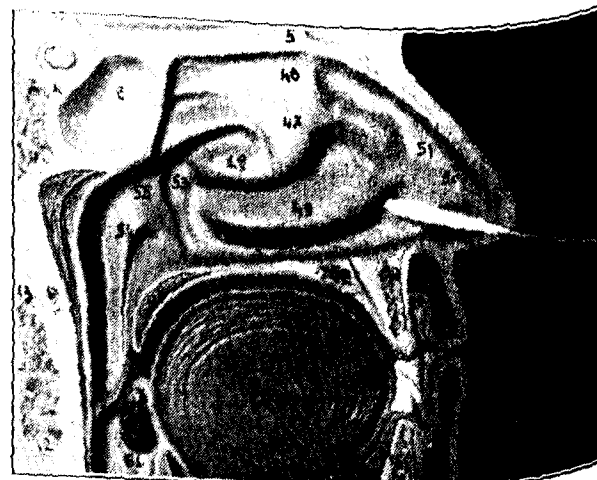


FIG. 5.—Swabbing anterior nares for staphylococcal carriers.

tendency to withdraw. If contamination with bacteria in the anterior nares is to be avoided, a nasal speculum should be used.

Nasal Swabs

Swabs may be taken from two different sites in the nasal cavity as well as from the post-nasal space. A high proportion of the population carry *Staph. aureus* in the nose, and this organism is found particularly in the vestibule or entrance to the nostrils, where it multiplies on the moist invaginated squamous epithelium. In searching for staphylococcal nasal carriers, therefore, it is sufficient to rub a moistened swab round the vestibule of both nostrils (Fig. 5). If, on the other hand, material is to be examined for infection of the nasal mucosa or associated paranasal sinuses, the swab should be rubbed over the turbinates. Similarly in searching for nasal carriers of pathogens like *Str. pyogenes* or *C. diphtheriae* and in obtaining swabs from young children with suspected pneumococcal respiratory infection the swab should be inserted ½-1 in. (1 to 2.5 cm.) into the nasal cavity, again using a speculum if contaminants from the vestibule are to be avoided.

Laryngeal Swabs

The laryngeal swab has only recently come into frequent use for obtaining lung secretions in early suspected cases of pulmonary tuberculosis or in convalescing patients who have become sputum-free. With a little experience, at first using a laryngeal mirror, the doctor will find that for this purpose the laryngeal swab has advantages over stomach washings, in that the patient is more willing to co-operate in having repeat swabs taken. The bacteriologist also prefers it because it is easier to handle. It is, however, essential that the swabs should reach the laboratory within a few hours of being taken.

The patient, sitting up and with his head tilted back, is asked to open his mouth widely. The operator, who should wear a mask, catches the tongue in a gauze swab and pulls it forward so that the patient tends to "gag." The laryngeal swab is dipped in sterile water or saline and then with or without the aid of a mirror is passed down into the larynx, when the patient may be asked to cough but usually does so without being asked. Two successive swabs should be taken, placed in the test-tube container, and transported by messenger to the laboratory as quickly as possible.

Eye Swabs

Swabs may be taken from the conjunctival mucosa when it is inflamed or as a preliminary to operations on the eye to exclude the carriage of pathogenic bacteria. The patient is asked to look up. The lower lid is everted and a fine swab is rubbed gently along the conjunctival surface.

Ear Swabs

Infection of the ear may occur in the external meatus or in the middle ear. In otitis externa a fine swab is rubbed gently over the inflamed area. In suppurative otitis media accumulated discharge must first be cleaned away before the swab is taken, preferably through an aural speculum, so that if possible the bead of pus oozing through the perforated membrane is collected.

Skin Swabs

Swabs may be taken from the intact skin in searching for carriers of pathogenic staphylococci among food-handlers in an outbreak of staphylococcal food-poisoning or among hospital staff and patients in outbreaks of staphylococcal infection—for example, wound infection, pemphigus neonatorum, or lactation mastitis. Moistened swabs should be rubbed over the skin of the fingers, back and front, or an area of about 1 sq. in. (6.5 cm.²) on the back of the wrist may be swabbed.

Rectal Swabs

Swabs may be taken from the rectum for the bacteriological diagnosis of infantile gastro-enteritis, bacillary

dysentery, or enteric fever, but in spite of the advantages of the rectal swab in convenience and hygiene of collection it does not allow the full examination for parasites, etc., that is possible with a specimen of faeces. The rectal swab has been used particularly in swabbing groups of young children in day or residential nurseries during outbreaks of Sonne dysentery to find out quickly the incidence of cases and carriers in the group. Whenever it is used, it is important to ensure that, with the patient lying on his side, the swab is pushed well into the rectum and that it is covered with faecal material when withdrawn. The swab must be cultured within a few hours of collection unless some method for keeping it moist is adopted. It is most convenient for collecting specimens from young children; in children over the age of 3 years the doctor should for psychological reasons explain to the patient what he intends to do. It is unnecessary to use a speculum in collecting specimens from children under 5 years of age, but a specially made glass or rubber speculum may be used in older children and adults.

Perianal Swabs

In suspected cases of threadworm infestation a special swab (see p. 1095) may be used to collect scrapings from the anal region, where the ova are frequently found. The edge of the cellophane swab is scraped through the perianal folds and the swab is then transported in the test-tube container to the laboratory, where the cellophane is removed and the swab placed faeces side down in a drop of N/10 sodium hydroxide.

Vaginal or Cervical Swabs

Vaginal discharge may be derived from inflammation of the vagina itself as in trichomonal infection and the vulvovaginitis of children, or from the cervix or uterus as in gonococcal and puerperal infections. For the bacteriological examination of most of these infections in adult women the practitioner will find it most practicable to take a high vaginal swab with the patient lying on her side. The external labia and perineum should first be cleansed with warm water, swabbing towards the rectum in one movement. A Cusco bivalve speculum or a Sim duckbill speculum is introduced and an ordinary throat swab is passed into the posterior vaginal fornix. A cervical swab can be taken satisfactorily only with the patient in the lithotomy position, when with a Cusco speculum the cervix is exposed and the swab introduced. In cases of suspected trichomonal infection some of the discharge should be collected with a Pasteur pipette, which is then sealed with plasticine so that the fresh specimen can be examined as a wet film under the microscope. But a swab may be used, provided enough of the discharge can be collected to allow preparation of the wet film.

For the vulvovaginitis of childhood the patient should be lying in the dorsal position with the knees drawn up and the thighs separated as far as is possible without hurting the child. Any superficial discharge is removed and the external genitalia are separated with gloved thumb and first finger of the left hand. The swab must be pushed well into the vagina and withdrawn with some discharge on it. The first swab is used to prepare a smear and the second for inoculation on suitable culture media as soon as possible.

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Next article on Clinical Pathology.—"The Collection of Forensic Specimens," by Dr. Donald Teare.

Nova et Vetera

THE STUDY OF MEDICINE AT THE
UNIVERSITY OF COPENHAGEN,
1537-1645

Dr. E. Gotfredsen has recently reviewed¹ the medical history of the University of Copenhagen with a happy blend of nostalgic piety and gentle irony. The year 1537 is noteworthy for the re-establishment of the University of Copenhagen by King Christian III after the storms of the Reformation had subsided. Two years later the King undertook to uphold the spirit of the restored university with "good professors" honourably paid. The payment was 140 daler yearly—a rate of pay which Professor Erik Warburg has lately found to be equivalent to that enjoyed by "good professors" at the present time when due allowance is made for the cost of living then and now. A professor of theology received 10 daler more a year, but a professor of law had to be satisfied with only 100 daler yearly, and the stipend of a professor of philosophy was down to 70 daler. But, if numbers count, the faculty of philosophy was better represented with its eight professors than the faculty of medicine with its modest two. Professors of medicine had not only to teach but also to attend the sick at Court and at the university as well as the nobility in the provinces.

The range of subjects which the professors of medicine had to teach the young was quite impressive. Lectures were given on mathematics and astronomy, and enough had to be known of the latter to enable a professor of medicine to edit an almanac every other year. Astrology was also included in the syllabus in so far as it had to be invoked in the drafting of a horoscope, but professors were warned to walk gingerly in this particular field, "as Christians should avoid all superstition." The subjects to be lectured on were strictly defined in advance, and the lectures of physicians and theologians were modelled on much the same lines, with only this difference—that for the physician Hippocrates took the place of Luther and Galen the place of Melanchthon as sources of inspiration.

Professors of medicine began their lectures in Latin at 6 a.m., so they may well be excused for having drifted into rather slovenly ways, just reading from a text faithfully taken down as dictation by students happy to absorb knowledge in so simple a way. But this easy system of conveying knowledge by dictating Latin quotations seems at one time to have incurred royal disfavour, for in 1621 King Christian IV complained that "we have also learnt that many of the professors spend most of their time in dictating what they have culled from various other authors in order to save themselves trouble." The royal rebuke continued: "The university is not specially founded for the maintenance of the professors, but solely to the glory of God and for the promotion of youth. We graciously adjure you to discontinue useless dictation so that you can get through your curriculum in the course of a year."

The lectures on medicine were confined to theory and not supplemented by demonstrations of patients, anatomical preparations, drawings, and the many other devices for relieving the monotony of the spoken word. A student could well become a doctor of medicine without having seen a single patient or learnt how to diagnose a disease. But he had wonderful opportunities to acquire facility in debate when he took part in *disputationes* on set subjects. Four times a year a professor of medicine had to supervise and guide medical students in such debates. In 1617 the subject of debate was: "Is the patient suffering from pleurisy to be bled on the diseased or healthy side at the onset of his illness?" This was a terribly knotty question, for Greek and Arabic authorities disagreed over it. Now, with the omniscience of to-day, it is easy to anticipate the correct answer to this question. Bleeding was to be undertaken on the healthy side at the onset of the pleurisy in order to convey

blood away from the diseased side. "To bleed on this side would merely mean a flux of new blood, a hyperaemia which would aggravate the inflammation."

CLAUDE LILLINGSTON.

A "SMOG" EXHIBITION

This month the Royal Sanitary Institute is staging at its headquarters at 90, Buckingham Palace Road, London, S.W.1, a seasonable exhibition illustrating "smog," its causes and effects, and the way to get rid of it. Large-scale models and diagrams impress the visitor with the results of investigations into atmospheric pollution, the damage it causes to health and property, and the advantages of smokeless fuels. From the experience of London last winter atmospheric pollution is not a diminishing quantity, but it is some satisfaction to know that at any rate its measure is being taken. Special instruments for measuring pollution are now established on 870 sites all over the country, and the amount of grit or deposited matter, of smoke or suspended matter, and of sulphur dioxide is carefully recorded. Local authorities, nationalized industries, and commercial undertakings to the number of 175 are co-operating regularly with the Fuel Research Station of the Department of Scientific and Industrial Research in this enterprise.

The effect of the week of "smog" in London in the early part of last December is driven home pictorially, statistically, and in other ways in this exhibition. The maximum concentration of sulphur dioxide in Westminster and eastwards along the Thames during that week was four or five times the normal, while the number of deaths in London ascribed to bronchitis, pneumonia, and diseases of the heart and circulatory system reached a startling level, more than two and a half times as high as the level of the previous week. Another exhibit shows the effect of atmospheric pollution on livestock. The bones of cattle which had grazed on pasture heavily contaminated with fluorine showed exostoses and other changes. Masonry is liable to attack, and this is well shown by stone from the Houses of Parliament, where the acid-laden smoke has destroyed the beautiful incised decoration. The same is true of metals. The British Iron and Steel Research Association demonstrates the results of tests on copper-steel and zinc at 16 sites in Great Britain, and the difference between the Surrey countryside and places like Sheffield from the point of view of corrosion is well brought out.

Belching Chimneys and Smokeless Zones

The domestic fire is arraigned by the National Smoke Abatement Society as responsible for half the 2,500,000 tons of polluting matter which is sent forth from the chimneys of Great Britain each year. An exhibit of smokeless fuels—anthracite, dry steam coal, gas, and hard cokes—points the way to a remedy, and shows also that hygiene is a paying proposition, for such fuels have a higher standard of heat efficiency. Diagrams also illustrate the creation of smokeless zones in which all pollution is prohibited. These can be of any size from a few acres upwards, including the square mile of the City of London, which it is proposed shall be one of them. Much also can be done in the factory to prevent air pollution, for instance, by the use of efficient dust and fume extractors. Another aid is a new type of fire door, developed at the Fuel Research Station, which is said to eliminate smoke and at the same time to increase thermal efficiency. In the ordinary way a Lancashire boiler will emit as much as 30 lb. of solid matter in an hour, and up to 15% of the heat in the fuel goes to waste.

The exhibition does not include means of individual protection such as have led to recent controversy; the effort is made to indicate causes, and in diagram, poster, and leaflet the solution looks simple. However, if any visitor is inclined to excessive optimism, he may be reminded that the very last patent taken out by James Watt was for the construction of a furnace in such a way as to avoid smoke. That was in 1785. The principle was all right; the difficulty lay in its practical acceptance. That is where the difficulty lies to-day.

Correspondence

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

Treatment of Tetanus

SIR,—In his article on the treatment of tetanus, Dr. J. H. McIntyre (*Journal*, October 17, p. 866) advocates active immunization of babies against tetanus at the same time as the routine immunization against diphtheria.

Mr. A. T. Glenny and I have investigated the antitoxic responses of young babies to a combined prophylactic containing purified diphtheria and tetanus toxoids and whooping-cough vaccine. We are indebted to Dr. N. R. Butler, of University College Hospital, for the clinical side of the work.

Of a group of 64 babies receiving three injections given at the ages of 6, 12, and 18 weeks, 61 had produced at least 1 unit of tetanus antitoxin per ml. at the age of 6 months, and the remaining three had shown satisfactory responses. All babies born with 0.1 unit per ml. or less of passive maternally conferred diphtheria antitoxin (cord-blood titre) responded actively to the diphtheria toxoid in the prophylactic. In some of those with higher cord-blood titres interference occurred through neutralization by the passive antitoxin, but a delayed response may take place.

Although the majority of babies would be adequately primarily immunized against both diphtheria and tetanus by the course we adopted, I would recommend that the first dose should be delayed until the age of 3-4 months. The dosage of the two toxoids was such as to give good immunity to both components in normal animals, however, not only reduces maternally conferred immunity, but upsets the effectiveness of the diphtheria toxoid but upsets the balance of the prophylactic: as a result additional interference with the diphtheria toxoid may occur because tetanus toxoid is then in excess.¹ By waiting until babies are 3-4 months old before starting immunization, the maternally conferred diphtheria antitoxin would have fallen sufficiently in almost all.

We hope to publish our results fully in the near future.—
I am, etc.,

MOLLIE BARR.

The Wellcome Research Laboratories,
Beckenham, Kent.

REFERENCE

¹ Barr, M., and Llewellyn-Jones, M. (1953). *Brit. J. exp. Path.*, 34, 12.

SIR,—I read Dr. J. H. McIntyre's paper on the treatment of tetanus (*Journal*, October 17, p. 866) with interest, and I would like to make some comments on the very important point he raises.

A study of papers published during the past few years on the treatment of tetanus with relaxants shows a higher proportion of recoveries than is usual in any large consecutive series treated by older methods. This might indicate that these new drugs were lowering the mortality, but allowance must be made for selection and the human tendency to publish successes rather than failures. Tetanus is a disease in which a comparatively accurate prognosis can be given 48 hours after the onset if certain observations are made, and provided that a large dose of antitoxin is given. Prognosis depends particularly on the presence or absence of the local tetanus involving either the eyes, face, or limbs; the severity and type of wound; the length of the incubation period; and the length of the period of onset. The incubation period is the time between receipt of the wound and the onset of the first symptom—usually trismus. The period of onset is the time between the onset of the first symptom and the occurrence of the first reflex convulsions.

Prognosis is invariably good when there is local tetanus and usually so if the wound is very slight. If prophylactic antitoxin has been given, and if the incubation period is more than 10 days. It is bad if the wound is severe and

heavily infected and the incubation period is less than five days. The period of onset gives the best indication of the severity of an attack. If this is less than 48 hours the prognosis is bad and the patient is unlikely to recover. If it is more than 48 hours there is a good chance of recovery and this increases with every hour the reflex convulsions are deferred. The above observations usually support each other—that is to say, a patient with a severe wound usually also has a short incubation period and a short period of onset and vice versa—but if there is disagreement the period of onset is the most reliable prognostic indication. As Dr. McIntyre states, both his cases were very severe, with incubation periods of four and six days respectively and a very rapid onset of reflex convulsions giving a period of onset of considerably less than 48 hours in both. Neither had any chance of recovery unless relaxants could have worked a miracle.

By contrast and using the same criteria, some of the cases which have been reported would manifestly have recovered on routine treatment whether relaxants had been used or not. In many the essential data by which prognosis could be assessed is omitted, and so the part played by relaxants in furthering recovery is not as clear as it might be. My own limited experience with mephenesin suggests that, although this relaxant is of considerable value in controlling or lessening the severity of spasms, especially in mild cases, it has little effect in very severe ones like those described by Dr. McIntyre. In one patient with a period of onset of about 48 hours in which the prognosis was borderline recovery occurred. Here mephenesin may have tipped the scales towards recovery, and it is probably in cases of this degree of severity that relaxants may save life.

The purpose of this letter is to urge that when reports of tetanus patients treated with relaxants are published all the above data should be included so that they can be used as a yardstick to assess prognosis and to give a more accurate estimate of the value of any drug used. In the present state of knowledge treatment of tetanus is but symptomatic. Death or survival depends almost entirely on the dose of toxin absorbed before antitoxin is given. It still remains to be seen to what extent relaxants combined with adequate control of respiration, as in anaesthesia, can lower the mortality.—I am, etc.,

LESLIE COLE.

Cambridge.

SIR,—It is obviously right that failures of a new form of treatment should be given as much prominence as are successes, and Dr. J. H. McIntyre (*Journal*, October 17, p. 866) does service in recording two fatal cases of tetanus in which muscle-relaxants were included in the treatment.

It has long been held that, when the incubation period is as short as a week, treatment of this disease is ineffective. I believe that the proper use of the muscle-relaxants may enable us to change our outlook, and I am sorry that Dr. McIntyre should support the fatalistic attitude on the experience of his two cases. These, as he says, do not make impressive reading, but I suggest that the potentialities of the muscle-relaxants were not exploited to the full. The exaggerated motor activity of tetanus can be treated either by drugs which act centrally—the narcotics; or by those which act peripherally—the muscle-relaxants. The narcotics all act on those parts of the central nervous system which are already being attacked by toxin and are therefore harmful. The enormous potential value of the muscle-relaxants lies in the fact that they can defeat spasm without lowering vitality. They are difficult to give properly, because the amount needed to counter spasm may be enough to paralyse breathing; and because the amount needed to achieve the best balance in any patient may vary widely from minute to minute. These two difficulties can be met by the provision of positive pressure assisted ventilation whenever the breathing muscles have to be paralysed and by the use of a muscle-relaxant whose intensity of action can be varied from minute to minute to meet the changing need. Succinylcholine is such a drug; curare, gallamine, and mephenesin are not.

The main cause of death from tetanus is usually respiratory infection but with anoxic episodes, exhaustion, and toxæmia as important contributory causes. This is because the tetanus toxin acts on the medullary nuclei, particularly on the nucleus of the vagus, so that the actions of the larynx and pharynx become disorganized. There is thus difficulty in swallowing, and spill-over from the pharynx into the tracheo-bronchial tree, with resulting respiratory infection. The best safeguard against this is early tracheotomy, and I believe this should be done in all cases of severe tetanus, not only because it lessens the likelihood of infection, but also because it prevents that constant irritation from bronchial secretions which accounts for much of the spasm.

If we adhere to the principles of early tracheotomy, assisted respiration, *continuously controlled relaxation*, and the restriction of central depressants—coupled, of course, with adequate doses of antitoxin—we may be able to save cases which would formerly have been regarded as hopeless. One patient was recently treated on these lines and she recovered.¹ Her illness was less severe than those described by Dr. McIntyre; but the methods used might bring some hope where previously there was none, and this letter is a plea for them to be tried.—I am, etc.,

Bristol.

RONALD WOOLMER.

REFERENCE

- ¹ Woolmer, R. F., and Cates, J. E. (1952). *Lancet*, 2, 808.

Heartburn in Pregnancy

SIR,—In your annotation on heartburn in pregnancy (*Journal*, October 17, p. 873) you refer to nine cases of hiatus hernia in pregnancy described by Dutton and Bland and you state that "heartburn in pregnancy may therefore be of some importance."

We have tried for a long time to convince doctors that the subject is indeed of great importance, and in the *Lancet* we went so far as to say that we believed the key to the whole problem of incompetence at the cardia lay in the study of these cases.¹ At present we are reviewing 55 cases of hiatus herniation found in pregnancy two years ago.

We still consider that regurgitation and not herniation is the main factor in the production of symptoms. Further, it seems likely to us that this massive regurgitation of gastric contents, so common in pregnancy, may be a very important factor in the aetiology of early post-anaesthetic chest complications in pregnancy. It certainly produces nocturnal cough in many of these cases and it may be that with the abolition of the cough reflex under anaesthesia aspiration of the regurgitated fluid causes "spill" pneumonia. We are studying this subject, but because of the great frequency of heartburn in pregnancy and the difficulty, therefore, of obtaining figures of statistical significance the problem should be studied by many workers.

It would be a great help if someone would determine the true incidence of heartburn in pregnancy, paying strict attention to the definition of the term. With regard to the observation by Williams² that prostigmin is effective in treatment, we have injected prostigmin during the screening of patients but have failed to demonstrate any change in the appearance of the hernia or the volume or frequency of the reflux. We have not been able to relieve the symptoms by the use of prostigmin.—I am, etc.,

Bickley, Kent.

N. D. MCCREATH.

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- ¹ Lawler, N. A., and McCreath, N. D. (1951). *Lancet*, 2, 369.
² Amer. J. Obstet. Gynec., 1941, 42, 814.

Venepuncture in Young Children

SIR,—Dr. I. A. B. Cathie, in his article on venepuncture in the "Clinical Pathology in General Practice" series (*Journal*, October 24, p. 930), says, when writing about infants, "From birth to the age of about 3 years visible or palpable veins cannot be expected, and some other approach must be made." I must dissent from this view. I find that in the majority of cases veins are palpable in one or other antecubital fossa, even if not visible, and it is more often than not easy to get blood in quantity using the same

technique as for adults, even in infants 24 hours old. I think it is so generally assumed that venepuncture at this site in infants is difficult that it is not even explored. A palpable vein here saves much time and trouble. I find that a needle and attached rubber tubing is easier to use for this purpose than a syringe. Needless to say, the vein is not visible nor palpable except with pressure from above. It is not necessary to see the vein, but it must be palpable, and usually is.—I am, etc.,

Canterbury.

I. B. MORRIS.

SIR,—Dr. I. A. B. Cathie's advice to general practitioners on the withdrawal of blood from infants and young children (*Journal*, October 24, p. 930) is valuable technical instruction, and it is true that if a slick technique is acquired the whole procedure can be finished before the patient has had time to feel more than a little fear. On the other hand, as he admits, it does not always go easily, and surely the occasions when it is necessary to obtain blood from infants outside a children's ward must be so rare that the general practitioner can hardly hope to become expert unless he has had previous experience.

The venepuncture is thus quite likely to be unsuccessful at the first attempt, as it is even in a children's hospital. But Dr. Cathie has omitted any mention of possible harm from prolonging the procedure, for he says: "The traverse beneath the sternomastoid can then be repeated until the vein is entered," and, "If the attempt at venepuncture is unsuccessful on one side of the neck the same procedure should be carried out on the other," without giving any time limit. The actual pricks may not be very hurtful, but the child is too young to know that no more serious attack is to be made upon him. The fear engendered in the 2-year-old by immobilization in a blanket, the sight of the weapons, and the sometimes grim expression of the operator who wishes it was all over may cause lasting harm to a few children under certain circumstances. At the least, it makes the child afraid of doctors for a time, which is a disadvantage at the next consultation.

Venepuncture of infants and young children is necessary sometimes, and any harm it may do is usually trivial, but I should like to suggest that (a) it is done only when the doctor is quite certain that it is really necessary, (b) that the armamentarium is kept as much as possible out of sight, (c) that if it fails after a reasonable three-minute attempt it is abandoned for the day, and (d) that the doctor himself shows affection for the child afterwards in some way in order to counteract any impression that the thing is a punishment.

Dr. Cathie says towards the end of his paper that "failure to obtain blood can be the most exasperating and humiliating experience." He is referring to the person on the right end of the syringe.—I am, etc.,

London, S.E.1.

D. G. VULLIAMY.

Cortisone and A.C.T.H.

SIR,—As a contribution to the discussion on the value or otherwise of these hormones in the treatment of rheumatoid arthritis, I give my experience of their use in 37 cases, treated in 1949 and 1950, and (apart from two patients aged 74 and 72 respectively, who died in 1951 of cerebral haemorrhage) examined or made contact with in 1953.

Careful selection of patients, to exclude pre- or co-existent tuberculous or focal infection, or poor psychological background, was exercised. All cases were treated in hospital, with the continuous co-operation of a physician colleague, the director of pathology, and the physiotherapy department. In these patients all the usual, and many of the unusual, forms of treatment had been employed, to the limits of polypharmacy, without material benefit. The hormones were supplied by relatives overseas, care being taken to ensure that, so far as possible, maintenance amounts should be available.

The results fall into three groups: (1) *Failures*.—Seven cases, where no response was obtained, or where alleviation was transitory, and not recovered even on larger doses of either hormone. (2) *Moderately Improved*.—Twenty-four cases, patients who have resumed their daily activities, in relative comfort and competence,

of whom eight were formerly bedridden or house-bound. The average maintenance dose is 75 mg. (three tablets) of cortisone, or, in a few cases, 10 units of A.C.T.H. per week. (3) *Complete Relief*.—Six cases; none of these patients has required a maintenance dose in the last two years; in three, no cortisone or A.C.T.H. has been called for in three years, and all live physically active lives.

Laboratory control is a necessary adjunct, especially with regard to the blood picture. It is useless to give either hormone where a significant degree of anaemia or reduction in cell volume exists; but neither the sedimentation rate nor the eosinophil count gives a constant guide to progress. Further, any alteration in the sodium/potassium balance is seen earlier clinically in loss of muscle tone than in the laboratory return. For these reasons daily observation of the patient in hospital is, in my view, essential.

Apart from the failures and the case noted below, side-effects have given no concern. Disturbance of water balance and oedema have been overcome by reduction of the fluid intake, by administration of 5 g. potassium chloride daily taken as table salt, and, if necessary, a brief intermission in administration; obesity, by control of diet; psychological aberrations, by care in selection of patients, eliminating the emotionally insecure.

Cortisone administration is essentially substitution therapy; A.C.T.H. stimulates the activity of the adrenal cortex and is effective only in so far as this has not atrophied and can respond. All six cases in group 3 had a four-day course, 20 units daily of A.C.T.H.; and I have the impression that its use is responsible for their "cure" and for the small maintenance dose of cortisone required in the patients in group 2. With the introduction of long-acting "acthar gel," a daily injection of 10 to 20 units makes treatment much easier, and it should, I believe, be tried.

Two cases call for special mention. One from group 1 had given a response to no therapy during seven years, including cortisone and A.C.T.H. His own doctor tried phenylbutazone ("butazolidin") with dramatic success, so that after five months the circumferential measurement of one knee had been reduced by 4 in. (10 cm.). The other, in group 3, had become acromegalic following a fractured base of skull 20 years previously, and was now the subject of active rheumatoid arthritis of polyarticular type, with massive effusion in both knees. The fact that she had formerly suffered from "nervous breakdown" was not forthcoming. After seven days' treatment by A.C.T.H., preferred on the theory that some degree of pituitary atrophy existed, she spent two nights writing poetry, which, believed by her to be original, was actually a reproduction of portions of the *Oxford Book of English Verse*. After an anxious 48 hours, the psyche returned to normal. Later, small doses of cortisone were substituted for A.C.T.H. and continued for four months, with much success. She has had no hormone—and no return of symptoms—since July, 1949, and has nearly full functional activity.

A number of patients included in this series (having read *The Times* extract (October 2) of the articles in the *Practitioner*)² have asked me to put forward this analysis. The joy of being able to get about and resume some degree of social and economic activity after being house-bound for considerable periods is something that the ordinary uninhibited individual has difficulty in appreciating fully. But I have no clue as to why the failure to respond was complete in the seven cases of group 1.—I am, etc.,

Sunderland.

W. GRANT WAUGH.

REFERENCES

- ¹ Dunlop, D. M. (1953). *Practitioner*, 171, 343.
² Tegner, W. (1953). *Ibid.*, 171, 424.

Treatment of Laryngeal Carcinoma by Radium Insertion

SIR,—I agree with Mr. W. Douglas Harmer (*Journal*, October 3, p. 735) that good results are obtained by radium insertion for laryngeal carcinoma, although I use a different method. In principle the technique is as follows.

The thyroid cartilage opposite to the lesion is drilled at its anterior end and three needles 1 cm. apart are inserted between the cartilage and parallel to the affected cord. Ellis¹ first described this technique for radon, and later I described it for radium,² adding a perspex stabilizer to ensure a parallel arrangement of the needles. The technique of loading a hollow needle-sheath can be altered to suit the size of the larynx and can deal effectively with lesions of the anterior commissure. It is likely that the physical distribution of

dosage is more accurate and homogeneous than that employed by Harmer.

In a small series of cases treated from 1-4 years, all remain well with no evidence of cartilage necrosis. This technique is used in preference to external irradiation, and the amount of upset to the patient is about equal to that of Harmer's method.—I am, etc.,

London, W.1.

REFERENCES

- ¹ Report of British Empire Cancer Campaign, 1949, p. 142.
² J. Fac. Radiol. (Lond.), 1951, 2, 206.

ANTHONY GREEN.

The Broken Acrylic Head

SIR,—I was interested in Mr. K. H. Pridie's letter (*Journal*, October 24, p. 939), as I have also been trying to overcome the faults that he mentions in the standard type of acrylic femoral head and have designed a prosthesis which appears to be rather similar to the one he illustrates. The usual pattern has a further disadvantage in that it transmits the weight to the narrow rim of the neck of the femur, which affords so small an area that bone absorption from excessive pressure must be expected, and indeed does occur.

The stem of the prosthesis shown consists of two flat plates joined together by a cross-member giving an H-shaped section which provides a maximum area for bone contact. The lower and inner plate lies on the calcar femorale, transmitting the weight directly to it along the normal lines of weight transmission, while the upper and outer plate affords counter-pressure against the outer cortex of the femur. The plate forming the base of the neck of the prosthesis also transmits weight to the upper cut surface of the calcar femorale. To reduce weight the rest of the neck and the interior of the hollow metal head is filled with resin. Thus the prosthesis is married to the femur along the normal lines of stress and transmits the weight over a large area. Moreover, being tapered, it will reseal itself if any bone absorption should occur. A possible disadvantage is that its point of junction with the femur is further away from the centre of movement and must therefore be subject to greater stress. Only time will show whether this factor outweighs other advantages of this type of prosthesis.—I am, etc.,

London, S.E.1.

T. T. STAMM.

Mammary Abscess

SIR,—Following my recent plea (*Journal*, July 11, p. 98) for an investigation into the epidemiology of staphylococcal infections in maternity hospitals by means of bacteriophage typing, my attention has been drawn to the work of Dr. J. C. Colbeck,¹ who has done precisely this. His work appears to have attracted little attention in this country, although it was published in 1949, and its practical application is obvious.

Dr. Colbeck has shown that the infant may acquire in the nursery a pathogenic strain as early as 24 hours after birth or much later depending on its contacts. Undoubtedly the common source is another infant whose nasopharynx harbours the particular strain. Thereafter the feeding infant infects directly the mother's nipple. This explains perfectly



the apparent anomalies and provides the solution not only to mastitis in the mother but to staphylococcal ophthalmia and pemphigus in the infant. Its lesson is perhaps applicable to other problems such as neonatal dysentery. If for no other reason, hospital nurseries should be abolished and the infant should at all times remain in the same cubicle as the mother. In the interests of child psychology, etc., the principle of the child being with the mother is observed in some hospitals, but it is almost certain that the infants are collected together at times for certain purposes, which defeats the whole object so far as infection is concerned. May I commend Dr. Colbeck's paper to those administering our maternity hospitals?—I am, etc.,

Kirkcaldy.

JAMES R. W. HAY.

REFERENCE

¹ *Canad. med. Ass. J.*, 1949, 61, 557.

Liver Biopsy

SIR,—Your annotation (*Journal*, October 17, p. 874) gave an admirable account of the present attitude towards liver biopsy, but one or two comments could be a little misleading. The mortality of liver biopsy is commonly supposed to be high (one frequently hears figures of 1–5% being used as arguments against using this investigation), and your reference to Davis,¹ who in 1946 discussed 4 deaths in 483 biopsies by various people, might foster this misconception. A more recent analysis of over 10,000 biopsies performed with modern techniques revealed a mortality of 0.12% and a significant morbidity of 0.32%.²

The statement that the abdominal route is "clearly safer in that the needle can more freely enter the liver" is possibly true, but one may add that with this route the needle can also more freely enter the gall-bladder, the stomach, and the colon. Most operators have now abandoned the dangerous subcostal route in favour of the intercostal approach except occasionally in gross hepatomegaly.

The description of biopsy material as 2–3 mm. in diameter would be unfortunate if it encouraged anyone to experiment with such large needles. I think you will find that needles with internal bores greater than 2.0 mm. are no longer used. The popular (but inefficient) Vim-Silverman needle has a bore of only 0.9 mm., although its outer needle is much larger. To use a bore greater than 2.0 mm. is to court disaster. Liver biopsy is rather more valuable in focal disorders of the liver than you suggest. In metastatic and granulomatous disease of the liver, an adequate specimen is diagnostic in 70–90%, depending on the technique employed. Provided a negative biopsy is not regarded as proof of normality of the whole liver, no error or confusion should arise. In addition to the value of liver biopsy in diagnosis, one may point out that it may be employed with great advantage and negligible risk in the management of a sarcoidosis, hepatic tuberculosis, chronic brucellosis, fatty metamorphosis of the liver, and the protracted case of viral hepatitis.—I am, etc.,

London, E.C.1.

RICHARD TERRY.

REFERENCES

¹ Davis, W. D., et al. (1946). *Amer. J. med. Sci.*, 212, 449.² Terry, R. (1952). *British Medical Journal*, 1, 1102.

Treatment of Malaria

SIR,—It has been suggested by Dr. R. Y. Taylor in a letter from Kenya (*Journal*, August 1, p. 285) that general practitioners in the Tropics could usefully make their records available to research workers and others. This almost echoes a similar request of mine.¹ I feel, therefore, that I should offer an account of nearly thirty years' experience of malaria treatment, in the hope that others also will contribute to help to clear up the confusion which undoubtedly exists and was referred to recently by my old friend Sir Philip Manson-Bahr (August 1, p. 284).

Thirty years ago there was one treatment for malaria: quinine, with its different salts—sulphate, hydrochloride, and hydrobromide. The last was thought to produce less tinnitus, but was seldom effective. Quinine remains the quickest drug to bring down temperature, but it is far from

being the safest. Since the war not a single case of blackwater has shown up here, and this is probably owing to the fact that quinine is now used only in an emergency. During the Japanese occupation our fever hospital saw several cases of blackwater precipitated by alkaloids other than quinine. Just before the war three blackwater cases gave a history of having followed the use of "atebrin." On analysis, samples bought from the native shops where these tablets were said to come from were found to contain a yellow powder and 1½ gr. (0.1 g.) quinine. The maker's name overlapped the tablet, and both the size and colour differed from the original.

Almost everybody has now given up using quinine except in emergency, when it is given slowly by injection intramuscularly. Anyone who favours quinine injections should try giving themselves one. I did it about 25 years ago as an emergency, and have not had one since: only a painful memory remains and a nodule. Quinine treatment in those days meant a course of 10 gr. (0.65 g.) thrice daily for one month, followed by 10 gr. twice daily for another month, and finishing with a daily dose of 10 gr. during the third month. It was normally given in capsule; the acid mixture frequently produced gastric irritation. An Italian patient preferred to drink bottles of quinine, iron, and arsenic, without any apparent ill effect. Several of the older planters spoke of taking as much as 90 gr. (6 g.) a day, and others took a drachm (4 g.) whenever they felt a rigor coming on. But most of these heroes knew nothing of bloodslides and parasites, and many died from blackwater.

If a patient relapsed on quinine sulphate, he was then given a course of the hydrochloride, or another quinine salt like quinidine sulphate. Intravenous N.A.B. was very effective for relapses. Pamaquin ("plasmoquine") came to our aid about the year I came to Malaya, and I remember being presented with a bill for extractions and a denture, said by my patient to be necessary as the result of pamaquin poisoning. This was soon followed by "quino-plasmoquine," one of the best pre-war treatments for relapsing malaria, but few of my patients could stand the full course of four or five tablets daily for a month, as originally recommended by the makers. A modified course, however, gave very satisfactory results in both vivax and falciparum malaria. Quartin is very rarely seen out here.

Then came mepacrine, originally called atebrin, and we used it with great care and in moderation, for it was known to produce yellowing of the skin, which, although not important, was not appreciated by the patients. But we soon found that in a few rare cases it produced mental excitement, sometimes requiring psychiatric treatment. Why it now can be used apparently harmlessly for such conditions as lamblia in very much larger doses is difficult to appreciate. Malaria subjects who appeared to be unaffected by continuous quinine often did well on mepacrine, but it was disappointing as a prophylactic in small doses.

Then the Japanese invasion came, and all the progress in malaria relapsed to where it had been more than twenty years previously, and like those of most others my records, which included over 100,000 spleen palpations, disappeared into oblivion. But the war brought a big improvement in malaria treatment, and since then for some unknown reason, a subject of many medical discussions, malaria in Malaya has been no longer the very serious problem it used to be. Larvae surveys usually produce only few finds, whereas thirty years ago they were prolific.

Since the war mepacrine and proguanil have been used as a treatment for both vivax and falciparum infections. Three mepacrine tablets (100 mg. each) are given daily for three days, followed by three proguanil tablets daily for three days. To complete the course, I usually give a daily tablet of proguanil for one week. I cannot give any accurate relapse rate figures for this treatment, but am satisfied that it is not high.

Of the chloroquine products, I favour camoquin because it is easy to take (three tablets) and has a very low relapse rate. "Resochin" and "nivaquine" have given similar results, as one would expect from their similar formulae. Pyrimethamine ("daraprim") has proved rather disappointing. I do not wish to infer that the other chloroquines are not any good; they may be better. I mention those giving satisfaction out here, which I have used in my practice.—I am, etc.,

Johore Bahru, Malaya.

NORMAN DUGDALE.

REFERENCE

¹ *British Medical Journal*, 1948, 2, 620.

Control of Tachycardia by Quinine

SIR,—Like Dr. P. R. Boucher (*Journal*, September 26, p. 727), I have had paroxysmal tachycardia from drinking coffee, but also, like Dr. H. L. Maclure (*Journal*, August 29, p. 511), I have successfully treated a case with quinine.

A woman of 77, who had had much malaria and dysentery in India but remained strong in body and spirit, came under my care three years ago with a history of frequent and severe bouts of paroxysmal tachycardia, sometimes lasting all day, for two years. Cardiologists had investigated her heart and found it normal. She had had "all sorts of x-rays." She stated that quinine and digitalis were poison to her, and resented having been instructed, when these drugs failed, to take phenobarbitone and pull herself together. The patient stated that an attack was often preceded by a feeling of distension below the left costal margin. A barium meal showed a single diverticulum at the splenic flexure. Having seen the patient in a number of attacks, and confirmed that simple measures were ineffective and that various forms of digitalis by mouth, digoxin intravenously, and quinine by mouth would all terminate an attack, but only by producing violent and alarming vomiting, I tried carbachol, and this usually terminated an attack, at the cost of tolerable diarrhoea instead of intolerable vomiting. Efforts were now made to prevent distension of the diverticulum by means of a low-residue diet, the regular administration of liquid paraffin and "laka-diastase," and courses of phthalylsulphathiazole. There was a reduction in the frequency of the attacks, but it was only when the patient took quinine hydrochloride 5 gr. (0.32 g.) three times a day that they became really infrequent, occurring at intervals of months instead of days. The lady is now 80 and her failing memory and pride cause her to prove the efficacy of these measures, because her attacks now occur when the medicines have not been taken for a few days.

I have not tried to terminate an attack by the injection of quinine bihydrochloride.—I am, etc.,

DAVID MILWARD.

Farnham Common, Bucks.

REFERENCE

¹ White, Paul (1944). *Heart Disease*, 3rd ed. New York.

SIR,—The reaction of Dr. P. R. Boucher (*Journal*, September 26, p. 727) to Dr. H. L. Maclure's letter (*Journal*, August 29, p. 511) has stimulated me to draw the attention of your readers to the fact that quinine, not quinidine, was originally used in various abnormalities of the cardiac rhythm. In 1912 Wenckebach¹ discovered—more or less accidentally—the beneficial effect of quinine in some types of irregular action of the heart. His disciple Frey also studied this phenomenon, and he, together with Wenckebach, showed² that quinidine—the dextrorotatory isomer of quinine—acts almost twice as potently as does quinine. Since then quinidine has come to the fore in cardiology, but quinine is still used in some cardiac patients, often in combination with other drugs.

It is therefore quite possible that the paroxysmal tachycardia which Dr. Maclure describes in his patient was indeed controlled by the daily prophylactic use of quinine, but surely it is not necessary to assume that the use of proguanil was in one way or another connected with the patient's tachycardia, as Dr. Boucher has suggested.—I am, etc.,

Amsterdam.

C. W. F. WINCKEL.

REFERENCES

¹ *Die Unregelmässige Herzthätigkeit*, 1914. Vienna.² *Berl. klin. Wschr.*, 1918, 55, 450.

Histoplasmosis in Great Britain

SIR,—In a paper under this title, Dr. S. Locket and his colleagues (*Journal*, October 17, p. 857) reject as "very doubtful" a case of histoplasmosis from Africa, reported in England by me.¹ May I point out that this was a proved case of histoplasmosis, the diagnosis being based on the identification of the causative fungus in culture isolated from the lesion, and on the histopathology of the lesion.

This strain of *Histoplasma*, in its normal mycelial form, presented the specific morphological characters of *Histoplasma capsulatum*, but in the yeast phase, both in parasitic life and in culture, large forms developed which, although occasionally to be

found in *H. capsulatum*, were much more marked and more constant in this tropical African strain. After prolonged study of the fungus in culture and in experimental disease I concluded that it could be distinguished from *H. capsulatum*, of which it was a stable variety, probably peculiar to tropical Africa. This opinion was borne out by the discovery and study of other cases of this form of histoplasmosis in various parts of tropical Africa. Recently Vanbreuseghem² accorded this variety specific rank under the name *Histoplasma duboisii*. The original strain isolated by me in 1943 is still available.

Including the case of histoplasmosis described by Locket and his colleagues, but not the one referred to at the conclusion of their paper, five well-authenticated cases of histoplasmosis have been identified in Great Britain since 1941. In all five cases there was a history of residence abroad in a warm climate; in three the disease was unquestionably contracted abroad; and in the other two there was no evidence that the infection was incurred in Great Britain. In fact the results of epidemiological surveys with the histoplasmin skin sensitivity test have failed to indicate the existence of endemic histoplasmosis in Great Britain.—I am, etc.,

Rickmansworth, Herts.

J. T. DUNCAN.

REFERENCES

¹ *Trans. roy. Soc. trop. Med. Hyg.*, 1947, 40, 364.² *Ann. Soc. belge Méd. trop.*, 1952, 32, 569.

A Human Blood-group Chimera

SIR,—I have read with the very greatest interest the report in the *Journal* of July 11 (p. 81) of a human blood-group chimera by Mr. I. Dunsford and others, together with your annotation (p. 89) on the subject. You mention a number of implications of this observation, but there is another to which I wish to draw attention.

It has been shown by Medawar and his colleagues¹ that skin homografts interchanged between non-identical twins in cattle may survive permanently, and I would venture to predict that if the twin of the blood-group chimera, reported by Dunsford, were still alive and skin homografts were made from one twin to the other these would probably survive permanently. It is clearly impossible to test this particular hypothesis, but it would be of great interest and importance to undertake reciprocal skin homografts if further blood-group chimeras are found. We are looking out for suitable cases here, but as the phenomenon is apparently a rare one I am writing to you in the hope that if the opportunity to perform an experiment of this kind arises elsewhere it should not be neglected.—I am, etc.,

M. F. A. WOODRUFF.

Dunedin, N.Z.

REFERENCE

¹ *Heredity*, 1952, 6, 201.

A Danger of Succinylcholine Chloride

SIR,—At the close of an emergency operation performed at another hospital, under succinylcholine chloride ("sco-line") drip with gas-oxygen anaesthesia, administered by one of us (J.W.M.) the drip was turned off by the anaesthetist but had not yet been disconnected when a surgical colleague restarted it, ignorant of the fact that the bottle contained 0.1% succinylcholine chloride.

In the hope of preventing an occurrence of this type of accident (which in the above case did not prove fatal) discussions with colleagues, the theatre sister, and the pharmacist have resulted in the adoption of the following safety precautions. The use, for succinylcholine chloride drip solutions, of transfusion bottles different in size and label from those normally used for ordinary intravenous saline therapy. Immediately the succinylcholine has been added to the bottle by the anaesthetist, a special stick-on "caution label" is applied to the bottle by him. This label is 3 in. by 2 in. (7.5 cm. by 5 cm.), red-edged, printed in bold red lettering on a white background, and worded as follows: "Caution. Succinylcholine muscle-relaxant has been added to this bottle."—We are, etc.,

J. W. MONRO.

W. K. SLACK.

London, E.11.

Heparin in Intravenous Infusion

SIR,—I would like to support Mr. H. F. Smith's suggestion (*Journal*, September 5, p. 569). I have followed a similar course for a number of years with advantage and without mishap. I have been in the habit of adding 0.5 ml. of the 1,000 units per ml. strength to each pint (0.57 l.), making 500 units per pint (0.57 l.). Run in at the usual rate of 40 to 60 drops per minute, or 0.57 l. in three to four hours, the clotting time was unaffected in 10 cases investigated. One got the impression that the life of drips, especially the more sticky ones of blood and glucose, was appreciably prolonged. To confirm this, heparin was added to alternate infusions required in a general surgical ward. Infusions which stopped before the fluid therapy was completed were compared in the two series, others being ignored. In a total of over 70 infusions the superiority of the heparin-treated fluids was not so marked as one had expected. Unfortunately, I have not the figures to hand, and in any case I understand they were of little significance statistically.

I would like to add a note of warning. I make a point of adding the heparin myself or entrusting it to a reliable assistant. At the same time a label is stuck on the bottle stating that 500 units of heparin has been added. This is to avoid further doses being added by people who know "he likes heparin in his drips."

I have seen a dose of 100,000 units of heparin—that is, ten times the standard dose—given intravenously, by mistake, at the end of an operation for ligation of the femoral vein because of recurrent emboli. There was no doubt about the massive haematoma that developed in the wound. However, after evacuation of the blood clot there was minimal bleeding and the wound healed well after secondary suture. No doubt as the haematoma increased in size the pressure on it increased, which tended to stop further bleeding; in any case, the action of heparin given intravenously only lasts for three to four hours, the clotting time of the blood then returning to normal. Though this set of circumstances may not hold in all cases, I feel that perhaps the dangers of bleeding after the use of heparin have been over-emphasized.—I am, etc.,

Nairobi.

ANDREW HICKS.

Any Complaints?

SIR,—While endorsing wholeheartedly your leading article (*Journal*, August 29, p. 479) that medical students, and in particular those least likely to end up in general practice, should receive first-hand instruction in the conditions of it, may I protest against your suggestion that they should learn "what patients first complain of"? I believe that patients do not complain of their symptoms until we as a profession teach them to do so. They may complain of their neighbours' wireless, but they simply "have" a rash or a pain until we suggest the term complaint, with its innuendo of responsibility lying either with the doctor or more broadly with the Health Service and the community at large. Thus we sow the seed which may blossom as neurosis and bear the fruit of litigation.

Certainly our clear duty is to relieve our patient's symptoms, and, if possible, help him so to alter his external and internal milieu that his disease or injury may cure itself; but seldom shall we help him by accepting, or suggesting to him that we accept, the responsibility for it. Well equipped as we may be to kill micro-organisms and set fractures, a large part of our function is to help our patient to tolerate his disease so long as it may last. "This is your pain"; "This is your skin's reaction to its environment"; "This I can offer to help your body to recover." "What have you come to see me about?" may be bad grammar (though not worse than, "What are you complaining of?"), but at least it is good medicine and can be followed by a discussion of symptoms as a matter of mutual interest and concern free from the emotional tone of plaintiff and defendant.—I am, etc.,

Bradfield, Berks.

G. A. BECK.

Cancer and the Public

SIR,—I beg the favour of your pages to answer the multiple criticisms of my letter (*Journal*, October 3, p. 779).

Dr. Sidney Russ (*Journal*, October 17, p. 883) is not a "doctor" but a distinguished physicist, yet he exhibits a strange inconsistency when, as such, he insists on using wrongly the word "cure"—the obvious cancer may be surgically removed but the pabulum on which it grows remains, as do often the malignant cells which have been disseminated throughout the body. These by their growth may become manifest in a few weeks, a few months, or years, and we have no means of preventing it and often no means of detecting it until the end is near. He must know that some of these "5-year cures" merely continue with a disease a rather pitiable existence, at least as pitiable as those who have had no "cure" but continue to live for 7–10 years. All I ask to be told is the truth, not what is considered by some to be expedient, since it has but a temporary basis and permits and encourages a tremendous amount of useless expensive repetition. Dr. E. D. Y. Grasby (*Journal*, October 17, p. 883) can rest assured that I would quietly take all those measures which good medicine dictates, for I am at least as keen on a cure for cancer as any propaganda enthusiast is, but I believe that knowledge is so widespread that the patient is at least as safe for guidance in treatment in the hands of a sound practitioner, since he is not so obsessed or blinded by scientific aids on which the specialist solely relies.

Dr. Grasby states, "It is to allay such fears [of cancer] that education may be of service," but in a later paragraph to combat my statement that "the major manifestations of syphilis have been abolished even though secrecy and not propaganda has dominated treatment," he states: "Surely neurosyphilis may be completely incurable even with the most violent treatment." Most doctors would agree that if the public were told this it would hinder and not help to induce patients to come for treatment; though my statement, which is true, would. Propaganda for cancer has always increased the fear of it—it has led many healthy people to seek "check-ups"—but it will never induce the doctor who is a sufferer or a layman who has seen some of the results of treatment to divulge that which he knows is feeding "on the pith of life."

Let me reassure "A Grateful Patient" (p. 883) that I am fully alive, as are all general practitioners, to the benefits available from surgery where the cancer is occluding a vital tubular structure—the sooner a necessary plumber's job is done the better—and to comfort him further by telling him that I have a patient alive more than 20 years after resection of such a lesion of the colon. But that patient, like him, had complained of signs and symptoms which indicated the possible site of the lesion and she had the desirable surgery.

Are we to understand from Dr. John McFarland (*Journal*, October 24, p. 936) that the ignorance of the general practitioner was responsible for the patient's death? Let me comfort him and Sidney Russ with the words of a dying surgeon, Mr. Percy Furnivall: "The surgical part of my case was trivial and painless. I would not wish my worst enemy the prolonged hell I have been through with radium neuritis and myalgia for over six months. . . . For an old man with an early growth to have an adequate surgical operation only would be well worth the possible extra risk of recurrence," and his obituary notice¹ ran: "He formed the opinion that the treatment he had undergone had increased his suffering and made his passing more difficult, and he wished in his love for humanity to save others from a like fate."

The personal experiences of William Gosse² are of a similar nature, and they still continue.—I am, etc.,

Birmingham, 15.

JAMES F. BRAILSFORD.

REFERENCES

- ¹ *British Medical Journal*, 1938, 1, 450.
- ² *Ibid.*, 1938, 1, 1076.
- ³ *Ibid.*, 1938, 1, 643.

Orthopaedic Care in Poliomyelitis

SIR,—It is always regrettable when senior members of our profession resort to bickering in public, and the present controversy between orthopaedic surgeons and Dr. Ritchie Russell is no more seemly a passage of arms than was to be expected. In the Leeds region for the past six years poliomyelitis has been treated by the combined and harmonious efforts of a consultant in infectious diseases, a neurologist, a research anaesthetist, and an orthopaedic surgeon in a team whose members have not yet had occasion to be jealous of each other's contribution. It would seem that a similar pattern of working in the treatment of poliomyelitis would be to the benefit of the country at large.—We are, etc.,

HUGH GARLAND.

JOHN M. P. CLARK.

Leeds.

POINTS FROM LETTERS

Sweating in Shock

Dr. J. S. H. WHITEHEAD (London, S.E.22) writes: The fact that sweating occurs under certain conditions in anaesthetized persons was said by your expert ("Any Questions?" *Journal*, August 29, p. 520) to be "teleologically unfortunate." Dr. Ronald Woolmer (*Journal*, October 10, p. 832) took exception to this on the ground that it was merely ignorance of the whole truth that made it appear so. Surely the term "teleologically unfortunate" is self-contradictory, for according to Webster's dictionary teleology is the theory that the phenomena of organic life are explicable only by purposeful causes.

The Couvade

Dr. THEODORE LOUCAIDES (Nicosia, Cyprus) writes: With reference to the correspondence published about the custom of the couvade (*Journal*, August 23, 1952, p. 454, September 6, 1952, p. 555, and September 20, 1952, p. 667), I suggest that the following may be the origin of the hitherto unexplained custom. According to Plutarch (*Theseus*, 20), Theseus on his way back to Athens from Crete was blown by the winds to Amathus (now Limassol, Cyprus), where he was obliged to leave Ariadne (the daughter of Minos) because she could not continue her voyage to Athens (she was pregnant and suffering excessively from seasickness). At Amathus Ariadne could not bear being abandoned by Theseus, and she fell into marasmus and died during labour. She was buried at Amathus in the forest of Ariadne-Aphrodite. When Theseus returned to Amathus to fetch Ariadne he was informed of the unhappy event, and before leaving Cyprus he erected two statues and inaugurated a feast in honour of Ariadne. He left money to the Amathusians so that they might celebrate the feast annually. As a result of this feast Ariadne came to be worshipped at Amathus as a goddess of midwifery, and women honoured her statues representing a woman holding a baby in her arms. The feast was held during Gorpheos month (latter half of August and first half of September), and during it a man lay down and cried and acted as a woman in labour.

Acute Inversion of the Uterus

Dr. B. BHATTACHARYA (Darlington) writes: I read with interest Dr. J. F. Enright's report of a case of acute inversion of the uterus (*Journal*, September 26, p. 714). I have made a study of this subject based on nine such cases, and I entirely agree with Dr. Enright that quick and gentle reposition of the inverted uterus is the secret of success. In my opinion this should be done as soon as possible after the occurrence.

Cancer and the Public

Mr. A. P. BERTWISTLE (Birmingham, 28) writes: With reference to Dr. J. F. Brailsford's letter (*Journal*, October 3, p. 779), I believe that cancer propaganda among laymen would do more good than harm if expressed in an optimistic vein, and this is justified by the results of surgery, aided by modern radiology, antibiotics, and anaesthetics. I think we have come to the stage when we can say that all skin cancers, and most lip, tongue, uterine body and neck, and rectum cancers if taken early are curable by surgery and radiotherapy. I understand early malignant disease of the lip is treated as an out-patient operation in the U.S.A. How can a doctor tell a patient that he or she should have come earlier, when they know nothing of early symptoms? There is considerable propaganda regarding venereal disease—vide the walls of public conveniences. Why should not cancer propaganda be more widespread in an effort to help humanity?

Obituary

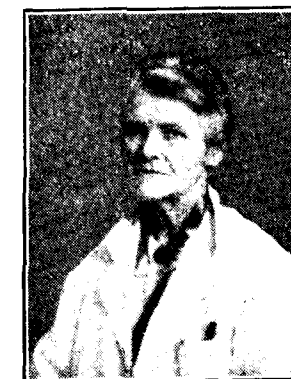
E. CHRISTINE PILLMAN WILLIAMS,
M.B.E., M.B., B.S.

Dr. Christine Pillman Williams died at her home in London on October 28 at the age of 64. She was the daughter of Mr. J. C. Pillman, a member of the Baltic Exchange, and was born on December 6, 1886, one of six children. Two of her brothers were famous players of Rugby football, and it was a special pleasure to Dr. Williams that her own four sons were all keen players.

Emma Christine Pillman went up to Girton College, Cambridge, in 1906, and took the natural sciences tripos in 1910. She qualified M.R.C.S., L.R.C.P. from the Royal Free Hospital in 1914, and obtained the London degrees of M.B., B.S. in 1916. After holding house appointments at the Royal Free Hospital until 1916, she worked at the Ministry of Munitions as chief medical officer at a shell-filling station; her war service there was recognized by the award of the M.B.E. in 1918. From 1919 to 1921 she was a member of the B.M.A.'s Ministry of Health Committee as the nominee of the Medical Women's Federation.

In 1919—the year in which she married Dr. Ulysses Williams, radiologist to the Royal Free Hospital—she returned to hospital to undertake research in the maternity wards with a Medical Research Council studentship. During her three-year tenure of this award she began, in collaboration with Dr. Lucy Wills, her work in the pathology department, which she continued on a voluntary basis until, in 1929, she was appointed lecturer in chemical pathology and chemical pathologist to the Royal Free Hospital. When war broke out again in 1939, the department of pathology was moved to the Three Counties Emergency Hospital at Arlesey, Bedfordshire, and Dr. Williams undertook full-time work there at the request of the Ministry of Health. She returned to London at the end of the war and took up her duties at the Royal Free Hospital again, being granted recognition as a teacher of the University of London in 1945, and appointed senior lecturer in charge of the department of chemical pathology in 1947. She was due to retire next year after 33 devoted years of work for her medical school and hospital. Her colleagues mourn her loss as a pathologist and as a very dear friend to many of them, and their sympathy goes out to her husband and family.

R. A. W. writes: Dr. Pillman Williams's long association with the Royal Free Hospital was temporarily interrupted on the outbreak of war in 1939, when the department of pathology was evacuated to Arlesey; she went with the first load of equipment and did not return to Gray's Inn Road until six years had passed. In the early months at Arlesey, when improvisation with makeshift apparatus was the rule, her cheerful acceptance of all difficulties and her help and encouragement in establishing teaching and hospital routine in the new and strange surroundings were invaluable.



Dr. Williams made a home for herself and her family on the outskirts of Letchworth, and there members of the staff and students were always sure of the warmest welcomes. She was soon engaged in committee and subcommittee work, in addition to her routine and teaching duties, and her advice on dietary subjects was in demand from other hospitals near by as well as from her own. Dr. Williams gave unswerving loyalty to the Three Counties Emergency Hospital, as she had always done to the Royal Free, and as she was to do again in the years that followed 1945. Nothing could daunt her indomitable spirit. To see, as we did in the severe winters of 1940 and 1941, her Balaclava helmet bobbing above the great snowdrifts as she ploughed her way to work each morning was a sight to cheer the faint-hearted. The emergency hospital in the country owes to Dr. Williams, as it does to her clinical colleague, Mrs. Chodak Gregory, a deep debt of gratitude for their faithful service to all its interests.

In reorganizing the department of chemical pathology at the Royal Free Hospital after the war Dr. Williams worked unrelentingly and did not spare herself, and she had the happiness of seeing it grow in stature and importance before her last illness took her from it. Her colleagues will miss her sorely. No one could have been kinder or more loyal. No one ever sought her help in vain.

D. C. H. writes: I first met Christine Pillman Williams in 1918, when she was in medical charge of the women in a munitions factory, which she invited me to visit with her. There she was tackling the problems of T.N.T. and allied poisonings and was winning the ready co-operation of all who worked under her by her sympathetic and understanding approach. A year or two later I was in daily contact with her at the Royal Free Hospital, where our association continued till 1937. Dr. Williams excelled as a clinical pathologist, and her help in the diagnosis of a difficult case was invaluable, for she viewed the problem as a whole and kept the clinical probabilities always in mind when advising on laboratory investigations. Anyone who had the privilege of working with her, whether as junior resident or one of the senior staff, owes her a debt of gratitude for the help she gave so readily from her funds of knowledge and experience.

Quite early in her career Dr. Williams became interested in the disorders of pregnancy and did valuable work on the biochemical changes associated with these disorders and with their dietetic treatment, and later we worked together on the dietetic treatment of rheumatoid arthritis. The effects of various diet treatments were studied from the clinical aspect with the concurrent biochemical changes, other therapeutic treatments being excluded. Some extremely interesting results were obtained and cinematograph records of clinical progress were made. The work, however, was interrupted by the outbreak of war in 1939. A modified form of Bircher-Benner diet was used in a number of cases, Dr. Williams being responsible not only for the drawing up of the diet sheets but for the close supervision of the preparation of the food in palatable form in the diet kitchen. Her biochemical research work covered many fields, but was always directed to clinical problems, to which she made many valuable contributions. Her loss will be mourned by all who knew and loved her.

N. S. FRASER, O.B.E., M.D.

The medical profession in Newfoundland has lost a prominent member by the death of Dr. N. S. Fraser at St. John's on October 6 in his ninetieth year.

Nutting Stuart Fraser was born in 1864, the youngest son of the late James Oliphant Fraser, one-time Member of the House of Assembly and a former Postmaster-General for Newfoundland, and grandson of the Rev. Donald Allan Fraser, pioneer kirk minister of the County of Pictou, Nova Scotia. After receiving his early education at the Protestant Academy in St. John's he attended Queen's University at Kingston, Ontario,

and matriculated with first-class honours in Latin and Greek. Later he entered Edinburgh University to study medicine, and graduated M.B., C.M. in 1886, in the same year passing the examination for the M.R.C.S. in London.

After graduation he held residential appointments at the Simpson Maternity Hospital and the Royal Sick Children's Hospital, Edinburgh, and then in 1887 returned to St. John's, Newfoundland, entering practice as a junior partner with the late Dr. Thomas Howley. From that time until his death he lived a life of devoted and unselfish service. In 1893 the Government of Newfoundland appointed him to the first medical board formed under the Medical Act, and he maintained his membership of the board for 60 years, being its president for the past 25 years.

In 1936 Dr. Fraser celebrated his fiftieth year in practice in a remarkable way. He wrote a thesis on some original studies, and was awarded his M.D. for this work by the University of Edinburgh. All through his professional career he kept his knowledge up to date, and as recently as September this year he took an active part in the discussions of the Newfoundland Medical Association and gave the members a short address on pancreatitis. He was a pioneer in many medical activities, including the use of x rays, and he established and maintained for many years the only children's hospital, as well as conducting a large general practice. He was a consultant on the staff of the general hospital, and for some years was port doctor and health officer for the port of St. John's. During the influenza epidemic of 1918 he was recalled to the health department, and by his strong action in closing all places of entertainment and banning mass meetings he did much to stop the spread of the infection. At the same time he organized a volunteer nursing service and temporary hospitals. In 1945 he was appointed O.B.E. for his medical work in St. John's.

Dr. Fraser was prominent in church circles and a faithful member of St. Andrew's Church as the senior elder and superintendent of the Sunday school. Numerous contributions on current topics and historical subjects were published over his initials in the local daily paper. He leaves four sons, one of whom, Dr. Nutting Stuart Fraser, is a consultant anaesthetist in Edinburgh, and another, Dr. J. Oliphant Fraser, is in general practice in St. John's.

Dr. C. E. MORRIS, a past president of the Chester and North Wales Medical Society, died at his home in Holywell, North Wales, on October 7, at the age of 81. A popular figure in the town since 1898, he had completed 50 years in practice before he retired a few years ago. Charles Edward Morris was born at Rhosllanerchrugog, near Wrexham, on May 31, 1872, and from Ruabon Grammar School he went on to study medicine at University College, Liverpool, and later at St. Mungo's College, Glasgow. He qualified in 1895 and then held a post as house-surgeon to Sir Robert Jones at the Royal Southern Hospital, Liverpool, an appointment which encouraged his keen interest in orthopaedic surgery. In 1898 he became resident surgeon at the Flintshire Dispensary, and after holding that appointment for some years he went into partnership with the late Dr. Owen Jones, of Holywell. During his professional life he was closely associated with the hospital at Holywell and often operated there. One of his main interests was obstetrics, and he was very accomplished in this work. He was surgeon to many of the industrial concerns in the area, and was often called to attend injured colliers at the coal-face. In the medico-political world he took a very prominent part. He

was secretary of the Denbigh and Flint Division of the B.M.A. from 1913 to 1917, chairman of the Division in 1924-5, president of the North Wales Branch in 1931-2, and he represented his constituency at ten Annual Representative Meetings between 1919 and 1935. He was also a former member of the Welsh Committee of the B.M.A. A member of the old Flintshire Insurance Committee for many years, he was also secretary of the local panel committee, and became a member of the Denbighshire and Flintshire Executive Council at its inception. In 1912 he saw the inauguration of the National Health Insurance scheme, of which he was a whole-hearted supporter, as he was of the National Health Service Act of 1948. His non-professional interests were many, and in particular he was a loyal member of his Church, serving on the representative body of the Church in Wales. A keen archaeologist, he was a member of the board of governors of the National Museum of Wales. At one time he was a member of the senate of University College, Bangor. Another of his interests was Freemasonry, in which he held several important offices. Dr. Morris will be greatly missed by his patients and colleagues; his kindly nature, his humility, and his versatility were only a few of his many virtues. He leaves a daughter and four sons, the eldest of whom, Dr. J. E. Ll. Morris, remains in practice at Holywell.—D. B. E.

Dr. S. B. HERD writes: When Dr. C. E. Morris, of Holywell, passed quietly on, there was extinguished a flame that had illumined with a bright steady light the medical, religious, and scientific life of Flintshire and regions further afield for many years. Charles Morris was not merely a fine general practitioner and no mean surgeon, as his long and devoted service to the Holywell Cottage Hospital showed, but a humanitarian in the very deepest and best sense of that word. He devoted his energies to the service of the people in the district, who loved him for his kindness and sympathy, as well as they admired and trusted him for his skill. He was for many years an active member of the North of England Obstetrical and Gynaecological Society, travelling long distances to attend meetings, and was always held in respect and admiration. Many will remember how he would sometimes break his usual modest silence and give a discussion with the fruits of his long clinical experience. He found time, too, for archaeological and other non-medical interests, and his perennial energy even in his later years was the envy of his juniors. Behind his jizzical and habitually semi-humorous expression there was a tranquillity and steadfastness, a serenity and quiet confidence, on which he drew to meet the trials of bereavement and illness. To those around him he was able to pass his serenity and faith.

Mr. ROBERT JAKES, who died in Worthing Hospital on September 20 at the age of 91, was, before his retirement 20 years ago, a consultant ophthalmic surgeon in Plymouth and a member of the honorary staff of the Royal Eye Infirmary. Born at Antrim, Northern Ireland, on February 28, 1862, he was educated privately and later came a medical student at King's College Hospital. He qualified in 1900 and obtained the diploma of F.R.C.S. three years later. After holding resident appointments at King's and at the Royal Eye Hospital, Southwark, he settled in practice at Plymouth as an ophthalmic surgeon. In his younger days Mr. Jakes took an active interest in medico-political affairs and was chairman of the Plymouth Division of the British Medical Association from 1911 to the end of the first world war and vice-chairman for four years thereafter. He was president of the South-western Branch of the Association in 1923-4 and a past president of the Plymouth Medical Society. A scholarly man with advanced political views, he foresaw much of the trend of medical practice as it is to-day. In 1909, for instance, he published a paper titled "Nationalization of Medicine." Colleagues of his will recall to mind his kind, whimsical disposition and his command of language as a public speaker. His death was regretted by many old friends in Plymouth.

We announce with much regret the sudden death on November 6 of Dr. JOSEPH BRAMHALL ELLISON at the age of 55. Educated at Rugby School, he saw service in the 1914-18 war in the Royal Engineers: he suffered severe shock as the result of being "buried alive" for several hours. Ellison went to Clare College, Cambridge, after the war, and thereafter to St. George's Hospital. He qualified M.R.C.S., L.R.C.P. in 1924, and took his Cambridge M.B., B.Ch. in 1925 and the M.D. in 1930, the same year in which he acquired the D.P.H. At St. George's, in the year of his qualification, he was awarded the Certificate of Honour and the Brackenbury Prize in Medicine. He was house-surgeon at St. George's and at Addenbrooke's and house-physician at the Queen's Hospital for Children. Not long after these appointments he entered the Fever Hospital Service of the Metropolitan Asylums Board, later taken over by the L.C.C. For the past twenty-five years he had worked at the same hospital—the Grove Hospital, Tooting—content to remain there in a relatively junior position. Ellison's friends and colleagues had little doubt of the brilliance of his mind and of his potentiality for achieving a more outstanding position in medicine than he did. His many gifts and a wide range of non-medical interests probably made it difficult for him to pursue with concentration any one course in life. He had a remarkable knowledge and appreciation of art, literature, and music, and he would take more pride in a poem he had written than in a paper published in one of the medical journals. At one time he embarked on the hazardous venture of promoting a film. Ellison was a stimulating and witty conversationalist, and no one could know him without feeling enriched by the experience. The guiding motive of his professional life was his unflinching affection for the sick children under his care in the fever wards of the Grove. He would prefer to spend his Christmas in the hospital so that he could entertain the children and make them laugh, and there must be in the neighbourhood of Tooting many hundreds of children who, with their parents, recall with deep affection his vivid and cheerful personality; they owe much to him. Ellison was a valued occasional contributor to the *B.M.J.*, and his knowledge of French and German was turned to good account in the work he did for *Abstracts of World Medicine*. His friends mourn the passing of a brilliant and lovable person whose character was marked with that eccentricity of personal idiom that is peculiarly English.

Universities and Colleges

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the College held on July 25 the following officers were re-elected: *President*, Mr. Arthur A. Gemmell; *Vice-presidents*, Professor G. I. Strachan, Mr. A. J. McNair; *Honorary Treasurer*, Mr. A. C. H. Bell; *Honorary Secretary*, Mr. H. G. E. Arthure; *Honorary Librarian*, Mr. A. J. McNair; *Honorary Curator of the Museum*, Mr. A. W. Bourne; *Honorary Treasurer, Canadian Regional Council*, Mr. W. R. Foote. The following officers were elected: *Honorary Treasurer, Australian Regional Council*, Mr. J. N. Chesterman; *Honorary Treasurer, New Zealand Regional Council*, Mr. J. E. Giesen.

The Bernhard Baron Research Scholarship has been awarded to Mr. Stanley Albert Way for research on problems connected with the early diagnosis of cancer in women.

The following candidate was admitted to the Membership: D. S. Burris.

The following candidates were elected to the Membership: L. J. Abramowitz, S. Alankaram, W. J. R. Anderson, G. S. Andrew, A. K. Bose, J. C. Brace, E. R. Broadberry, T. J. Buckley, S. Burke, R. K. Burt, J. G. Cameron, R. S. Casement, Po Wong Christina Chow, Maureen D. Connolly, R. L. Edwards, M. B. Flanagan, F. M. C. Forster, Kathleen M. Frith, M. C. G. Grant, P. B. Guastalla, R. H. J. Hamlin, J. W. S. Harris, C. A. Jones, R. Ll. Jones, I. R. Macdonald, Betty Mallace, G. A. Manly, D. N. Menzies, M. C. Michelow, J. Natrass, H. H. Neifeld, F. N. Neser, J. P. O'Dwyer, D. R. Patnaik, Clara Phillips, B. G. Pickles, W. Rotheram, J. S. Scott, J. M. Stewart, R. A. Struthers, Valerie M. Thompson, C. J. Thornberry, H. Ulman, C. G. Wilson.

Medical Notes in Parliament

SOCIAL SERVICE LEGISLATION IN NEW SESSION

The Queen's Speech opening the new session of Parliament on November 3, stating the Government's intentions to strengthen the national economy and thereby to safeguard the high standards of the social services, attracted diverse comment in the subsequent debates. The Speech also promised legislation to consolidate and extend the law on the safety, health, and welfare of miners and quarrymen, to provide benefit for certain further cases of disablement from industrial diseases, to amend and consolidate the law relating to food and drugs, and to restrict night working in the baking industry.

The EARL OF ROTHES, who moved the Address in the House of Lords in reply to the Queen's Speech, spoke as a governor of a London teaching hospital in expressing some disquiet about the rising cost of the Health Service. He said it had been thought that the high initial cost would tend to stabilize itself, because a better service would mean better health and a consequent reduction in demand. In practice the reverse seemed to be happening—both demand and cost had increased. It was unthinkable to try to stop the advance of medical science, so it would seem that the country must face a rising cost year by year.

Prevention of Tuberculosis

Miss EDITH PITT, an industrial welfare officer elected in July for the Edgbaston division of Birmingham, who seconded the address in the Commons, directed attention to the treatment and prevention of tuberculosis. The stage had been reached when there was an opportunity to eradicate it entirely. The number of ascertained cases awaiting hospital treatment remained the immediate problem. More beds were needed, more nurses, and improved surgical facilities. It would help to make the most effective use of existing beds if some kind of hostel or intermediate accommodation could be provided for those who only needed limited supervision and perhaps some nursing. A recent survey in the Midlands showed that between 15 and 20% of the beds occupied came within this group.

Mental Health

Mr. MALCOLM MCCORQUODALE hoped that the Royal Commission on the lunacy laws would consider closely whether there should not be a much greater separation between the problem of mental health and that of the mental defective. He would like to see mental hospitals, where the treatment was medical, and mentally ill patients remain under the Health Service; and colonies for defectives, whose treatment was a matter of care and education, returned to the local education authorities. He hoped also that the commission would not flinch from considering whether special medical treatment should be given to patients who had no control over their sexual appetites, and who were kept in institutions although in all other respects they could find a satisfactory place in society.

Mr. JAMES SIMMONS, who has worn an artificial limb since 1917, pleaded for some special consideration for the 24,000 men still surviving who had one or more limbs amputated in the first world war. They were an ageing group—the average age was 62—and they had special problems arising from the "wear and tear" from artificial limbs that should be compensated. A few years ago the Rock Carling committee was set up to inquire into the effect of amputation on the heart and lungs. Since that inquiry some limbless men—himself among them—had been personally examined. He hoped the Government would hasten the findings of the Rock Carling committee and announce their intentions for the limbless veterans.

"Smog" Masks and Research

Mr. SOMERVILLE HASTINGS asked the Minister of Health what research had been made to determine how much of

the sulphur oxides and other gaseous contents of fog were removed from inspired air by the use of a dry gauze mask.

Mr. IAIN MACLEOD, replying on November 3, stated that there has been extensive research on protection from the toxic solid and gaseous contents of air in different conditions. Respirators to achieve this had been known for many years; they were of rather elaborate canister types, something like those used in the Forces. But the real problem of the "smog" was that of persons—and particularly old persons—suffering from weaknesses of the lungs or heart, as last winter showed, and further research was needed to determine what respirators could be safely worn by such people for long periods. This was going on actively among the out-patients of a large hospital. As to surgical gauze masks and chiffon scarves, he was advised that they would be of little or no value in absorbing the toxic gases, although, like any other comparable form of improvised protection, they would impede some of the solid particles.

EARL JOWITT in the House of Lords on November 4 urged the development of smokeless fuel and the extension of the smokeless zones.

LORD WOOLTON, replying for the Government, said an interim report was due soon from the committee appointed by the Minister of Fuel and Power.

Nerve Gases

Mr. IAN WINTERBOTTOM asked on November 9 if an antidote to nerve gases had been discovered, and referred to the recent death of a volunteer during experiments. Mr. DUNCAN SANDYS, Minister of Supply, replied that no complete antidote had yet been discovered. Mr. WINTERBOTTOM asked if the Minister could explain how the categorical statement that an antidote had been found had made its way into the American press by way of the *British Medical Journal* (August 9, 1952, p. 334, article from Chemical Defence Advisory Board). Mr. SANDYS replied that what he said was that no complete antidote had been found; a partial antidote had been found, but it was not regarded as wholly satisfactory.

Prospects for Registrars

The House of Commons had a short discussion on November 6 on the employment prospects of hospital registrars.

Mr. HORACE KING, who initiated it, recalled that in 1951, when it was discovered that there were more registrars than the Health Service could absorb, the decision was made to cut the intake of registrars to the approximate number of consultant posts likely to become vacant from year to year. His concern was with the men who already, in good faith, had taken posts as registrars and now found it difficult to obtain posts of any kind.

This problem confronted a group of 300 or 400 senior registrars. He described cases in the Southampton area to illustrate the difficulty the registrar had in trying to get into general practice: a surgeon-registrar who in desperation had taken a post in Australia; another registrar who did not even get on the short list for a vacant post in general practice; and a third who had hoped to become a consultant in general medicine but who had now switched over to pathology and taken a registrar's post.

He quoted also from a letter in the *Supplement* of October 3 (p. 161), "a bitter but revealing letter," he called it, "from a doctor who gave tragic pictures of the fate of three registrars," and from an annotation (*Journal*, p. 773), which said, "There is more than a grain of truth in the jocular remark . . . that to the applicant for a general-practice vacancy the possession of a car is more important than the possession of M.R.C.O.G., F.R.C.S., or—most dangerous encumbrance—M.R.C.P." It was a parlous state of affairs, Mr. King went on, when a medical journal could poke cynical fun at academic medical qualifications. It was bad for the health of the medical profession and of the Health Service. He did not blame the Minister. Vacancies were filled in the first place by a joint committee consisting of members of the health executive and the local medical committee; the former might be laymen, the latter were

entirely members of the medical profession. The short list went to the Medical Practices Committee, a national body consisting entirely of doctors, which finally made the appointment. So if a wrong was being done by the Health Service to registrars it was being done by members of the medical profession. The B.M.A. might be a very old trade union, but it was not as loyal to all its members as some others. The solution of the problem of registrars' entry lay largely in the hands of the profession, which dominated the committee which—independent of control—filled partnership and assistant posts as they became vacant. He urged that the Minister should use what influence he could by direct instruction, by exhortations to the medical practices committee and the local joint committees and to the B.M.A., and by direct action, if necessary, to see that the older registrars got a square deal.

Dr. BARNET STROSS said that many senior registrars found difficulty in obtaining consultant posts because of the reluctance of established consultants to allow them into the field at all. Since the emergence of the Health Service, and payment for all work, consultants' incomes had increased, sometimes in a spectacular fashion. But despite this there had been a decided reluctance by established consultants, particularly in the countryside, to allow any new men to come into this sphere of work.

Miss PAT HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health, said the fact that more men went into the senior registrar grade than it was possible to absorb into consultant posts in hospitals had been the subject of negotiations with the profession, and it had now been agreed that there should be an intake of approximately 270 new senior registrars each year. The number in the early years of training was now closely in line with this plan. But the number in the later stages of training was still in excess of the vacancies available. It was not the case, as Mr. King had said, that consultants were staying on longer.

The largest problem was in the category of registrars. It was never thought that all those who took registrar posts could possibly become specialists. The development of medical treatment and of the hospital service generally had called for many more registrars, and there was a grave shortage of this classification in some areas. This problem was under close examination by the profession and the Ministry, and it was clear that the remedies must include an increase in full-time and part-time registrars.

The main complaint of Mr. King was that there was discrimination against these registrars when they attempted to get into general practice. She thought too much emphasis had been put on the advertised vacancy relating to single-handed practices. It was not surprising that preference was often given in these cases to the man who had had general-practitioner experience. The wider field was unquestionably more in partnership than in advertised vacancies. There was far greater scope for a registrar to obtain an appointment in partnership, because it was unrealistic to think that the Medical Practices Committee, assessing the ability of a doctor to take over practice single-handed, and start in a new designated area, would overlook the doctor who already had general-practice experience. Generally speaking, a registrar had the highest qualifications in other ways, but his first steps in general practice would be far more advisably taken in a partnership. Having obtained that experience, he would, with his additional qualifications, be a very strong candidate for a single practice.

Dr. STROSS said he accepted this, but was any method available by which registrars looking for posts of this kind might know where they could apply?

Miss HORNSBY-SMITH replied that it was up to the partnerships to advertise, but she would examine the extent to which, by consultation with executive councils, they might know of vacancies that were imminent. She also pointed out that competition was particularly strong in the South of England, where there had been as many as 70 applications for single-practice vacancies. In the industrial North and in Wales there had been difficulty in getting one application for a designated area.

She disagreed with Mr. King's strictures on the medical profession. It had a dominating position on executive councils and on the Medical Practices Committee. One or two letters in the *British Medical Journal* had protested against the present method, but if it were reversed there would be enough letters to fill the entire journal from people who opposed the idea that anybody other than members of the profession were qualified to judge the suitability of those who wished to take up practice. In making their selections the Medical Practices Committee and the executive councils were doing a very good job.

Medico-Legal

VIOLINIST AWARDED DAMAGES

Damages of £1,240, with costs, were awarded by Mr. Justice Havers in the Queen's Bench Division last week to Miss Julie Saumarez, aged 43, of London, who sued the Medway and Gravesend Hospital Management Committee, alleging that negligent treatment of injuries to her left hand had ruined her career as a professional violinist.

Her case was that in a fall in July, 1949, she sustained a fracture of the base of the proximal phalanx of the left thumb and a chip fracture of the base of the distal phalanx of the middle finger of the left hand. On July 15, 1949, and on several occasions thereafter, until October, 1949, she attended the Sheppey General Hospital, Kent, for treatment, the doctor treating her being Dr. J. R. Theobalds. She was satisfactorily treated for the thumb fracture, but she alleged that Dr. Theobalds failed to discover or diagnose the chip fracture to the finger. Although she complained several times about the finger, and told him that an x-ray examination at the London Hospital had revealed a chip fracture, further examination was refused. As a result the bone had set in a crooked position, making it impossible for her to play the violin properly and thus ruining her career as a professional violinist.

The hospital management committee, denying negligence, contended that examination and treatment of Miss Saumarez's injured hand were properly carried out. They denied that she ever made any complaint about an injury to her finger. They did not admit that plaintiff had sustained any injury to her finger at all, and denied that she had suffered the damage alleged.

In evidence, Miss Saumarez said that when she first went to Sheppey General Hospital she did not know the nature of her injuries. Later she complained to Dr. Theobalds several times about pain in her middle finger. She said she told Dr. Theobalds she had been to the London Hospital and had been told that she had a chip fracture of the middle finger. He told her the x-ray plates at Sheppey showed no such injury.

Mr. R. Y. Paton, surgeon, called for the plaintiff, said that when he examined her in 1951 the distal phalanx of her left middle finger had a marked deviation. He considered the accident in 1949 was the most likely explanation of the deformity. The injury could have been remedied if discovered within three weeks.

Dr. Theobalds said in evidence that when the plaintiff first came to him a thorough clinical examination revealed injury to the thumb only. He had the thumb x-rayed, and treated it. On subsequent occasions he examined only the thumb specifically, but he would have noticed any obvious injury to the finger. On no occasion did Miss Saumarez complain about her finger or say anything about an x-ray examination at the London Hospital.

Called for the defence, Mr. O. J. Vaughan-Jackson, surgeon, said he examined plaintiff's hand in 1951 and found no injury to the middle finger, although there was a deflection of the distal phalanx. He was uncertain whether this had been caused by the phalanx. He was uncertain whether the deflection should have been examined, or whether it was a pre-existing abnormality. Cross-examination, he agreed that the deflection should have been obvious on examination unless masked by swelling. He also agreed that either a deflection or a swelling ought to have been investigated further, although an x-ray examination might not have been necessary.

The Judgment

In his reserved judgment Mr. Justice Havers said it was not disputed that plaintiff now had a fairly obvious deflec-

tion of the distal phalanx of the left middle finger. The dispute was whether it was congenital or due to the accident. Another matter not disputed was that Miss Saumarez had her left hand x-rayed at the London Hospital on August 30, 1949. Here the dispute was why she went there, what the x-ray film showed, and whether she told Dr. Theobalds about it.

His lordship found that Miss Saumarez did suffer a chip fracture of the distal phalanx of the left middle finger in the fall in July, 1949, and that she complained about it to Dr. Theobalds. He accepted plaintiff's evidence that the reason why she went to the London Hospital for an x-ray examination was because she was worried about the condition of her finger.

He found that the injury was such that Dr. Theobalds should have discovered it on his first examination, or later. If he had discovered it, his duty would have been to make a further clinical and x-ray examination. It was even more incumbent upon him to make further inquiries if, as his lordship found, Miss Saumarez complained of injury to the finger. For these reasons his lordship held that Dr. Theobalds was lacking in that standard of care which he owed to a patient. The medical evidence was that, if properly treated, there was a good chance of such an injury being completely cured.

On the question of damages, the judge said he was driven to the conclusion that Miss Saumarez's career as a soloist or as a leader or deputy leader of an orchestra had come to an end before the accident. He thought the damage to her career as a result of the negligence of Dr. Theobalds was very slight. He assessed general damages at £900 and special damages at £340, and entered judgment, with costs, for the plaintiff for £1,240.

Vital Statistics

Week Ending October 31

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,226, whooping-cough 2,067, diphtheria 18, measles 842, dysentery 394, paratyphoid fever 8, and typhoid fever 4.

Poliomyelitis notifications (uncorrected) were as follows: paralytic, 88 (89); non-paralytic, 34 (46); total, 122 (135). This is a decrease of 13 compared with the previous week, the figures for which are in parentheses.

Infectious Diseases

Infectious diseases were more prevalent in England and Wales during the week ending October 24. Rises in the number of notifications included 207 for scarlet fever, from 1,062 to 1,269; 119 for measles, from 742 to 861; 94 for whooping-cough, from 2,096 to 2,190; and 78 for dysentery, from 232 to 310.

Only small rises were recorded in the local returns of scarlet fever; the largest was 35 in Yorkshire West Riding, from 155 to 190. The increase in the incidence of measles was due to the experience of the northern section of the country; in the southern section a small decrease was reported. The largest increase in measles was 67 in Lancashire, from 183 to 250. 29 cases of diphtheria were notified during the week, 9 more than in the preceding week. The largest rise was from 0 to 7 in Staffordshire. The chief centres of diphtheria were Lancashire, Liverpool C.B. 6; Staffordshire, Brownhills U.D. 4; Berkshire, Abingdon R.D. 3. Only small fluctuations were recorded in the local trends of whooping-cough. 9 of the 17 cases of paratyphoid fever were notified in Surrey, Merton and Morden U.D.

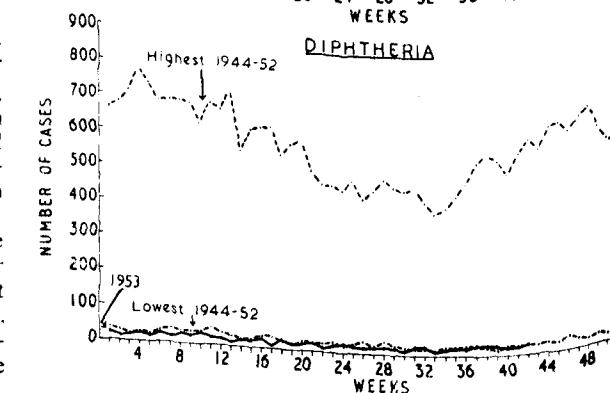
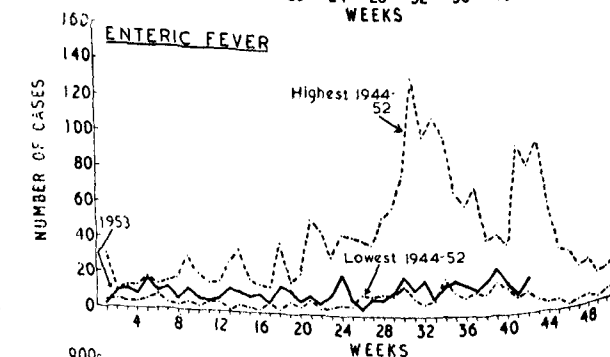
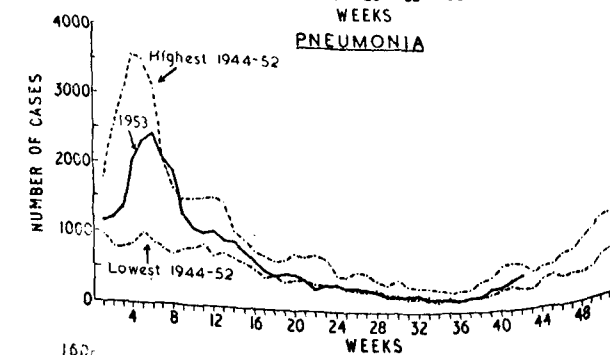
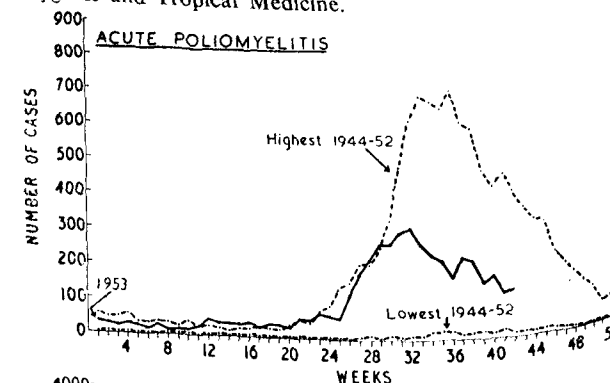
135 cases of acute poliomyelitis were notified during the week. These were 8 more for paralytic and 1 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding (Spenborough U.D. 3), Lancashire 13 (Liverpool C.B. 3, Preston C.B. 3), Nottinghamshire 10 (Nottingham C.B. 5), London 9, Warwickshire

9 (Birmingham C.B. 5), Southampton 7, Glamorganshire 7, and Kent 7 (Deal M.B. 4).

The chief centres of dysentery were London 66 (Islington 16, Chelsea 13), Yorkshire West Riding 40 (Bradford C.B. 14, Sheffield C.B. 11), Lancashire 37 (Royton U.D. 10), Yorkshire North Riding 28 (Middlesbrough C.B. 28), Kent 23 (Royal Tunbridge Wells M.B. 19), Gloucestershire 18 (Gloucester C.B. 9, Bristol C.B. 7), Northumberland 15 (Gosforth U.D. 6), and Middlesex 15 (Edmonton M.B. 7).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus -----. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Medical News

B.C.G. for School-leavers.—The Ministry of Health and the Department of Health for Scotland have written to tell local authorities that approval will be given to schemes for offering B.C.G. vaccination to children before they leave school. This is on the understanding that such schemes do not prejudice existing arrangements for the vaccination of tuberculosis contacts. Most children will be vaccinated in their 13th year, so that they can be followed up afterwards for a year at school. Children of 15 years and over are to be excluded so as not to interfere with the Medical Research Council's current trial of B.C.G. in school-leavers. The Ministry of Health states that there is as yet no scientific evidence of the true value of B.C.G. vaccination, and recognizes that some authorities may prefer to wait until the results of the M.R.C. trial are available in three years' time before themselves launching new vaccination schemes.

A New Journal.—*Radiation Research*, a journal devoted to all phases of radiation research, is to commence publication in February, 1954. Its object is to promote the integration of physics, chemistry, biology, and medical research, in so far as they are concerned with the effects of radiation on matter. The term "radiation" is interpreted broadly to include ionizing, ultra-violet, infra-red, and visible radiation. The journal will appear bi-monthly under the editorship of Dr. Titus C. Evans, University of Iowa, and be the official organ of the Radiation Research Society. The publishers are the Academic Press, 125, East 23rd Street, New York, 10.

Copley Medal.—Professor A. J. Kluyver, professor of microbiology at the Technical University, Delft, has been awarded the Copley medal of the Royal Society for his fundamental contributions to that science.

Nichols Fellowship.—The Council of the Royal Society of Medicine invites applications for a grant of £225 per annum for research in the fields of obstetrics and gynaecology. The award will be made for a period of one year in the first instance, but may be extended for a second year. Further details may be obtained from the Secretary, Royal Society of Medicine, 1, Wimpole Street, London, W.1. Applications must be received by May 15, 1954.

Leukaemia Award.—The Robert Roesler de Villiers Award was conferred on Dr. Ludwik Gross at the New York Academy of Medicine last month for his contributions to the knowledge of the nature and cause of leukaemia.

British Cardiac Society.—The autumn meeting of the British Cardiac Society was held in London on October 30 under the chairmanship of Sir John Parkinson. Both the morning and afternoon sessions were devoted to short communications arranged by Dr. Samuel Oram, the secretary of the society. They included papers on sodium chloride and cardiac muscle, pulmonary distensibility and respiratory work in mitral stenosis, cardiac output during exercise studied by the Fick method (illustrated by a film), pulmonary venous drainage into the right heart via a persistent left superior vena cava entering the left innominate vein, and the ballistogram in coronary artery disease. A dinner was held at Simpson's Restaurant.

Conference of Army Pathologists.—The 7th annual conference of Army pathologists was held at the Royal Army Medical College, Millbank, on October 22 and 23. The first morning was devoted to technical demonstrations arranged by the professor of pathology at the College, and in the afternoon there was an administrative meeting in the War Office. On the second day there were lectures by civilian guest lecturers. The annual dinner was held at the Junior United Services Club.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending October 24 (No. 42) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
diphtheria ..	29	4	1	1	0	29	1	16	1	1
dysentery ..	310	66	176	2	1	181	15	102	6	0
pharyngitis, acute ..	10	0	0	0		2	2	1	0	
scarlet fever: pharyngeal ..	3	2	2	0	1	6	2	2	1	
paratyphoid ..	17	0	1	0	1	15	0	1 (B)	0	
typhoid ..	199	27		2		114	9		0	
acute enteritis or diarrhoea under 5 years ..				25	32				13	20
measles* ..	861	19	37	19	43	7,785	964	129	61	12
scarlet fever ..	34	1	14	0	2	30	0	12	1	1
thalassaemia neonatorum ..	32	6	6	0	1	29	5	9	0	
pneumonia† ..	475	31	146	9		439	23	224	1	
poliomyelitis, acute: paralytic ..	89	6	3	25	12	86	2	5	4	0
non-paralytic ..	46	3			5	33	5			
epidemic fever§ ..	236	37	12	3	1	254	26	16	0	
typhoid fever ..	1,269	81	237	30	69	1,760	171	331	26	61
tuberculosis: Respiratory ..			157	30				135	21	
Non-respiratory ..			27	3				22	8	
whooping-cough ..	2,190	130	251	43	34	1,074	63	111	35	33

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
diphtheria ..	1	0	0	0	0	1	0	1	0	0
dysentery ..	0	0	0	0		0	0		0	
encephalitis, acute ..					0					
enteric fever ..	0	0	0	0		0	0		0	
infective enteritis or diarrhoea under 2 years ..	7	1	0	1	1	7	0	1	0	1
influenza ..	11	0	2	0	0	11	1	1	0	0
measles ..	0	0	0	0		0			0	
scarlet fever ..			1	2						
pneumonia ..	180	32	28	8	6	173	25		16	7
poliomyelitis, acute ..	4	0			0	2	0			
scarlet fever ..		0	0	0	0		0		0	
tuberculosis: Respiratory ..	117	13	11	2	11	104	9	19	4	6
Non-respiratory ..		0	2	0	2		1	1	0	3
whooping-cough ..	1	1	2	0	0		0		0	0
Deaths 0-1 year ..	204	23	36	9	7	176	16	25	11	9
Deaths (excluding stillbirths) ..	5,000	745	555	86	154	4,951	702	556	133	169
LIVE BIRTHS ..	7,157	1047	857	205	382	7,323	1029	920	220	392
STILLBIRTHS ..	175	22	24			209	23	20		

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

White. — On October 7, 1953, at 31, Union Street, Oldham, Lancs, Adam Crawford White, M.D., aged 84.

Henderson and Haggard also classify hydrogen sulphide as an irritant gas, especially at the low concentrations which may be expected to be produced by industrial effluents.

The gas may be detected by smell at about 3 p.p.m., but detection by odour should not be relied upon, as the olfactory nerve endings are readily paralysed by this gas. 20 p.p.m. should be regarded as the maximum allowable concentration for continuous exposure during the working day, to avoid conjunctival and other irritation. Exposures to 200-300 p.p.m. for up to four hours may produce nausea, belching, cough, headache, and dizziness, as well as irritation of the conjunctivae and blistering of the lips. Concentrations above 600 p.p.m. may produce death after upwards of 15 minutes' exposure and at 1,000 p.p.m. death may be instantaneous (Hamilton and Hardy). Henderson and Haggard write that moderately high concentrations may cause death from cessation of breathing owing to undue reduction of the CO₂ in the blood from overbreathing; very high concentrations cause respiratory paralysis. The hydrogen sulphide is rapidly oxidized in the blood, and once the symptoms of acute intoxication have passed off there should be no systemic sequelae.

Flat Foot

Q.—(1) Is there a hereditary predisposition to flat foot? (2) At what age can the condition first be reliably diagnosed? (3) What prophylactic measures—for example, exercises or alteration to the shoes—are recommended for early cases, and at what age should they be begun?

A.—(1) The evidence for a hereditary predisposition to flat foot is extremely vague. In general terms, it is probably not an inherited condition. However, it would seem likely that certain races are more predisposed than others.

(2) The ordinary child's foot appears flat because the arch is obscured by subcutaneous fat, and it is not until this disappears that an accurate diagnosis can be made. The time of this disappearance varies considerably in individuals, but certainly 18 months to 2 years may be regarded as the earliest age at which the diagnosis of flat foot can be accurately made.

(3) The wearing of good shoes, by which is meant shoes which are broad and well made, would seem to be the only prophylactic measure available. The part played by the muscles in the maintenance of the arch is disputed, but it seems unlikely that the performance of special exercises on a few occasions in a week can have much benefit, as the child is, in any case, actively using all these muscles all day long in his play. Not only is it doubtful whether these methods are of benefit as a prophylactic measure, but the use of exercises and wedges in the treatment of early cases is also of questionable value. The difficulty in flat foot is that there are no objective standards by which we may measure the severity of the condition, or improvement obtained by treatment, and at present a sceptical attitude to these measures is probably justified, but this is a matter of opinion, as there are few ascertained facts.

Clamping the Umbilical Cord

Q.—For some time now I have refrained from clamping or ligating the maternal end of the umbilical cord on the grounds that this aids separation of the placenta. This practice was recently challenged. What is your expert's view? Of course, I ligate the maternal end of the cord when dealing with a multiple pregnancy.

A.—This is an idea which most obstetricians have heard of from one of their earlier teachers, but it is rarely mentioned in modern textbooks. An exception is Stoeckel's *Lehrbuch der Geburtshilfe* (1930 and 1941 editions). In the past, however, it was a popular subject of dispute. In early times it was probably the general practice not to tie the maternal end of the cord, but during the seventeenth and eighteenth centuries certain European obstetricians advocated clamping it—some because they found that the turgid placenta after delivery was easier to demonstrate to students, some because they considered that the practice stimulated the

uterus to expel the placenta more expeditiously. Smellie preferred to leave the cord untied, believing that its smaller bulk could pass more easily through the cervix, but he mentions the contrary arguments (vol. 1, p. 230, of the New Sydenham Society Edition of Smellie's *Treatise on the Theory and Practice of Midwifery*). The matter was never proved one way or the other and gradually ceased to attract interest, as it became clear that it had no practical importance. During more recent years a closely related subject which has received attention is the suggestion that overdistension of the placenta with saline injected through the cord (Mojon-Gabastou's method) facilitates separation and delivery of the "retained" placenta—again an idea which is not universally accepted.

In the routine management of labour the baby should not be separated from its mother until the cord has ceased pulsating, and in these circumstances the maternal end of the cord bleeds very little even if left untied. Moreover, by the time pulsation has ceased the placenta should already have separated. The conclusion, therefore, is that so far as the progress of the third stage is concerned it makes no difference whether the maternal end of the cord is tied or not. Clamping it merely prevents a little unnecessary soiling of the bed linen.

Ringworm of the Feet as an Industrial Injury

Q.—Ringworm of the feet is fairly common among miners, particularly where pit-head baths are used. Should such cases be regarded as of industrial origin—for example, as a compensatable variety of dermatitis?

A.—To obtain benefit under the Industrial Injuries Act an occupational dermatitis must be "produced by dust, liquid, or vapour." This designation is usually regarded as not covering infective conditions. In certain cases, however, where bathing after work is considered to be essential (for example, in coal-miners) infection from this fungus may be regarded as an "injury by accident" and benefit paid accordingly.

Trypsin Therapy

Q.—What are the indications for trypsin therapy? How should it be given?

A.—Trypsin therapy may be indicated when the pancreas has sustained severe damage as in chronic pancreatitis. In these circumstances it is possible that enteric-coated tablets of pancreatin (B.P.) may be beneficial. Recently trypsin has been given by inhalation in cases of bronchiectasis, as the enzyme is able to liquefy viscid secretions, but this application is still experimental and not without danger.

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

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LONDON SATURDAY NOVEMBER 28 1953

CLINICAL TRIALS OF INFLUENZA VACCINE A PROGRESS REPORT TO THE MEDICAL RESEARCH COUNCIL BY ITS COMMITTEE* ON CLINICAL TRIALS OF INFLUENZA VACCINE

In November, 1951, the Medical Research Council set up a Committee on Clinical Trials of Influenza Vaccine. This report deals with the studies made by the Committee in the winters of 1951-2 and 1952-3.

Small-scale Serological Trials in the Winter of 1951-2

The Committee at its first meeting in December, 1951, decided that, as an epidemic of influenza A was unlikely to develop during the winter of 1951-2, small-scale trials should be organized with the following objects:

(i) To assess by serological methods the comparative value as antigens of vaccines prepared from certain selected virus strains. These were chosen as being representative of the influenza A viruses recovered during the epidemic of influenza in 1950-1.

(ii) To determine the occurrence, severity, and duration of local and general reactions to these vaccines.

(iii) To study the reported illnesses occurring in the inoculated persons, together with symptoms and diagnoses.

(iv) To investigate methods of recording observations to ensure that the documentation in large-scale field trials would be as efficient as possible.

These objects were chosen because the experience of previous field trials had indicated the great importance of choice of virus strain in the vaccine, the need to avoid clinical reactions, and the desirability of assessment of the value of the vaccine by a method wholly free from bias. It was considered that, despite the obvious difficulties of clinical diagnosis, an influenza vaccine which gave useful protection should yield a reduction in clinical illness. Therefore, provided that laboratory tests in the country as a whole indicated the widespread prevalence of influenza virus A infection during a certain period of time, the assumption could be made that a high proportion of the illnesses diagnosed as influenza in controls and vaccinated persons during the same time were probably due to influenza A.

In view of the changes in antigenic structure of epidemic strains of influenza A which had attacked this country since 1946 the following vaccines were selected for trial.

Vaccine A: Made from a virus strain isolated in the Liverpool epidemic of 1951 in threefold concentration expressed in terms of the titre of original allantoic fluid.

Vaccine B: As in A, but in tenfold concentration.

Vaccine C: Prepared from a strain of virus isolated in the Swedish outbreak of late 1950 in threefold concentration.

Vaccine D: As in C, but in tenfold concentration.

These vaccines and those referred to below were prepared by Dr. F. Himmelweit at the Wright-Fleming

*Members of the Committee: Professor C. H. Stuart-Harris (chairman), Dr. C. H. Andrewes, Dr. W. H. Bradley, Sir Alexander Fleming, Professor A. Bradford Hill, Dr. F. Himmelweit, Dr. F. O. MacCallum, Dr. J. C. McDonald, Surgeon Captain J. G. Maguire, Major-General A. Sachs, Professor Wilson Smith, Wing Commander G. H. Stuart, Dr. I. N. Sutherland, Brigadier A. E. Richmond (secretary).

Institute of Microbiology, St. Mary's Hospital, London, by adsorbing the virus from formalized (1:10,000 formaldehyde) allantoic fluids on to aluminium phosphate, followed by washing and resuspending of the deposits in neutral phosphate buffer solution to which merthiolate had been added to a final concentration of 1:10,000. The final preparations contained per dose (1 ml.) 10 mg. of aluminium phosphate and in vaccine A 19,200, vaccine B 64,000, vaccine C 12,000, and vaccine D 40,000 haemagglutinating units, as assessed by the "plastic plate" method (W.H.O., 1953) in use at the World Influenza Centre.

For the trial of the vaccines, volunteers were invited from university students, and from hospital nursing staffs in the four metropolitan hospital regions. Some 1,200 volunteers in 11 universities and 30 hospitals thus obtained were at each centre inoculated with the vaccines in serial order, so that approximately equal numbers in each centre received one of the four vaccines. At the time of inoculation each volunteer gave a blood sample for serological examination. A second sample was taken a fortnight later.

The serological investigations were carried out at the World Influenza Centre, Mill Hill, and in the bacteriological departments of Edinburgh and Liverpool Universities, the department of medicine of Sheffield University, and nine selected laboratories of the Public Health Laboratory Service. Haemagglutination inhibition tests were made using formalized egg antigens prepared from viruses homologous with those used in the actual vaccines. The sera were not treated with cholera filtrate before the tests to destroy non-specific inhibitors. A statistical summary of the serological results is shown in Table I.

TABLE I.—Comparison of Increase in Antibodies With the Various Vaccines

Vaccine	No. of Volunteers	Agglutination Inhibiting Antibodies			
		Geometric Mean Titre		Rise in Mean Titre (Ratio 2nd to 1st Serum)	
		1st Serum	2nd Serum		
Liverpool strain	A—threefold B—tenfold	294 294	53.0 38.5	168.1 188.0	3.2 4.9
Swedish strain	C—threefold D—tenfold	294 285	104.7 98.4	300.8 372.9	2.9 3.8

The following conclusions were drawn from these trials: (a) A slightly greater antibody response was produced by the vaccines made from the Liverpool (1951) virus. (b) Any advantage of the tenfold concentration in each case was so slight as not to justify the expense and other disadvantages of its use. (c) There was no appreciable difference in the number and severity of reactions produced by the vaccines under trial. (d) In a population similar to that under trial and at the same season of the year, about one in three might expect to have respiratory illness of some kind in the

eight weeks following inoculation. A large number of such illnesses would be ordinary (afebrile) common colds.

Field Trials in the Winter of 1952-3

As an outbreak of influenza A in the winter of 1952-3 seemed probable it was decided that field trials of a pilot nature should be carried out using a selected and a control vaccine. The arrangements made for these trials were as follows.

General Organization

(i) *The Main Trial.*—The main trial was organized in 128 volunteer centres throughout England and Wales, Scotland, and Northern Ireland. These centres were in industrial communities of various kinds (factories, etc.), universities, hospitals, and the fighting Services (Table II). Industrial concerns tended a little to concentration in the North of England, but other centres were scattered more evenly. In all 12,710 volunteers took part.

(ii) *A Subsidiary Trial in Scottish Villages.*—This was carried out in villages scattered along the route from Stornoway to the Butt of Lewis in the Hebrides, with a later extension to Carloway. Volunteers in alternate villages were inoculated with the influenza vaccine, and those in the other villages with the control vaccine. The original intention was that the inoculations should be carried out by the practitioners in their surgeries and at home visits, but it was found necessary to arrange evening sessions in local schools in addition. The programme of inoculations began in late November and was continued into the latter part of December. Although the response to the call for volunteers was not as good as was hoped, helpful information would have been obtained if influenza had developed, but in fact no influenza occurred.

(iii) *A Special Trial at Vauxhall Motors Ltd., Luton.*—The primary object of this investigation was to gain experience of a trial method in which special means were taken to ensure as accurate a diagnosis of influenza as possible. These comprised an overall supervision by one single observer and a more extensive use of laboratory methods. The 455 volunteers who took part are included in the numbers given in (1) above. Results from the more general point of view are included below with those of the main trial. A detailed report of this investigation is to be published separately.

Vaccines

The trial vaccine (X) was polyvalent with equal proportions of a threefold concentration of F.M.1 originally recovered in 1947 in the U.S.A. and of the egg-adapted Liverpool strain (1951). Each dose of 1 ml. contained 9,600 haemagglutinating units of F.M.1 and 12,000 such units of the Liverpool (1951) strain adsorbed on to 10 mg. of aluminium phosphate.

The control vaccine (Y) was a bacterial "anti-influenza" vaccine of low potency, which contained, per 1 ml., 12.5 million *H. influenzae*, 25 million pneumococci, and 2.5 million streptococci, in addition to 10 mg. of aluminium phosphate and merthiolate to a final concentration of 1:10,000.

TABLE II.—Participants in the Main Trial

Type of Centre	No. of Centres	No. of Volunteers		Total
		Trial Vaccine	Control Vaccine	
Industrial (factory workers, etc.)	36	3,560	3,555	7,115
Hospital (nurses)	59	1,131	1,163	2,294
Universities (students)	13	346	355	701
Services (Army and Royal Air Force personnel)	20	1,303	1,297	2,600
Total	128	6,340	6,370	12,710

Procedure in the Main Trial

Inoculations.—The vaccines were given by deep subcutaneous injection into the left upper arm. Almost all inoculations were given between November 26 and Decem-

ber 5, the few exceptions being completed by December 12. It was hoped that this timing would permit the development of immunization before the expected outbreak of influenza.

Inoculation Registers.—An inoculation register was prepared for each volunteer centre which gave in consecutive order: (a) the code letter and serial number to be allotted to the person inoculated; (b) the vaccine (X or Y) to be used for each person; (c) a blank space for the name and initials of the volunteer. Separate registers were used for males and females. The sequences in which the two vaccines were to be used were based on random sampling numbers and varied in each register, so that, although in each centre approximately equal numbers of volunteers received the trial vaccine and the control, it was not by simple alternation of the two vaccines. It was essential that the vaccine given was strictly in accordance with the registers, and special instructions were issued on this point. It was imperative that those responsible for the subsequent follow-up should not know which vaccine the volunteers had received. All registers were therefore returned to the secretary of the Committee as soon as the inoculations had been completed; no copy of the register was allowed, and no record of the vaccine given was kept on the volunteer's personal record card.

The Follow-up.—Volunteers were questioned about reactions 48 hours after inoculation and then kept under observation until March 31, 1953. A personal record card for each volunteer was kept by the supervising medical officer of each centre. On this form were recorded details of reactions and dates of all absences from work due to illness of two working days or more. For each such absence of an inoculated volunteer in a hospital, university, or Service group the medical officer listed the symptoms complained of and gave his opinion of the diagnosis. In industrial centres each volunteer was given an additional illness record card, which he was asked to present to his general practitioner should he be ill. On it the practitioner was asked to fill in the symptoms and diagnosis of the illness. On completion it could be sent by the practitioner direct to the industrial medical officer concerned or could be handed to the patient for delivery when he returned to work. If this form was not completed by the general practitioner, the industrial medical officer made a retrospective diagnosis by questioning the patient. The personal record card and the illness record card are shown in full in the Appendix. At the end of the trial period the personal record cards were returned for analysis by the Medical Research Council's Statistical Research Unit at the London School of Hygiene and Tropical Medicine, who were also in possession of the inoculation registers.

Reactions to Inoculation.—Local and general reactions were recorded by their severity in four groups: (a) nil; (b) slight and insufficient to interfere with normal activities; (c) moderate and interfering with normal activity; and (d)

TABLE III.—Percentages of Volunteers Experiencing Various Degrees of Reaction

Severity of Reaction	Local Reactions		General Reactions	
	Trial Vaccine	Control Vaccine	Trial Vaccine	Control Vaccine
Nil or slight	97.3%	95.9%	98.2%	97.6%
Moderate	2.6%	3.9%	1.2%	1.9%
Severe	0.1%	0.2%	0.5%	0.5%

severe and causing absence from work. There was considerable variation in the assessment of nil reactions. The proportion of local reactions so described ranged from 2% to 100% of volunteers in the Service group, and from 4% to 85% in industry. Similarly the general reaction rate described as nil varied from 48% to 100% in the Service group and from 65% to 99% in industry. The nil and slight categories have therefore been combined in Table III. Reactions were if anything slightly less severe among those who had been given the trial vaccine than among those given the control. With both vaccines females suffered more than males.

The Influenza Epidemic of the Winter 1952-3

The rise in the number of deaths from influenza in the great towns of England and Wales and the increase in claims upon the Ministry of National Insurance indicated that influenza was prevalent in Britain during the first quarter of 1953. The first laboratory evidence of influenza virus A infection was obtained from single isolations of virus from Kent on December 8, 1952, and from Surrey on December 30, 1952; subsequent tests confirmed that the epidemic which followed was due to the same virus. Weekly totals of positive tests for influenza A in the laboratories of the Public Health Laboratory Service confirm that influenza A was prevalent during the first 10 weeks of 1953. The rise in influenza mortality in 160 great towns in this period indicated the same. Analysis of laboratory results by geographical regions suggests that the peak of the epidemic was reached earlier in the south and east than in the north and west. While the trial was in progress about 5% of all cases of influenza diagnosed serologically by the Public Health Laboratory Service were due to influenza virus B. The strains of influenza virus A recovered during the epidemic and which were examined in detail at the World Influenza Centre, London, were reported as being antigenically related to but not identical with those recovered in 1951 (personal communication from Dr. C. H. Andrewes).

Laboratory confirmation of the presence of influenza among volunteers was not planned, but evidence of influenza virus A infection was in fact obtained from volunteers in four out of eight centres from which material for laboratory examination was collected. Specimens from uninoculated persons were tested and found positive in 8 of a further 12 centres. In addition, at least one case of influenza A was confirmed in 33 of the 41 counties of the United Kingdom in which there were trial centres. It seems probable, therefore, that many of the volunteers would have incurred some exposure to the risk of infection with influenza A between one and three months after inoculation.

Results of the Main Trial

It was unfortunate, so far as this trial was concerned, that the incidence of influenza A was comparatively slight. The disease was also largely confined to Southern England, and in those areas in which it occurred it did not invariably spread. As a result there was no evidence of influenza in volunteers in more than one quarter of the centres, while in the remainder the incidence was low.

A summary of the sickness experience of volunteers is given in Table IV.

TABLE IV.—Absences Due to Illness in Vaccine and Control Groups

Diagnosis	Trial Vaccine (6,340)		Control Vaccine (6,370)		Difference between Percentages and Standard Error of Difference
	No. of Attacks	% Attacked	No. of Attacks	% Attacked	
Influenza	192	3.0	309	4.9	1.9 ± 0.34
Febrile cold	218	3.4	242	3.8	0.4 ± 0.33
Febrile sore throat	86	1.4	86	1.4	0.0 ± 0.20
Other respiratory diseases	131	2.1	145	2.3	0.2 ± 0.26
Non-respiratory diseases	253	4.0	208	3.3	-0.7 ± 0.33
Total	880	13.9	990	15.5	1.6 ± 0.65

It may be seen that the difference between the influenza attack rates in the two groups, 1.9 ± 0.34 , was statistically significant, while the differences in incidence of febrile cold, febrile sore throat, and other respiratory diseases were not significant. The volunteers who received the trial vaccine had more absences due to non-respiratory diseases than those who received the control vaccine. Though the difference is just significant statistically, it may have been due to chance or there may be some other explanation. It is clear, however, that the absence rate due to all causes is still significantly less in the volunteers who received the trial vaccine.

TABLE V.—Influenza Attack Rate by Type of Centre Vaccine and Sex

	Males		Females	
	Trial Vaccine (X)	Control Vaccine (Y)	Trial Vaccine (X)	Control Vaccine (Y)
Industry:				
No. exposed to risk	2,820	2,816	740	739
No. of attacks	94	147	29	53
Percentage attack rate	3.30	5.22	3.92	7.17
Difference (X-Y)	-1.92 ± 0.54			
Services:				
No. exposed to risk	1,169	1,162	134	135
No. of attacks	25	31	2	9
Percentage attack rate	2.14	2.67	1.49	6.67
Difference (X-Y)	-0.53 ± 0.63			
Hospitals:				
No. exposed to risk	100	94	1,031	1,069
No. of attacks	3	8	27	44
Percentage attack rate	3.00	8.51	2.62	4.12
Difference (X-Y)	-5.51 ± 3.32			
Universities:				
No. exposed to risk	249	257	97	98
No. of attacks	7	15	5	2
Percentage attack rate	2.81	5.84	5.15	2.04
Difference (X-Y)	-3.03 ± 1.81			

A more detailed analysis of the absences ascribed to influenza in male and female volunteers in the main trial groups is shown in Table V.

In seven of the eight comparisons the influenza attack rate was lower in the trial vaccine group, though it was only in the industrial group that the difference was statistically significant. In the remaining groups the differences were too small to be significant on the numbers concerned. In the female university students the influenza attack rate was higher in those given the trial vaccine, but the numbers at risk were small and the total absences due to influenza were only 7. Of the cases of influenza in the industrial group, 78.5% were diagnosed by general practitioners whose co-operation in the trial was both essential and unstinted.

Regional Differences.—From the available national records of influenza mortality in the great towns the intensity of the influenza outbreak varied from south to north. It was thought of interest, therefore, to compare the results in the trial from the areas with a high incidence in their large towns with those from areas with medium and with low incidences. Deaths per 100,000 of the large town populations in the first quarter were found, and Wales, the northern region, and the north-west region, with rates of 8.1 or less, were taken as areas of low incidence, and London and the south-eastern counties, the eastern, south-western, and the southern regions, with rates of 16.2 or more, were taken as areas of high incidence. Those with rates between 8.1 and 16.2 were regarded as areas of medium incidence. The results obtained are shown in Table VI. It will be noted

TABLE VI.—Influenza Attack Rates in Different Areas of England and Wales

	Trial Vaccine (X)		Control Vaccine (Y)		(X-Y) Differences
	No. Exposed	% Attacked	No. Exposed	% Attacked	
Areas of low influenza incidence	2,160	2.92	2,194	3.60	-0.68 ± 0.5
Areas of medium influenza incidence	2,992	2.81	2,995	5.08	-2.27 ± 0.5
Areas of high influenza incidence	1,188	3.79	1,181	6.61	-2.82 ± 0.9

that while in each group of areas the influenza attack rate in those receiving the control vaccine exceeded the rate in those given the trial vaccine, the difference grew more pronounced as the incidence of influenza increased (as estimated from mortality data).

Seasonal Differences.—An examination was made of the weekly absence rates on account of influenza, febrile cold, febrile sore throat, and other illnesses, in the trial and control groups from the week ending December 29, 1952, to that ending March 30, 1953. No table is given, as the information added nothing material to that already obtained and the length of time since inoculation did not appear to be a factor determining the differences between the trial and control groups already mentioned.

Discussion

A full recapitulation of the various publications dealing with the results of trials on influenza virus vaccines in man is deemed unnecessary in this report because excellent reviews have appeared recently—for example, Frances (1953). Previous trials of influenza vaccine have ended sometimes with results of an equivocal character either because of the low incidence of influenza experienced both in control groups and in those given vaccine or because of a lack of identity between the virus strains incorporated in the vaccine and the viruses causing the outbreak. This latter reason may have been responsible for the failure of the vaccine to exert protection in the previous large-scale trial in this country in 1947 (Mellanby *et al.*, 1948) and in America in the same year. It will be recalled that these failures followed upon the successful use of vaccine in diminishing the incidence of influenza A in the American trial in 1943 (U.S. Commission on Influenza, 1944). Thus, doubt has existed concerning the value of a vaccine against the strains of influenza virus A which have been encountered in epidemics in all parts of the world since 1947 and whose antigens have deviated widely from those of viruses encountered before 1946. Trials carried out in the U.S.A. recently (Meiklejohn *et al.*, 1952) provided evidence that if the vaccine contains virus strains with antigens resembling the viruses causing the outbreak some protection is conferred by immunization. In these American trials the diagnosis of influenza in controls and immunized men was based upon the serological tests rather than on clinical findings, because of the well-known difficulty of clinical diagnosis, particularly in Service establishments.

The present report indicates that major consideration was given by the Committee to the problem of the particular virus strain to be used in the vaccine and also to the method of assessment of illness in those taking part in field trials. The small-scale trials carried out in the winter of 1951-2 were designed partly to test methods of recording likely to be used in a large-scale trial and partly to give evidence of the relative potency in stimulating antibodies of two antigenically distinct virus A strains similar to strains recovered during the 1950-1 epidemics in Europe (Isaacs, Gledhill, and Andrewes, 1952). The vaccine used in the large-scale trial in the winter of 1952-3 contained two chosen strains—one the Liverpool 1951 strain, and the other a strain originally isolated in 1947 (F.M.1) which had been used in the American trial already mentioned (Meiklejohn *et al.*, 1952).

The vaccines used in both winters were essentially similar to those employed in previous British and American trials but differed in their low content of non-specific protein. The purification was achieved by the use of aluminium phosphate, which adsorbs selectively many influenza viruses from infected allantoic fluids (F. Himmelweit, details to be published elsewhere). Its retention in the final preparation has the added advantage of retarding the rate of absorption of the vaccine from the site of inoculation. The decision to use aluminium-phosphate-adsorbed vaccines was based upon the experience of other workers (Appleby *et al.*, 1951) that a low rate of both local and general reactions could be anticipated with this type of preparation.

The decision to rely upon clinical methods for the diagnosis of illness in inoculated persons during the follow-up period was made after consideration of the practical difficulties which exist in obtaining blood and garglings at a sufficiently early stage of illness in those living at home or in lodgings. Moreover, doubt exists concerning the validity of some of the serological methods commonly used for the diagnosis of influenza in individuals who have previously been immunized with influenza virus antigens. Some evidence in confirmation of this difficulty was obtained in the subsidiary trial carried out at Luton. Thus, although there is undoubted difficulty in arriving at a diagnosis of influenza on purely clinical grounds, this method was chosen as the main method of assessment in the large-scale trial. The alternative diagnoses of "febrile sore throat" and "febrile cold" were suggested for illnesses of the respiratory tract

which might be confused with influenza but which are endemic in the population during the winter season. Illnesses which caused an absence from work of less than two days were excluded from the records in order to avoid inclusion of common colds.

The evidence obtained in the laboratory that influenza virus A was actually causing infection in the groups of persons taking part in the 1952-3 trial, though indirect, was nevertheless regarded as valid. The differences found between the several categories of clinical illness in the two groups of inoculated individuals who took part in this trial were slight, but provided definite evidence of a protective action by the virus vaccine. For, if the latter had been without effect, it is difficult to understand why there should have been a difference in the number of illnesses clinically diagnosed as influenza, particularly when the recorded cases of febrile colds and febrile sore throats were so similar in number in the control and virus vaccine groups. The reduction of influenza attacks in those receiving the virus vaccine is therefore believed to be real. The figures set out in Table VI may indicate that one reason for the relatively slight protective effects was the generally low incidence of influenza in both groups: protection was apparently greater in areas of high influenza mortality than in those where it was low. It is important to stress the fact that the clinical workers and those who recorded the illnesses had no knowledge of the particular type of vaccine received by an individual. The recording of the clinical illness during the follow-up was blindfold. The results obtained are not explicable on the basis of a bias for or against the use of the term influenza for illnesses in individuals in any particular category.

Summary

Small-scale trials in the winter of 1951-2 allowed of the assessment by serological methods of the comparative value as antigens of certain influenza A vaccines.

Large-scale controlled field trials of an influenza A vaccine were carried out in 128 centres in the winter of 1952-3. This vaccine contained equal proportions of a three-fold concentration of F.M.1 (U.S.A. 1947 strain) and of the Liverpool (1951) strain. There were in addition subsidiary trials in villages in the Hebrides and in the Vauxhall works at Luton.

In the main trial there was an attack rate of clinical influenza of 3% in 6,340 volunteers in the trial vaccine group and of 4.9% in the control group of 6,370 volunteers. This is equivalent to a 40% reduction in influenza in the former group as compared with the control. Other acute respiratory conditions occurred equally often in vaccinated and control groups.

Information was also obtained about the extent and degree to which reactions occurred in the inoculated, and about other matters of interest, details of which are reported.

No outbreaks of influenza developed in the Hebrides. No results were therefore forthcoming.

The trial at Luton, of which the main object was to gain experience of special methods of ensuring accurate diagnosis, is to be reported on separately.

Acknowledgments

The Committee wishes to acknowledge the support and co-operation it has received from many sources, and without which little could have been achieved. It is very grateful to all those in industries and in the hospitals, universities, fighting Services, and elsewhere, throughout the United Kingdom who volunteered for inoculation in the earlier serological tests or in the later field trials. It is most grateful to those in the various volunteer centres who so kindly went to much trouble to collect volunteers to make the necessary local arrangements for the trials, and to shoulder the various responsibilities involved in the trials. The help of the Public Health Laboratory Service was invaluable, particularly of

its Central Laboratory at Colindale, and the laboratories at Cambridge, Manchester, Bradford, Nottingham, Newcastle-upon-Tyne, Cardiff, Exeter, Hull, and Winchester. The fullest assistance on the serological side was forthcoming also from the departments of bacteriology at Edinburgh and Liverpool Universities and from the medical department of Sheffield University. The laboratory of the World Influenza Centre at the National Institute for Medical Research at Mill Hill, including especially Dr. A. Isaacs of that laboratory, gave considerable help with the more technical aspects of the problems involved.

The Committee is deeply appreciative of the help afforded by Dr. W. J. Martin, of the M.R.C. Statistical Research Unit at the London School of Hygiene and Tropical Medicine, who spared no effort to assist in the organization of the trials and the analysis of the results.

The Committee would finally express its gratitude to the Wright-Fleming Institute of Microbiology at St. Mary's Hospital, where under the direction of Dr. F. Himmelweit the vaccines for the trials were produced, and where many of the preliminary investigations essential to their large-scale production were carried out.

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APPENDIX

Record of all absences from work or duty due to illness and lasting 2 days or more

	1st absence	2nd absence	3rd absence	4th absence
Date of onset of illness				
Date of first absence from work or duty				
Number of days in bed				
Date of return to work or duty				
Symptoms (under each heading grade as nil, slight, moderate, or severe)				
Shivering				
Sweating				
Headache				
Muscular pains				
Sore throat				
Running nose				
Prostration				
Pyrexia (state yes or no, and if yes give maximum temperature observed or reliably reported) ..				
Any other specially marked symptoms				
Final diagnosis (state yes against appropriate heading)				
Febrile cold				
Febrile sore throat				
Influenza				
Other illness (to be specified) ..				

P.T.O.

FORM A

Serial Number
of Volunteer

MEDICAL RESEARCH COUNCIL

TRIALS OF INFLUENZA VACCINES

PERSONAL RECORD CARD

Name of Inoculation Centre

Name and Initials of Volunteer

Regimental No. and Rank (Services only)

Age last birthday

Sex

Date of Inoculation

REACTIONS TO INOCULATION:

(Put a cross against appropriate answers)

(a) Nil.	Local	(a) Nil.	General
(b) Slight and insufficient to interfere with normal use of arm.		(b) Slight and insufficient to interfere with normal activities.	
(c) Moderate and interfering with normal use of arm.		(c) Moderate and interfering with normal activities.	
(d) Severe causing absence from work.		(d) Severe causing absence from work.	

Date of observation

FORM B

MEDICAL RESEARCH COUNCIL

TRIALS OF INFLUENZA VACCINES

ILLNESS RECORD CARD

The holder of this card (Full name)
has been inoculated in the trials of influenza vaccines now being conducted by a special Committee of the Medical Research Council.

In the event of any illness occurring within three months after inoculation and which confines the holder to bed, he/she has been asked to call in his/her usual medical attendant and to present this card.

The Committee would be very grateful if you, the medical attendant, would give on the back of this card a few particulars of the patient's present illness, paying special attention to the diagnosis.

On completion the card should be placed in the envelope supplied.

On returning to work the patient will report with it to the industrial medical officer who is supervising the trial on behalf of the Committee. If you prefer, the card may be posted to the test centre named on the envelope.

Any further information required can be obtained from this centre.

PARTICULARS OF ILLNESS

Symptoms (underline appropriate answer for each symptom)

Shivering	none	slight	moderate	severe
Sweating	none	slight	moderate	severe
Headache	none	slight	moderate	severe
Muscular pains	none	slight	moderate	severe
Sore throat	none	slight	moderate	severe
Running nose	none	slight	moderate	severe
Prostration	none	slight	moderate	severe
Pyrexia	yes	no	not known	

If present, maximum temperature observed
or reliably reported

Any other specially marked symptoms

Final diagnosis (underline appropriate answer)

Febrile cold
Febrile sore throat
Influenza

Other illness

Date Signed

LABORATORY EVIDENCE OF INFLUENZA IN ENGLAND AND WALES DURING THE WINTER OF 1952-3

A REPORT FROM THE PUBLIC HEALTH LABORATORY SERVICE*

During the winter of 1952-3 an intensive effort was made to confirm the presence of influenza virus infections in as many parts of England and Wales as possible. The aims were to obtain early evidence of the presence and types of infecting viruses as part of the scheme for "Winter Epidemics" described in the Monthly Bulletins of the Ministry of Health and the Public Health Laboratory Service for December, 1951, and November, 1952, and to provide a representative number of virus strains for the antigenic and epidemiological studies of the World Health Organization, World Influenza Centre.

The complement fixation test with influenza A and B "soluble" antigens was used for the serological tests, and only fourfold or greater increases in antibody between suitably spaced pairs of serum specimens were considered significant. Virus isolations were made by amniotic inoculation of fertile hens' eggs.

The specimens were received from many sources, of which the most important were medical officers of health and general-practitioner "spotters," who provided material from cases of uncomplicated influenza under the winter epidemics scheme. Service medical officers provided similar material, and pathologists, Service and civilian, submitted specimens mainly from cases of pneumonia in which a virus aetiology was suspected. In addition, information was exchanged with Captain J. E. Stauch, of the U.S. Air Force Laboratory in London (494th Clinical Laboratory).

Laboratory Evidence

Influenza A.—The first evidence of the presence of influenza A infection was the isolation of virus from the post-mortem specimen of lung obtained from a patient dead with pneumonia in North-west Kent in the second week of December. Shortly afterwards infection with influenza A was confirmed in an outbreak of respiratory disease amongst the residents of a nurses' home in North Surrey. This outbreak began in the second and third weeks of December, and continued till the end of the month. During the last week of December civilian and R.A.F. cases of influenza A were confirmed in Somerset (Taunton area), Army cases in Surrey (Camberley), and cases were reported by the U.S.A.F. laboratory from units in Oxfordshire, Gloucestershire, and Bedfordshire. At the end of the first week of January positive tests were obtained from Naval personnel in Devon (Plymouth), from Army personnel in Nottinghamshire (Chilwell), from R.A.F. personnel in Buckinghamshire (Halton), and from civilians in Surrey (Epsom), Sussex (Eastbourne), Lancashire (Manchester), and Bedfordshire (Bedford).

During the second week of January further cases were confirmed in the southern areas, and cases were detected in a Service unit in Yorkshire (Middlesbrough), from R.A.F. units in Essex, Norfolk, and Suffolk, and from civilians in

*Serological and virus isolation tests were undertaken at the Virus Reference Laboratory, Colindale (Drs. B. E. Andrews, G. B. Bruce White, and J. C. N. Westwood), and at the Northampton Laboratory (Drs. L. Hoyle and A. J. Beale). Serological tests were undertaken at the following laboratories: Exeter (Drs. B. Moore and E. M. Mackay Scollay), Manchester (Dr. M. O. Adams), Winchester (Dr. R. D. Mackenzie), Cardiff (Dr. A. D. Evans), Nottingham (Dr. G. B. Ludlam), Cambridge (Dr. P. J. Wormald), Hull (Dr. J. McCoy), and Newcastle-upon-Tyne (Dr. C. R. Peck).

Cambridgeshire (Cambridge) and Suffolk (Ipswich). At the end of the second week cases were first reported in Wales (Cardiff).

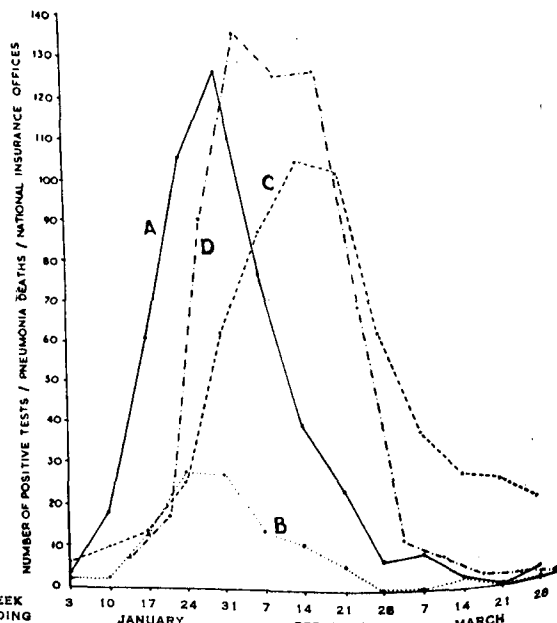
In the third week of January cases were detected in all parts of the country, and in Tables I and II positive tests obtained between January and June, 1953, are shown classified by the week in which specimens were collected, and the Registrar-General's geographical regions of England and Wales.

Influenza B.—A small number of cases of influenza B were detected. Weekly and regional totals of positive laboratory tests are included in the margins of Tables I and II.

Influenza A

Timing of the Epidemic

The first cases of influenza A were detected in mid-December, but no marked increase in the weekly totals of positive tests was observed till the second week of January. During the remainder of January the number of cases detected rose and the peak of positive serological tests occurred in the week ending January 31. In February the numbers decreased rapidly. A small number of cases were detected in March and only one in April. More than 50% of sera were positive between the weeks ending January 17 and February 7, and so it is concluded that the peak of the



Weekly totals of positive laboratory tests, deaths from influenza pneumonia, and the number of local offices of the Ministry of National Insurance which received excess notifications of sickness (A = Influenza A, positive serological tests; B = Influenza B, virus isolations; C = Influenza pneumonia deaths in 160 great towns; D = Number of Ministry offices which received an excess of sickness notifications (reduced to one-fifth true vertical scale). D = Number of Ministry offices which received an excess of sickness notifications (reduced to half true vertical scale).

influenza A epidemic occurred between these dates and most probably during the last week of January. However, since in some areas specimens were not submitted after the presence of infection had been established it seemed desirable to check this conclusion by other means. The Registrar-General's weekly returns for deaths from influenza pneumonia in the 160 great towns provide an index of the progress of an epidemic (Logan, 1951), and these figures, together with the weekly totals of positive laboratory tests are shown in the Chart. The numbers of sickness benefit claims (from all causes) received at the Ministry of National Insurance and Pensions have also been shown to provide a basis for assessing the progress of an epidemic (Masse, 1951). Figures showing the numbers of local offices of the Ministry which received claims in excess of 225% of the for November, 1952, were available, and these are also shown as weekly totals in the Chart. (It should be noted that

TABLE I.—Cases of Influenza Confirmed by Serological Tests*

TABLE 1.—Cases of Influenza in 1918-19																													
Week Ending:	January					February				March				April			May			June		Totals							
	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30	7	14	20	Influenza A	Influenza B	Negative	
Cases of influenza A in regions:																													
I. Northern				1	5	2				9	6	4	2														31	0	6
II. E. and W. Ridings, Yorks					2	12				6	1	1	1														24	2	97
III. North Midland				1	4	23				6	8	4															47	0	34
IV. Eastern				14	20	13				19	6		2														74	5	86
V. London and South-eastern				5	35	22				13	7	2															92	22	226
VI. Southern				30	13	23				4	3	4															75	6	72
VII. South-western				16	11					2	3																43	2	65
VIII. Wales				2	2					4	2		2														14	3	52
IX. Midland				1	6	8				11	5	3															35	0	31
X. North-western				7	10	4	12			3	2	6															44	1	55
All regions:																											479		
Influenza A	3	18	61	107	128					77	40	24	7															41	
Influenza B				1	1	3				3	2	2																	
Negative tests	19	29	49	66	112					63	45	74	38																
													</																

* For cases in December, 1952, see text.

TABLE II.—Cases of Influenza Confirmed by Virus Isolation*

TABLE II.—Cases of Influenza Complicated by Pneumonia																												
Week Ending:	January					February				March				April				May				June		Totals				
	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30	7	14	20	Influenza A	Influenza B	Negative
Virus A isolations in regions:																												
I. Northern					5			1	2	2																10		33
II. E. and W. Ridings, Yorks					1				1	1																3		12
III. North Midland				3	3			3	3																	12		60
IV. Eastern				1	4	10	3	1	1																	20		123
V. London and South-eastern				2	1	6	3	2	1	1		2														19	2	164
VI. Southern					2	2	4																			11		77
VII. South-western					5	2	5			1	1															9	1	53
VIII. Wales					2	2		6	1																	6		12
IX. Midland						4	1	1	1																	5	1	46
X. North-western				1†		1	1	1	1	1																106		25
All regions:																												
Influenza A	2	2	13	28	28			14	11	6			2														4	
" B								3	2	2			1															
Negative	9	10	68	147	142			59	76	54	10		5	10		4		1		3		1	5		1			605

* For cases in December, 1952, see text. † Virus isolated by Dr. J. O'H. Tobin, Department of Bacteriology, University of Manchester.

the vertical scales of the curves in the Chart have been adjusted to emphasize their time relations, and actual numbers, except in the case of laboratory results, cannot be read direct from the printed scale.) Bearing in mind the relatively small number of cases of influenza B detected by laboratory tests, it seems reasonable to conclude that influenza virus A infection was associated with a large proportion of the illnesses and fatal cases of influenza pneumonia which, as shown by the curves of the Chart, occurred in the last week of January and during February. The figures for positive laboratory tests began to rise and reached their peak about one week earlier than those for the excess sickness benefit claims, and about two weeks before those for the pneumonia deaths. These differences in time would be accounted for respectively by the interval between the onset of illness and the presentation of sickness benefit claims at the offices of the Ministry of National Insurance, and by the interval between the onset of influenza and the pneumonia which subsequently led to death. It is assumed that most of the pneumonias were of the post-influenza type rather than the fulminating acute type sometimes observed during an influenza epidemic.

Thus there seems to be substantial agreement between estimation of the time limits for the epidemic arrived at by each of the three methods; and the conclusion reached from the evidence provided by the laboratory findings—namely, that the peak of the epidemic occurred in the last week of January—appears to be reasonably accurate.

One of the aims of this investigation was the early detection of influenza, and since the first cases were confirmed four to six weeks before the disease became widespread this object appears to have been satisfactorily achieved.

Geographical Spread of Infection

Influenza virus A infections were first detected in South-east England in mid-December, in the South around the

New Year, and in the South-west and Midlands towards the end of the first week of January; whilst in Wales, East Anglia, and the North cases were not confirmed till the second week of January. These observations and the figures quoted in Tables I and II suggest that the epidemic spread northwards from the South-east and South of England. This hypothesis is in general supported by an (unpublished) regional analysis of the numbers of local offices of the Ministry of National Insurance and Pensions which received excess claims for sickness benefit.

The material varied widely between areas, and in some areas lack of evidence for influenza may have been due to failure to submit specimens for examination. For example, several instances occurred where no material had been submitted from an area and positive results were obtained only after urgent requests for material had been made to the authorities concerned; and, in retrospect, it appeared likely that infection had been present in the area for many days. In some areas, also, the first specimens were not received till after the peak of sickness notifications to National Insurance offices. Clinical criteria for the diagnosis of influenza appear to vary between regions, and introduce a further source of error. It was noticed that material sent in response to a request from one authority tended to be collected immediately after the date when a notice on the subject was received by local medical officers, and also that this notice often reached the doctors in the South earlier than those in the North, so that analysis of material from this source may not have given a reliable estimate of the rate of spread of infection through the country. The proportions of material received from Service, civilian practitioners, and hospital sources varied widely between regions, again making it difficult to compare results. Therefore, whilst the figures suggest the direction and rate of spread of the epidemic, they do not provide evidence from which hard-and-fast conclusions can be drawn.

Influenza B

The total of cases of influenza B detected was small, and the figures shown in Tables I and II do not suggest that infection was widespread in any particular part of the country. Evidence of infection was obtained mainly from the South; no cases were detected in the Northern and North Midland areas, but this may be due to the relatively small numbers of specimens from these areas.

The most striking features shown by the figures are the absence of any peak and the observation of positive results throughout a period of almost eight months. Whereas in the case of influenza A there was a sharp peak, and although a much greater number of cases were detected, all the positive results occurred in a period of four months. It is interesting to notice also that cases of influenza B have been detected in three of the last four years.

Virus Isolations

Distribution and Antigenic Groups of the Virus Strains Isolated

Most of the above discussion is based on serological results. In all, 106 strains of influenza virus A were isolated, and the figures arranged by weeks and regions in Table II give a similar picture to those for sera in Table I. The aim was to provide a representative selection of strains from the various regions and at different stages of the epidemic. Several strains were obtained in each of the Registrar-General's regions, and the 106 isolations represent 62 different localities. The interval between first and last strains isolated was 13 weeks, and in most regions four or five weeks elapsed between the first and last isolations, so that it may be fairly claimed that the aims mentioned above were achieved.

In 1951 two antigenic groups of influenza A were present in the country, and exact information regarding their distribution was rather scanty. During the past winter, virus isolations were undertaken on a relatively large scale so that in the event of more than one antigenic group being present adequate material would be available for epidemiological studies. Strains of influenza viruses sent from the Public Health Laboratory Service laboratories to the World Influenza Centre have all, with one exception, been closely related to, but not identical with, the Scandinavian group strains isolated in England in 1951. The exception was one of several strains isolated from patients in the Ipswich (Suffolk) area, and was related to the Liverpool group strains, which were also present in England in 1951. A second strain of this group was isolated at the World Influenza Centre, London, from a member of their staff.

Strains of the 1953 Scandinavian group were also found this year in Japan, the U.S.A., and Western Europe, and Liverpool group strains were isolated in Paris, Switzerland, and Portugal.

Included in the figures for virus isolations were 28 specimens of lung obtained *post mortem*. Two strains each of influenza A and B were recovered from these specimens, and it is interesting to note that both the A strains were from patients in the London area who had died suddenly during the fogs of December and January respectively. Twelve other specimens of lung from patients in the same area whose death was also believed to be associated with fog were negative in virus isolation tests.

Summary

The laboratory evidence for influenza virus infections in England and Wales during the winter of 1952-3 is presented and analysed according to regions and the date of collection of specimens.

The first cases of influenza A were detected in mid-December, and the disease became epidemic at the end of January—that is, four to six weeks after the first evidence of infection was obtained.

In the country as a whole there was close agreement between estimates of the time limits of the epidemic derived from the laboratory results, the Registrar-General's weekly returns for deaths from influenzal pneumonia, and increased claims for sickness benefit received by local offices of the Ministry of National Insurance and Pensions.

The evidence suggests that the influenza A epidemic spread northwards from the south-east and south.

A few cases of influenza B infection were detected during most weeks between mid-January and mid-May, and occasional cases were detected up till August.

106 strains of influenza virus A were isolated, and these were well distributed with regard to time and place.

Information regarding the antigenic groups of influenza virus A was kindly supplied by Dr. A. Isaacs, of the World Influenza Centre, London. Figures for deaths from influenzal pneumonia are quoted from the Registrar-General's weekly returns, published in the *British Medical Journal*. The figures for local offices of the Ministry of National Insurance and Pensions were calculated from data made available by and quoted with the kind permission of Dr. A. Massey, Chief Medical Officer of the Ministry of National Insurance and Pensions.

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CENTENARY OF HYPODERMIC INJECTION

BY

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Hypodermic, or subcutaneous, injection of drugs being now so catholic, it is surprising to find that of all the common current methods of exhibition this is one of the most recently introduced. Inhalation, rectal administration, and even intravenous infusion were in use when Dr. Alexander Wood, of Edinburgh, gave the first subcutaneous injection, in the modern sense, one hundred years ago. As the present year is the centenary of that injection it may be of timely interest to recall the origins of the method and something of its author.

The modern hollow hypodermic needle and its companion, the syringe, have evolved from earlier and cruder predecessors made when man first began to inject drugs intravenously and to practise blood transfusion. So perhaps the common origin of these procedures is the best point to begin a consideration of the development of hypodermic injection.

The First Blood Transfusion

Although the ancient Egyptians may have practised it the first really successful blood transfusion was not performed until the middle of the seventeenth century. The story of the rejuvenation of Aeson by Medea (Ovid 43 B.C.) is interpreted by some as an indication that the notorious sorceress was acquainted with the method and that therefore the early Greeks knew of blood transfusion. However, Ovid's description of the rejuvenation simply establishes Medea as an ear-pharmacologist rather than as the deviser of blood transfusion. It is difficult to be sure whether she should be regarded as the first to inject drugs into the human body, for there were no eye-witnesses—except Liber-

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of the operation, which is reputed to have been done by cutting Aeson's throat and pouring "the juices," prepared from various plants and animals, into his veins. Again, it is often stated that the first transfusion was carried out on Pope Innocent VIII (1432-92); but, as Keynes (1949) has pointed out, the papal elixir was simply a draught prepared by a Jewish physician from the blood of three boys who were bled to death for the purpose—at least, they died soon after the bleeding.

Precisely when blood transfusion came into existence is still a matter of dispute, but it is certain that transfusion was preceded by infusion. The earliest attempts at intravenous injection were made in England in the middle of the seventeenth century and were soon followed by infusion of blood into animals and then into man.

Intravenous Injection

In 1657 Christopher Wren—while he was Savilian Professor of Astronomy at Oxford and before he became famous as an architect—conducted numerous experiments, with the assistance of Robert Boyle and a Dr.

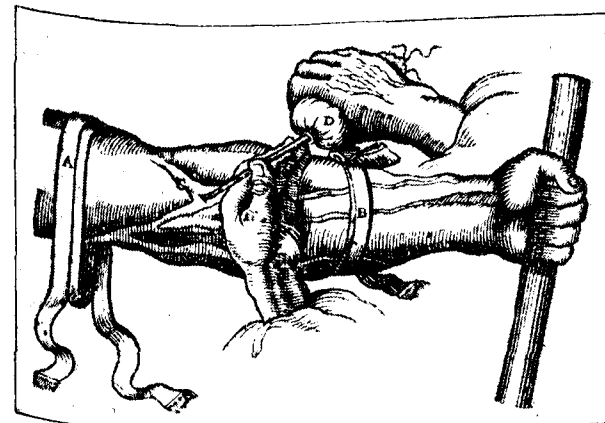


FIG. 1.—Engraving from page 2 of Major's *Chirurgia Infusoria*. Kiloni, 1667, showing his injection apparatus. (Photograph of engraving kindly supplied by Mr. W. J. Bishop, of the Wellcome Historical Medical Library.)

Wilkins, on the giving of drugs by intravenous injection (Oldenburg, 1665). Bishop Sprat (1702) said of Wren: "He was the first Author of the Noble Anatomical Experiment of Injecting Liquors into the Veins of Animals. . . . By this operation divers Creatures were immediately purg'd, vomited, intoxicated, kill'd, or reviv'd, according to the quality of the liquor injected: Hence arose many new Experiments [*sic*], and chiefly that of Transfusing Blood, which the Society has prosecuted in sundry Instances, that will probably end in extraordinary Success."

Wren appears to have been the first to perform an intravenous injection in man in, it is thought, 1657 (Clarck, 1668). During the injection the victim—a delinquent servant of a foreign ambassador—fainted and the experiment had to be stopped. Boyle (1664) described this experiment in a way which suggested that the foreign ambassador had performed the injection, but Clarck made it quite clear that it was Wren who did it in the house of the Duc de Bourdeaux, the French Ambassador. A few years later, in 1662, J. D. Major also performed some successful intravenous injections in man (Major, 1664).

For these early injections both of blood and of drugs, a quill, later replaced by a silver or gold tube—the "pipe"—was inserted into the vein and the injection made through it, either by using a small bladder—"like

a clyster"—as a pump or by means of a gravity feed. The first injections were chiefly of water, opium, and purging medicines. Intravenous administration of jalap resins, as practised for example by Fabritius (1667), was particularly popular, especially in the treatment of syphilis.

The frequent use of opium led to the early observation that it stupefied dogs and excited cats (Boyle, 1664). But opium and narcotics were by no means the only substances injected intravenously. Fortescue-Brickdale (1904) quoted Purmann (1706) as giving a list of drugs sometimes used. It includes amber, arsenic, cinnamon, oil of sulphur, snail water, spiritus lilior convallarium, spiritus nitrosi vel vitrioli, and spiritus salis ammoniaci.

With only impure drugs and crude apparatus available, the method of intravenous infusion soon fell into disrepute, and for the remainder of the seventeenth century was carried out but sporadically. Very little more was published on the subject until near the end of the eighteenth century, when there was a temporary revival of interest, which continued well into the next century. During this period Magendie was one of those most actively interested: he attempted to treat hydrophobia with injections of opium, or sometimes even warm water (Olmsted, 1944). But little success attended him, and again, except for saline infusion, the practice seems to have been little used until later in the same century, when there was a further revival of interest about 1870. It was not, however, until the irrepressible Ehrlich showed that intravenous administration of his arsenical compounds really was a practical procedure that it became commonplace in therapeutics.

The Work of Pravaz

While the practice of intravenous injection of drugs waxed and waned in the nineteenth century a special type of intravascular administration was described. Its originator was Dr. Charles-Gabriel Pravaz (or Pravas), of the Veterinary College in Lyons, France. His method was presented to the Academy of Sciences in Paris on January 10, 1853, by M. Lallemand, a director of the College. It was published in the correspondence section of the Academy's proceedings under the title "Sur un nouveau moyen d'opérer la coagulation du sang dans les artères, applicable à la guérison des aneurismes." Pravaz injected iron perchloride "au maximum de concentration" into the vessels of sheep and horses through "un trois-quarts très-fin or ou en platine" introduced obliquely by "une espèce de mouvement de vrille." "A ce trois-quarts se trouve ajustée une seringue dont le piston doit être à pas de vis, afin que l'injection s'opère sans secousses et que la quantité de liquide injecté puisse être mesurée avec précision."

Pravaz suggested that the method might be modified to render it suitable for the treatment of aneurysms in human beings, and calculated that the injection could be made, with time allowed for clot formation, in about four to five minutes. As he designed and caused a syringe to be made for this work, the erroneous claim, such as that of Fluck (1953), is sometimes advanced that Pravaz was responsible for introducing hypodermic injections: but of this more anon. (Experiments on the coagulation of the blood had been carried out long before the time of Pravaz. For example, Bishop Sprat, in his *History of the Royal Society of London* (p. 199) says that the Society received a communication telling "of making the blood Florid with Volatil and coagulating with Acid Salts." Presumably he was referring to the work of Fracassati, who, in a communication to the Royal Society in 1667, described such experiments on dogs. Robert Boyle (1667) performed similar investigations on shed blood, and claimed that it was from these experiments that Fracassati got his ideas.)

Shortly before the work of Pravaz, in a period which coincided with the isolation of the first pure alkaloids from some of the crude drugs used earlier for intravenous injection, a new technique of administering medicinal agents had been evolved. In it the drugs were not given direct into the circulation, but were placed beneath the skin, from which site they gradually found their way into the system. And even prior to this, drugs had been administered through the skin, by the application of ointments and liniments to the epidermis, sometimes accompanied by vigorous rubbing. These methods were not very satisfactory, and neither was their extension—the direct application of drugs to the dermis, following the removal of the epidermis by blistering agents or caustics. Another method, more closely resembling the modern subcutaneous one, was described in 1836 by Lafargue in France. He smeared drug, in the form of paste, on the tip of a vaccination lancet, which was then pushed through the skin, where it remained for a short time before withdrawal. However, as the dose was obviously not determinable, and the method laborious and time-consuming, it never became popular.

Rynd's Method

From Dublin, in its heyday as a medical centre while Graves, Stokes, Adams, and Corrigan were leaders of the profession, there came a different approach to the problem of finding a more generally applicable and safer parenteral route of administration than the intravenous. Francis Rynd, surgeon to the Meath Hospital, devised a form of subcutaneous administration of drugs which has a slight claim to be the forerunner of the modern hypodermic method (Rynd, 1845). Under the title "Neuralgia—Introduction of Fluid to the Nerve," he described how, on June 3, 1844, "a solution of fifteen grains of acetate of morphia, dissolved in one drachm of creosote, was introduced to the supra-orbital nerve and along the course of the temporal, malar, and buccal nerves by four punctures of an instrument made for the purpose." He found that the pain of the neuralgia was abolished very rapidly, and that the patient, an elderly lady, had a better sleep the following night than she had had for months.

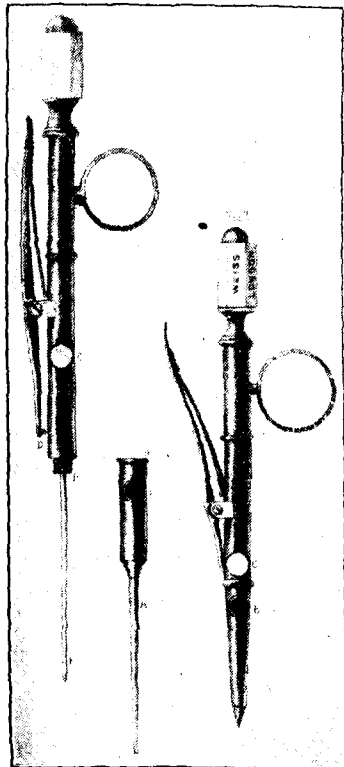


FIG. 2.—The apparatus used by Rynd (from *Dublin Quart. J. med. Sci.*, 1861, 32, 13).

He also described the case of a man aged 28, who seems to have had sciatica, successfully treated by a similar technique, although the concentration of morphia was reduced by a third. Rynd did not describe the instrument in this paper and quoted no references. It was not until a good deal later that he published an article giving details of his apparatus (Rynd, 1861), which was essentially a trocar and cannula. After insertion through the skin the trocar was made to spring back out of the cannula into the body of the instrument by pressure on the lever at the side (Fig. 2). The drug solution was then poured in through a small hole near the base of the cannula and allowed to gravitate into the subcutaneous tissues.

In 1845 a claim was made by Arthur Guinness that on reading Rynd's article he was reminded that "it had been my intention long since to have sent you an account of some cases treated by me during last summer in a similar manner. . . . I used a common lancet armed with morphia, mixed in a little water, about the consistence of a paste and operated precisely as is done in vaccinating an infant; I did not use creosote with it. . . . In another bad case of neuralgia I determined on using creosote without morphia. . . . It was of decided benefit in my case." This technique described by Guinness was not new, for it had been employed eight years earlier by M. Lafargue, and in any case it was not the ancestor of the present-day practice of hypodermic injection.

Although Rynd's method of administering fluids has been held by some to be the beginning of modern hypodermic injection (Macht, 1916; Pfender, 1911) it is extremely hard to make a really good case for this. Rynd did employ a hollow cannula, which could be regarded as a forerunner of the hollow hypodermic needle, but he depended upon gravity to force the drug solution into the tissues. Further, he was interested only in the local pain-relieving properties of his injections and did not seem to realize that effects remote from the site of injection might be obtained. This is all the more surprising when the doses are known: "The fluid I have found most beneficial is a solution of morphia in creosote [*sic*], ten grains of the former to one drachm of the latter; six drops of this solution contain one grain of morphia, and a grain or two or more may be introduced in cases of sciatica at one operation" (Rynd, 1861). As the syringe is now an essential component of the hypodermic apparatus, Rynd's instrument was most definitely not a direct forerunner of the modern equipment.

Introduction of the Hypodermic Method

It was in 1853 that hypodermic injection as we know it to-day came into being, although the first public pronouncement about the method was postponed until 1855. In 1853 Dr. Alexander Wood, of Edinburgh, instituted the practice of injecting drug solutions through the skin, using a syringe and needle. The idea of subcutaneous administration came to him while considering a development of the special type of injection introduced by Pravaz for the treatment of aneurysm. Thus, subcutaneous injection really grew out of earlier intravascular practice. Wood wrote: "Having occasion, however, about the end of 1853, to endeavour to remove a naevus by injection with the acid solution of perchloride of iron, I procured one of the elegant little syringes, constructed for this purpose by Mr. Ferguson of Giltspur Street, London. While using this instrument for the naevus, it occurred to me that it might supply the means of bringing some narcotic to bear more directly than I had hitherto been able to accomplish on the affected nerve in neuralgia. I resolved to make the attempt, and did not long lack the opportunity."

An elderly lady who had suffered for a long time from cervico-brachial neuralgia—and who, incidentally, could not take opium in any form by mouth without being violently sick—was the patient who afforded Wood his desired chance. "Accordingly, on November 28th, I visited her at 10 p.m. to give the opiate the benefit of the night. . . . I inserted the syringe within the angle formed by the clavicle and acromion, and injected twenty drops of a solution of muriate of morphia, of a strength about double that of the official preparation."

Wood (1855) published this description of the first hypodermic injection in the modern sense under the title "New Method of Treating Neuralgia by the direct application of Opiates to the Painful Points." To the twenty-sixth Annual Meeting of the B.M.A., held in Edinburgh in July 1858, he stated that the solution injected was "made of morphia in sherry wine, because I thought it would not irritate and smart so much as alcohol, and because it would not rust the instrument as a water solution of opium would do" (Wood, 1858). (Incidentally in this address Wood

that his first injection was given in November, 1843, not 1853, and Howard-Jones (1947) doubted that this was a genuine mistake. If accepted it would, of course, give Wood's method priority over that of Rynd.)

Wood injected a solution "of a strength about double that of the official preparation." Whether there was any difference between the official and official preparations is not certain. This was in the days when the colleges issued their own pharmacopoeias, and it is more than likely that Wood used the then current Edinburgh issue of 1841. In it the Morphiae Muriatis Solutio is prepared by dissolving 3 iss muriate of morphia in a mixture of 5 fluid ounces of rectified spirit and 15 ounces of distilled water. It therefore contained 1 gr. (65 mg.) of morphia muriate in 106 minims (6.4 ml.) of solution. So, if Wood injected twenty drops of a solution about double this strength, he gave a dose of about $\frac{2}{3}$ gr. (26 mg.) of morphia hydrochloride.

Although Wood, like Rynd, was interested mainly in the relief of pain in the neighbourhood of the injection, he realized that general effects were important too. His conclusions indicate this quite clearly:

"1st, That narcotics injected into the neighbourhood [*sic*] of the painful point of a nerve affected with neuralgia, will diminish the sensibility of that nerve, and in proportion diminish or remove pain.

"2d, That the effects of narcotics so applied are not confined to their local action, but that they reach the brain through the venous circulation, and there produce their remote effects.

"3d, That in all probability what is true in regard to narcotics would be found to be equally true in regard to other classes of remedies.

"4th, That the small syringe affords a safe, easy, and almost painless method of exhibition.

"5th, That, destitute as we are of any precise experiments as to the applicability of cellular tissue as a medium for the reception of medicinal agents, the experiments made with the syringe show that it seems to offer an excellent surface for the absorbent action of the venous system."

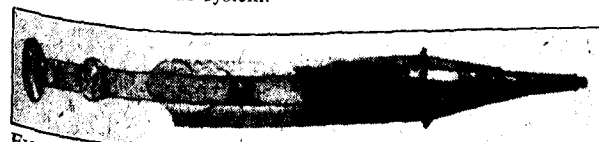


FIG. 3.—Dr. Alexander Wood's syringe (by courtesy of Mr. J. N. J. Hartley, Curator of the Museum of the Royal College of Surgeons of Edinburgh). Since this photograph was taken the syringe has suffered further damage and the barrel is now shorter than shown here.

These passages make it quite obvious that Wood realized the general applicability of his method. But in spite of this he was mostly concerned with injections at the seat of the pain, although he believed that both a local anaesthetic effect and the general narcotic action of morphia were of value in the treatment of neuralgia.

The syringe which Wood used is well known and is preserved in the Museum of the Royal College of Surgeons of Edinburgh. There is no trace of the needle (J. N. J. Hartley, personal communication, 1952).

Wood's Syringe and Method of Injection

Comrie (1927) described Wood's syringe thus: "The syringe is 90 mm. in length, and the barrel, which has been broken towards its base, is 10 mm. in diameter. The piston is wrapped round at its extremity with cotton wick to make the plunger fit the barrel. At its apex the barrel is drawn into a conoidal extremity which fits a metal nose cap. The cap is of curious construction and consists of one inner filler-shaped part which fits closely to the diminishing portion of the glass barrel and ends in a pointed extremity, which is threaded externally, to allow a hypodermic needle to be screwed on. The filler-part is grasped by a metal arrangement, whose apex is tightly applied to it at the screw. It is prolonged upwards by two lateral metal strips, bound

by a circle round the middle of the inner cap, and prolonged upwards further by the two lateral bands, to end in a ring, which does not touch the barrel, and may have been used to steady the syringe and prevent the metal cap being forced off during administration of a hypodermic injection."

It is surprising that Wood did not describe the needle, for it is such an important part of the equipment, and differed from anything before it in being attached to the syringe to form a composite instrument. Far from describing the needle, he wrote, in his 1855 article, about inserting the syringe. However, his biographer, the Rev. Thomas Brown, who married Wood's sister, stated that the design was based on the sting of the bee (Brown, 1886). This information was probably obtained from Wood's description of the type of syringe he was using in 1858, one which had been improved by the addition of graduations to the barrel. "The instrument is of the simplest construction and is a modification of Mr. Ferguson's, already alluded to. It consists of a small glass syringe graduated like a drop measure, and to this is attached a small needle, hollow, and having an aperture near the point like the sting of a wasp" (Wood, 1858). These scant statements appear to be the only information about the actual needle used by Wood. The needle is probably more correctly compared to the sting of a wasp than to that of a bee, because of the barbs on the latter. The photograph of the syringe shows that the nozzle was adapted for the application of some kind of needle which screwed on to the metallic male end of the apparatus.

Wood's method of injection was taken up by others in many countries only after his 1858 paper. At first, however, all adhered to the principle of injecting the pain-relieving drug into or near the site of the pain. The demonstration, that to relieve pain the injection of morphia did not have to be at the sore place, was due to a London surgeon, Charles Hunter. He pointed out that repeated injection into "an unsound or morbidly sensitive part" increased the tendency to sepsis, and was accompanied by great pain during the actual injection (Hunter, 1859). He maintained "that, by the introduction of narcotics into the cellular membrane of the body, we have a mode of attacking and subduing cerebral excitability more rapid, more certain, and more pure in its action, than by stomachic doses of narcotics." Hunter described the needle he used, and gave an illustration of it (Fig. 4). The "pipe," as he called it, was

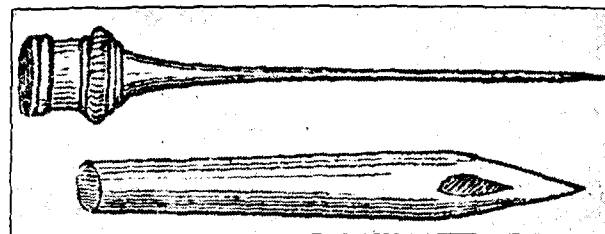


FIG. 4.—Hunter's needle. (From *Med. Tms Gaz.*, 1859, 19, 354.)

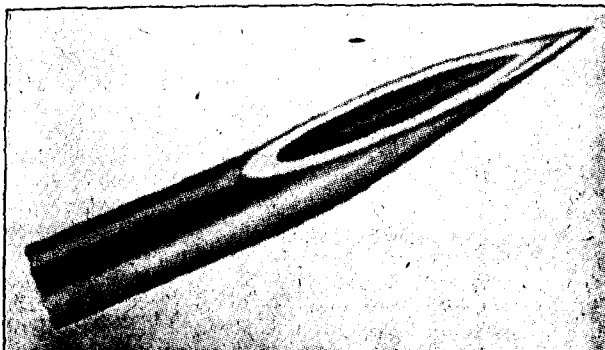


FIG. 5.—The Huber needle. (Reproduced, by permission, from the article by Dr. O. Schwidetzky in *Medical Physics*, vol. 2, edited by Dr. O. Glasser, Year Book Publishers Inc.)

made of silver with a hardened gold point. He had two pipes, the smaller of which was about 1½ in. (3 cm.) long and about 25 or 26 s.w.g. Each pipe was pointed "like a needle," tapering from all angles as does a pencil point, and occupying a place between the usual hypodermic needle of to-day with its bevelled end and the Huber needle (Fig. 5). Hunter went on to use drugs other than morphine and to develop the grandiose idea of a "hypodermic treatment of disease."

Biographical Notes on Dr. Wood

Dr. Alexander Wood, who undoubtedly deserves the credit for the introduction of the hypodermic method, was born at Cupar, Fife, on December 10, 1817. He belonged



*From the
Edinburgh*

FIG. 6.—Dr. Alexander Wood as an elderly man. (From Dr. Alexander Wood, M.D., by Rev. Thos. Brown, Edinburgh, 1886.)

to a family distinguished medically, and his ancestry has been traced to a Dr. Alexander Wood, "who in 1682 married the daughter and heiress of Jasper Johnston of Warriston and Curriehill" (Brown, 1886). The Alexander Wood of hypodermic fame is often called Secundus to distinguish him from his grand-uncle, an earlier Dr. Alexander Wood (1725–1807), familiarly known as Lang Sandy. Educated at adventure schools until 1826, Wood Secundus then went to Edinburgh Academy, opened two years earlier. Entering Edinburgh University in July, 1832, he took the usual

Arts course at the same time as he followed the medical curriculum. One of the great men who had a profound effect on Wood at the university was Dr. (later Sir Robert) Christison. Wood was a member of the Royal Medical Society, which he served as Junior President from 1837 to 1839. He graduated on August 1, 1839. In 1840 he was elected F.R.C.P.Ed., and in 1841 was appointed Lecturer in the Practice of Medicine at the extramural school.

His first published paper was on poisoning with corrosive sublimate (1839); this was followed by others on homoeopathy (1844, 1845), mesmerism (1851), and subcutaneous injection (1855). In 1842 he married an Irish lady, Rebecca Massey, of Tipperary; so far as I have been able to find, they had no children. He took a lively interest in medical politics, and was a representative of Scottish medicine on the General Medical Council in London. Elected sixty-seventh President of the Royal College of Physicians of Edinburgh, he remained in this coveted position from December, 1858, to December, 1861. He was a formidable debater at professional meetings, but was very gentle and kind as a teacher in the Sabbath School. His religious habits are certainly not in keeping with the suggestion that he purposely instituted, or knowingly allowed to continue, the false impression that his first subcutaneous injection was performed in 1843 and not 1853. He died on February 26, 1884.

Terminology

When Wood introduced the method of injecting drugs below the skin he called it the "subcutaneous" route. When Charles Hunter, as already described, extended the applications of the method he introduced the term "hypodermic." Hunter's reason for giving a new name to his method, which really only withdrew the emphasis from the local action, was, no doubt, that he wanted his "remote" injections to be regarded as something completely new and different from the locally acting injections of Wood and Rynd. Wood and Hunter carried out a long correspondence in the *Medical Times* and *Gazette* on the subject of who was the first to recognize the remote effects following an injection (for references, see Howard-Jones, 1947).

The names applied to the injection of fluids under the skin are interesting. Called by Wood "subcutaneous" after the Latin—the word being in use before Wood's time—it was dubbed "upodermic" by Hunter in his first paper on the subject. Upodermic was used because it was of Greek origin and therefore similar to the terms endermic and enepidermic, which were fairly common at that time. In his second paper Hunter used the term "hypodermic," adding a footnote, "In the first part of this paper the word hypodermic was spelt upodermic; but I now spell the word in accordance with common orthography." The most likely reason for Hunter's adoption of the form "upo" is that he did not realize the significance of the rough breathing mark in ὑπό. Perhaps some colleague with a better classical education pointed out the error in time for it to be changed in the second paper.

It is doubtful if Hunter was right in his choice of name, although he was justified because of the existing words from the same root. The name is derived from δερματικός, not δέρμα: the stem is dermat, as in dermatitis and dermatologist. Hence hypodermatic would be more correct than hypodermic. Hypodermic, however, is sanctioned by long usage and has the advantage of being the shorter form.

Early Forms of Hypodermic Syringe

The Ferguson syringe used by Wood is undoubtedly the forerunner of the modern "hypodermic," although there have been some modifications since it was first used for subcutaneous injection. The needle screwed on to Wood's syringe, and the glass piston, wrapped in cotton-wool or gauze to reduce leaks, was operated by a push-pull action. When hypodermic injection became popular on the continent of Europe, the syringes used were at first based on that which Pravaz had employed for injecting clotting agents into aneurysms. These differed from the Ferguson-Wood type, for the syringe was of metal and the piston was operated by a screw mechanism. The mode of use was also different: with the Pravaz type of syringe, which Béhier popularized in France for subcutaneous injections, a trocar and cannula were inserted through the skin; the trocar was withdrawn and the syringe screwed on to the cannula, which remained in position until the injection was completed.

This method was obviously cumbersome and it was impossible to avoid the injection of air. Besides, when injecting aneurysms, clotting was apt to occur when blood and sclerosing fluid met in the cannula and, when this happened, to cause a leak back past the piston. As most syringes were of silver the leak could not be seen; so, to obviate the difficulty thus caused, Lenoir had a glass barrel made for his syringe. He also introduced the use of a fine second cannula. This was attached to the syringe, charged with fluid, and inserted through the wider first cannula, already placed in position in the tissues. Lenoir's work is well reported in the *Association Medical Journal* (Report, 1853), but even when his modifications were adopted for subcutaneous injections the method remained complicated and was totally unlike present-day practice. In Wood's

technique, however, as in the modern hypodermic method, perforation of the skin was effected with the penetrating needle already attached to the syringe.

Advances in Design

The screw piston remained on Continental syringes until H. Wulffing Luer, a Parisian surgical instrument maker, introduced a metal-and-glass instrument which dispensed with the screw piston and adopted the push-pull mechanism of the Wood apparatus. Luer also rejected the screw mount for the needle, and in this respect set the fashion for the hypodermic syringe as we know it to-day. He did not adopt Wood's addition of graduations to the syringe barrel, but marked the piston-rod instead. Although his syringe had a push-pull mechanism there was a movable stop which traversed a thread along the piston shaft. By setting this stop before injection the dose to be delivered was fixed and could not be exceeded without further manipulation. A similar running stop is still to be found on some present-day syringes.

The next advance in syringes came about 1896, when Luer introduced an all-glass model (Schwidetzky, 1952). Schwidetzky also stated that the first of the familiar Record syringes was made in 1906 by the German firm of Dewitt and Hertz. Though the Record mount is probably the most widely used in this country to-day, it seems likely that it will ultimately be replaced by the Luer mount, which is much sturdier. The British Standards Institution has, in its specification BS 1263 of 1946, adopted the Luer mount for all-glass as well as metal-and-glass hypodermic syringes for general use. It is probable, therefore, that the standard for hypodermic needles will, when published, also specify the Luer fitting. It is to be hoped that, when this standard is drawn up, a rational orismological system will be advised and adopted. Such a system would improve upon the present habit of the use of manufacturers' code numbers, which often combine gauge and length of needle: in a pithy form it should give details of length of needle and gauge of cannula, type of point, and size of mount, with, if possible (but not so essential) the wall-thickness of the cannula. (There have, of course, been many other modifications to the hypodermic syringe, such as the use of rubber or leather washers on the piston; hollow pistons to contain needles or drugs; permanently fixed needles protected by covers, which could also be used to prepare injection solutions, and so on. But these are mostly side branches of the genealogical tree of the modern hypodermic syringe, and so have not been described.)

Future Development

It is difficult to foresee the future development of the syringe and needle, quite apart from the many special types which have been developed and which will no doubt be made for particular purposes, but it is interesting to speculate. Is it likely, for example, that the orthodox equipment will be replaced by the "cartridge" syringe, already familiar to dentists and of which only the needle has to be sterilized? Or will there be a return to their wartime popularity of those extremely handy, single-dose, collapsible tubes with covered, sterilized needles already attached? Or will the hypospray technique, described by Figge (1947) and Hingson and Hughes (1947), supplant the older methods? Will the many disadvantages of this new method, such as expense, limited dosage, frequent tissue injury, and complicated maintenance be offset by its simplification of the steps necessary for sterility and its ability to overcome the fear of the needle? Is it likely that Wood's lost needle will be permanently abolished by the wide acceptance of jet injection, which is only radical departure from the method used by Dr. Alexander Wood one hundred years ago?

At any rate, it is certain that, to oust Wood's time-tested simple, accurate, and flexible injection technique from its place of universal popularity, any new method will need to possess merit indeed.

Conclusion

It seems reasonable that, although no one individual was entirely responsible for the introduction of the method of injecting drugs into the subcutaneous tissues, Dr. Alexander Wood should be granted the major share of the credit. There is no doubt that drugs were inserted below the skin before his time, but Wood's method of injecting is the one we use to-day. True, Wood was obsessed with the idea of local action, and credit must go to Charles Hunter for turning the general systemic effects after hypodermic injection to good account. But Hunter used Wood's subcutaneous method and, calling it by its equivalent Greek name, merely extended its applicability.

So Wood, availing himself of an instrument which had been evolved for intravascular administration, performed the first subcutaneous injection shortly after 10 p.m. on November 28, 1853. He introduced the method "quietly and unobtrusively" (except for some bickering with Hunter over the question of who was the first to make use of the remote effects) and "left it to make its own way" (Brown, 1886). He made no fortune from his invention and gained little fame, for, although the method is in daily use by almost every practitioner, how many know the name of the man to whom the medical profession, and indeed mankind in general, is indebted for its introduction?

I am grateful to Dr. E. Ashworth Underwood, of the Wellcome Historical Medical Museum, for drawing my attention to the very complete historical survey of hypodermic medication by Dr. N. Howard-Jones, from which a lot of my information has been obtained. A further interesting and detailed account of the history of injection—intravenous, subcutaneous, and intramuscular—is contained in the centenary number of the *Ciba Zeitschrift* (March, 1946), which is entirely devoted to Die Injektion. I would like to thank Professor W. A. Bain for many stimulating discussions and for editorial criticism, though he has forbidden me to do so. Mr. C. N. England prepared all the photographs except Figs. 1 and 3.

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ATTEMPTED SUICIDE IN OLD AGE

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Suicide and the mental disorders of old people are two of the foremost social and psychiatric problems of today. Though the incidence and types of mental disorder occurring in old people have recently attracted much attention, and the rise of the suicide rate with advancing age has long been recognized, few clinical studies of suicide or suicidal attempts in this age group of the population have been reported. This is the more surprising since, as the proportion of old people in the community rises, the suicide rate may for that reason also rise. It is striking, for example, to find in a recent authoritative study of the mental disorders in later life (Kaplan, 1945) only brief reference to suicide, and no elaboration of its clinical aspects.

Gruhle (1941) is often quoted in an opinion which minimizes the importance of psychoses in the genesis of suicidal acts in this age group and emphasizes, as motives, morbid reactions to physical illness and mental incapacity, idleness, boredom, loneliness, and inadaptability in changed circumstances.

Swinscow (1951) in a valuable statistical investigation has come to the conclusion that "suicide in the last 50 years has increasingly become a disorder of elderly people," and has suggested that, "as the present century has advanced, the old may have found their environment more hostile than the young."

Kiorboe (1951) has made a study of 14 old people who committed and 21 who attempted suicide. His condensed findings cannot be abstracted briefly. All his cases were residents in an institution, and his sample is therefore not representative of the community at risk. His conclusions differ materially from those of this paper—for example, he reported in his group a high incidence of syphilis, and found alcoholism to be an important factor and loneliness rare as a motive for suicide.

Roth and Morrissey (1952), from a study of 150 patients over the age of 60 admitted to a mental hospital and a review of the literature, suggest a special association between old age and depressive illness, and support their opinion of the importance of the affective psychoses in this age group by reference to suicide rates. They report that only 12 of their 150 patients had made attempts at suicide, and that each of these was suffering from an endogenous depression. They are critical of Gruhle's opinions, and state that "it is not argued that social factors play no part, but that it is through their role in the precipitation of depressive psychoses that they contribute to the causation of suicide in the old." It seems possible, however, that the factors noted by Gruhle may act not merely as precipitants of depressive psychoses but more intimately in affecting their course and outcome.

There is obviously a need for further studies. Social and psychiatric data must be accumulated, from a sufficient number of cases, at different centres.

General Characteristics of the Cases

In a series of 200 consecutive cases of attempted suicide admitted to a general hospital in the years 1950-2 and personally observed, 40 (20%) were aged 60 years or over. These 40 cases have been studied in detail. The sample is small, but it is likely that it is reasonably representative of an urban population. The large majority of all suicidal attempts occurring in the city of Edinburgh are admitted to this hospital: suicidal attempts in old people usually demand active surgical and medical treatment, and there is naturally a great reluctance to commit an old person directly, as an emergency, to a mental hospital.

The sex, ages, and marital state of these 40 people are detailed in Table I.

TABLE I

Age Group	Male	Female	Total	Marital State	Male	Female	Total
60-64 years	5	4	9	Single	3	10	13
65-69 "	5	11	16	Married	7	3	10
70-74 "	4	6	10	Widow(er)	4	10	14
75-79 "	2	2	4	Separated	2	1	3
80-84 "	2	1	3	Divorced	—	—	—
Total ..	16	24	40	Total ..	16	24	40

Family Histories

In 26 (65%) of the cases there was a family history of psychiatric abnormalities, which were manifested in 54 of their relatives; 7 (17%) of the cases gave a family history of suicide, seven of their relatives having attempted suicide, five successfully. In 14 (35%) cases a history of mental illness in first-degree relatives was obtained. In 12 of these 14, affected relatives had suffered from severe depressive breakdowns: in 6 of the 12 the history was indubitably of manic-depressive psychoses.

Previous Personal Histories

One-half of this group of people (male 11, female 9) had experienced a "broken home" in their childhood. This high proportion corresponds to that found in a large series of cases of attempted suicide of various ages (Batchelor and Napier, 1953).

More than one-half of the cases (male 9, female 13) had been mentally ill before the present breakdown. Less than one-quarter (male 6, female 3) had previously received psychiatric treatment. The large majority of the previous illnesses had been depressive in character.

Seven individuals (male 5, female 2) had made a previous suicidal attempt. Three of these attempts occurred in an earlier phase of the present illness.

One-quarter of the group were considered to have adequate personalities. The remaining three-quarters seemed vulnerable. Most common factors were a morbid sensitivity and shy seclusiveness which had developed in some instances into jealousy, suspicion, and ideas of reference; and anxious, timid, obsessional dispositions with a tendency to hypochondriasis. A number showed undue dependency of long standing, and passive homosexual trends. The majority had restricted interests.

The intelligences of the group seemed to parallel those of an average sample of the population of the same age.

The great majority of these people had satisfactory work records; but their limiting personality traits, in the cases where frank failures in social adaptation had not occurred, had led usually to no better than fragile adjustments. Social adaptation had been defective in one-half of all the cases. Most of these people had had few friends: self-centred and prickly, they were disposed to loneliness. Only 7 (male 6, female 1) had a present affiliation to any organized non-religious group. Four of these seven individuals, all men, were members of clubs for old people.

Statistical researches seem to show that religious beliefs play some part in determining the incidence of suicide. Nothing definite in this direction emerged from the present investigation, so the data may be stated briefly. Of the group, 38 were Protestants (one British Israelite and one

Plymouth Brother included); 2 were Roman Catholics. Almost all expressed a belief in a personal God, while none denied His existence. The majority also believed in some sort of immortality or after-life; but 6 individuals (5 men) stated frankly their disbelief. Only 12 of the Protestants (9 women) were church-going; one of the Catholics had lapsed. These older people were on the whole more religious than younger suicidal individuals who were examined. But no evidence was found that their religious beliefs had played any significant part in hindering their suicidal attempts: not one of these people had consulted a minister in his perplexity or was inhibited by fear of punishment beyond the grave.

One-quarter of the group stated that they did not know that attempted suicide was an offence against the law; while only those whose previous attempts had brought them to police notice knew what precise action the law might take. No evidence was found to show that legal sanctions had acted as a deterrent.

Social Data

Table II gives an analysis of the social conditions of the group. One-quarter had suffered a fall in social status over their lives, which could probably be correlated with their personality defects. Only one individual had suffered any great change (decline) in social status over the past twelve months. Only three had experienced a significant change in their living conditions in the past twelve months. Apart from the three living a communal life in lodging-house or hostel, one individual suffered from overcrowding and three others lacked privacy at home.

TABLE II

	Male	Female	Total
(A) Present Social Class:			
I. Professional	—	3	3
II. Intermediate between I and III	2	3	5
III. Skilled workers	5	9	14
IV. Intermediate between III and V	2	5	7
V. Unskilled workers	7	4	11
(B) Present Employment Status:			
Employed (including domestic duties)	2	16	18
Retired	10	1	11
Unemployed, but fit (not retired)	2	1	3
Unemployed, but unfit	2	6	8
(C) Financial State:			
Adequate	10	21	31
Financial stress	4	2	6
Subsistence level	1	—	1
Below subsistence level	1	1	2
(D) Housing and Living Conditions:			
Stum	2	3	5
Artisan	11	5	16
Middle-income group	3	16	19
Living with offspring	4	7	11
" " spouse	6	3	9
" " sibling	—	7	7
" " other relative, friend, employer	2	2	4
Living in lodging-house or hostel	2	1	3
" alone	2	4	6

(E) Social Circulation and Mobility.—Of the group 38 were Scottish; 12 were rural bred; the majority had spent many years in Edinburgh. In the past twelve months only 5 had changed the locality they lived in, and all these moves were local ones in the city. As one might expect, social mobility was not high in this group: old people prefer to be stationary.

(F) Group Membership.—Details of religious and other group affiliations have been given under the heading of "Previous Personal Histories."

Psychiatric Diagnoses and Symptoms

Cases of attempted suicide in this age group are more easily classified than those occurring in people in the first half of life. The persons here are usually definitely mentally ill: at least two-thirds are certifiable as insane, and the personalities of the majority are clearly involved to a psychotic extent.

In younger age groups a heterogeneous collection of reaction types is found among cases of attempted suicide; and there is a considerable proportion of persons suffering from psychopathic states and of temperamentally unstable people allied to these in their reactions, whose precise psychiatric classification is difficult and debatable. But, in old people, clear-cut depressive states comprise the setting in which the great majority (80% in this series) of suicidal attempts occur.

About one-half of the cases of depression in this series were first attacks (Table III). Ten patients had suffered from one previous attack of depression, three from two, two from three, one from four, and one from more than four previous attacks. Only one of these 17 patients had previously

TABLE III

	Male	Female	Total
Depressive state:			
(a) First attack	7	8	15
(b) Previous attack(s)	7	10	17
Psychopathic state	2	1	3
Cerebral arteriosclerosis	—	2	2
Senile dementia	—	1	1
Tabo-paresis	—	1	1
Paranoid state	—	—	—
Total ..	16	24	40

attempted suicide. This suggests that the recurrence of a depressive reaction in old age tends to be less well tolerated than earlier attacks: understandably so, since the resilience of the old person is impaired, relapse has added its quota of disappointment, and hope for the future is less native.

Only four individuals (10%) suffered from organic reaction types. In each of them the dementing process had not advanced far. These findings are in accordance with expectation, since retention of affect and volition are prerequisites for the genesis of a suicidal act. The depressive affect was prominent also in each of these four cases: one had had a depressive illness, and another had attempted suicide, some years previously.

The symptoms which precede suicidal attempts in old people are symptoms which frequently precede suicidal attempts at other ages, and are the common features also of depressive states which may not proceed to suicide. Depression and insomnia are almost always present. The depression is usually accompanied by anxiety and agitation; there is usually little or no retardation, and the depression may even be masked by a smiling exterior. Insomnia is usually persistent and accompanied by great concern: "It was the want of sleep that was troubling me"; "I haven't slept for four months"—are typical protestations.

Loss of appetite and hypochondriacal complaints about the alimentary tract are common, and the individual may be exclusively preoccupied with them. Complaints of indigestion, flatulence, and intractable constipation may have more or less justification owing to the decreased physiological efficiency of the old person's body, but they often become morbidly dominating and have delusional force: "It's as if I was going to burst"; "I can't expel anything." Such hypochondriacal delusions may be accompanied by other nihilistic delusions—for example, of poverty. Ideas of reference are not uncommon, and a few cases had unsystematized paranoid delusions.

Feelings of weight upon and tension in the head, and head noises, are commonly the bases of fears of insanity. The patient may complain of a feeling of something about to snap in his head, or the feelings may be expressed in more bizarre terms: "It is as if my brains were turning upside down"; "Whiles you'd think there was cold water in it [head]." Only one individual attempted suicide at the command of auditory hallucinations.

A few patients who were fully orientated complained of being "mixed" or "muddled up." Three others of those suffering from depressions were transiently confused (for a few days) after their suicidal attempts and disorientated in time and place: in at least one of these cases the confusion

had also shortly preceded the suicidal attempt. In none of these cases was there evidence of drug intoxication or vitamin deficiency, nor, either at the time or later, were there symptoms of cerebral arteriosclerosis. None of them had an amnesia for the suicidal act. It seems possible that the intense, agitated preoccupation with the wish for death had caused a temporary clouding of consciousness, with neglect of the material environment. The term "catastrophic reaction" appears particularly applicable. The confusion in these cases cleared, to unmask a profound depression and intact faculties.

Indications that the inner tension was becoming intolerable to the individual were commonly present before the self-injury was inflicted. Twelve patients (6 men and 6 women) made direct suicidal threats in the present illness; 6 other women made suicidal threats by implication.

Physical State

The physical condition was unsatisfactory in 24 (60%) of the cases: 8 individuals were suffering from cardiovascular disease, 5 were disabled by arthritis, 4 had organic diseases of the nervous system, 3 affections of the alimentary system, 2 of the respiratory. One woman was suffering from mild bromide intoxication.

Serious defects in vision and hearing were found in 4 cases. Malnutrition and loss of weight were common; but in no case was malnutrition accompanied by clinical evidence of vitamin deficiency. Fatigue was almost constantly present.

The Suicidal Attempt

Old people seem to show a greater preference for active methods of suicide than do younger people. They can rarely give an adequate reason for their choice: the usual reply to questioning about this is, "I don't know." The figures given below show, however, that more than one-half of this series chose poisoning. In this age group, as in others, availability of method plays some part. It is interesting to note that all of Kjørboe's institutional patients used violent methods in their attempts.

Impulsive suicidal attempts in old people are much less common than in younger age groups. Less than one-quarter of the attempts in this series seemed to have been impulsive. More than one-quarter of them had been contemplated for weeks or months.

Four of the poisonings were multiple; these have been listed under the main toxic agent (Table IV). One man cut both throat and wrist.

TABLE IV

	Male	Female	Total
<i>Passive:</i>			
Poisoning	7	18	25
Barbiturate	4	11	15
Coal gas	1	4	5
Aspirin	1	1	2
Lysol	1	1	2
Ammonia	—	1	1
<i>Active:</i>			
Cutting	6	1	7
Throat	5	1	6
Wrist	1	—	1
Drowning	—	3	3
Jumping	1	1	2
Hanging, strangulation	1	1	2
Shooting	1	—	1

The attitude of the patients after their suicidal attempts is shown in Table V.

TABLE V

	Male	Female	Total
Suicidal intention admitted immediately	9	16	25
" " " denied; later admitted	4	4	8
" " " denied	3	2	5
Amnesia claimed	—	1	1
Not known	—	1	1

There is rarely any doubt that the suicidal attempt of an old person has been a genuine one. Those who deny their suicidal intentions usually admit to having had feelings of hopelessness. The denial may be paradoxical: one man who had come into hospital asking to be kept safe from his suicidal urges, later, when admitted after taking 100 aspirins, denied his suicidal intentions; a woman said, "I have a confession to make to you, I *didn't* attempt to take my life."

Of the 40 cases, 22 (55%) had to be admitted for further treatment to a mental hospital—almost twice the percentage immediately requiring such treatment in a series of cases of suicidal attempts in adults of all ages.

Precipitating Factors and Motives

The diagnosis of an abnormal type of mental reaction in the individual concerned is not a sufficient explanation of a suicidal attempt. While it is probably true that more suicidal acts in old age can be more nearly explained in terms of mental illness than is the case in younger age groups, the question immediately arises: Why is it the minority of the sufferers from these illnesses who are driven to suicide? There is no mental illness, in any age group, the majority of whose victims make suicidal attempts. A case history may be briefly quoted here.

A retired public servant aged 72, none of whose near relatives had been mentally affected and who had never himself previously had a nervous illness, whose personality had been robust and work record exemplary, was bereaved of his spouse. Shortly afterwards his only son married and brought a young and aggressive wife into the house. In this setting the old man became deeply depressed in his spirits, took alcohol in excess for the first time in his life, committed, while sober, his first police offence by shoplifting, and, when partly under the influence of alcohol, made a determined suicidal attempt. There was no organic mental deterioration.

The depressive reaction in this case apparently released three distinct kinds of abnormal conduct. Even if we suppose it to have been the essential condition for the development of the deviant behaviour, the different deviations cannot conclusively be given the same, even if it is an attractively simple, explanation. We cannot be content with the finding that the depressive psychosis has been the main item in the aetiology of this suicidal act.

In old people as in all other age groups, the aetiology of suicide and suicidal attempts is multiple. So far as we know, there are no aetiological factors, either personal or social, which are peculiar to any one age group. But in the case of old people certain personal factors are more commonly, and others less commonly, encountered than they are at other ages. Among suicidal old people feelings of loneliness and of increasing physical incapacity are very often found: dramatic gestures, demonstrations of omnipotence, and reactions of escape from social embarrassments are uncommon, and intoxication is less often a complication.

Loneliness.—Feelings of loneliness, of being a burden on others, or of being unwanted, found in 23 of the 40 cases, were the commonest psychological precursors of suicidal attempts in this series. Frequently the old person states that it was a feeling of estrangement which most powerfully prompted his act: "I felt as if nobody wanted me"; "I just stay myself, I feel lonely"; "I felt I was keeping my daughter back." The same sentiments are commonly expressed in suicide notes.

Social integration is a concept which is difficult to define, and which cannot be expressed satisfactorily merely by stating the living conditions. It is obvious that an individual who is living alone may not be lonely; while a member of a family group may feel isolated. Social integration exists where there is a reciprocal sympathy between the individual and his social environment: loneliness is a sensitive indicator of its deficiency. The domestic background of the cases of this series in which loneliness seemed an important factor is interesting and, though the numbers which may be quoted are too small to be dependable, they are probably significant. Loneliness was a factor in 10 of 11 of those

living with offspring, in 8 of 8 living alone or in a lodging-house, in 3 of 7 living with a sibling, and 0 out of 9 living with a spouse.

It is recognized that the incidence of suicide in an urban area may be correlated with the percentage of those in the community living alone (Cavan, 1928; Sainsbury, 1951). The above figures may be held to confirm this to some extent; but they also emphasize that the old person may be nominally integrated by being a member of a family group and yet feel socially isolated. There is a suggestion in these figures that to be with coevals is for the old person easier than to have to adjust to the pace of life and interests of younger people. And it was clear that, in certain cases, to the loneliness in some measure inseparable from old age it self there had been added the bitter experience of emotional rejection by the children who resentfully were materially supporting and housing the old person.

Physical Incapacity.—This was a major factor in 18 cases. It was not the degree of disability which seemed usually the important element, but the rapidity of its onset or its unexpected nature. The ageing individual, with limited assets, may have to meet abruptly a new and disturbing situation. A fall, producing only bruises and shock, or increased demands upon energy and resourcefulness owing to the illness of a helpmate, may bring the old person to a sudden realization of his frailty. Forced by ill-health to keep to the house or to take temporarily to bed, he may see in this a threat of permanent invalidism and helplessness, and decide that such a future would be intolerable. Many patients after their suicidal attempts reported such reactions: "I was beginning to feel my age"; "I felt I was done"; "Lying in bed for a fortnight upset things; I was accustomed to a hard life all my days." Physical pain and discomfort strengthened the suicidal urge in 8 cases. Increasing blindness was a leading cause of suicide in one case. Three individuals were severely deaf: though they did not make their deafness a major complaint, it must have contributed to their social isolation.

Fears.—Closely allied to the above and found also in 18 cases, based usually on a misinterpretation of somatic symptoms, are fears of having contracted a fatal physical illness or of becoming insane. The physical illnesses most commonly the foci of phobias were cancer and heart disease; phobias of tuberculosis and of venereal disease were also encountered. Eight patients feared insanity, and in three of these cases the suicidal act was precipitated by arrangements being made for mental hospital admission. Perhaps the most potent fear of all is the dread which is nameless and unfocused, and from which the patient sometimes comes seeking protection saying that he feels that something terrible, he knows not what, is about to happen.

Identification with a Dead Person.—In suicides of all ages, identification with, or the hope of rejoining, a dead person is a prominent motive: it was found in 11 cases in this series—about the same percentage of cases as in a larger group of adults of all ages (Table VI). In younger people the dead individual most commonly identified with is the mother; in old people it is the spouse.

TABLE VI

	Male	Female	Total
Identification with spouse	2	4	6
" " sibling	1	1	2
" " father	1	—	1
" " mother	—	1	1
" " offspring	—	1	1

Financial Anxieties.—These played a part in the suicidal attempts of 6 individuals (3 men and 3 women).

Hate.—Hatred of another person, an important and striking motive in many of the suicidal attempts of younger people, is a less common element in the suicidal attempts of old people—unless one is to presume its presence in all those who are living with relatives and are to some degree estranged from them. At any rate, if it is commonly present

as a motive in old people it is usually less obvious and less intensely focused. Few suicidal attempts in this age group are precipitated by overt quarrels; and spite, revenge, pique, and jealousy are infrequent motives. Homicidal trends were clearly identified in only four cases. One old man confessed to fears that he might harm the married daughter whom he was living with and who was showing him little affection; another warned his wife not to sleep with him, in case he might strangle her. A widowed woman brandished an axe over her only daughter, who was shortly to get married; and a spinster had obsessional thoughts and impulses towards attacking with a knife her younger and more attractive sister.

Guilt.—This factor, often difficult to assess, was infrequently expressed by these suicidal old people in depressive delusions or in self-reproach. It does not appear to be a major factor in the suicidal attempts of the senium.

Alcohol.—Three men were under the influence of alcohol at the time of their suicidal attempt, but not to the degree that they later had an amnesia for the act. Two men and two women habitually took alcohol in excess; two men and one woman had previously been alcoholic.

Other Factors.—Retirement from work contributed directly to the suicidal attempts of two men; but its more indirect and insidious effects are difficult to gauge. Recent moves of home and changed domestic circumstances precipitated the attempts of two women. The death of friends appeared to be the motive in only one case. Disillusionment is hard to judge: it is part of the senescent attitude to life; one would not expect it to be of lethal strength.

One is aware, in listing the various motives, that some of them are superficial and derived from the patients' rationalization, and that the explanations advanced are at best partial. Ultimately these morbid acts are discharged at an unconscious level and are the outcome of a tremendous emotional turmoil, of which we discern only some of the effects. We guess at the strength of the despair, and we assume, though we cannot clearly define, the lessened controls.

Discussion

The state of the old person who attempts suicide reminds us of the vivid words of that Anglo-Saxon elegy, *The Wanderer*:

"He knows who puts it to the test how cruel a comrade is sorrow for him who has few dear protectors; his is the path of exile, in no wise the twisted gold; a chill body, in no wise the riches of the earth; he thinks of retainers in hall and the receiving of treasure, of how in his youth his gold and the friend was kind to him at the feast. The joy has all perished. . . . Then comes darkness, the night shadow casts gloom, sends from the north fierce hailstorms to the terror of men. Everything is full of hardship in the kingdom of earth; the decree of fate changes the world under the heavens. Here possessions are transient, here friends are transient, here man is transient, here woman is transient; all this firm-set earth becomes empty."

In this age group, as in others, while suicide may appear a sufficiently logical reaction to an intolerable situation, it is in very few instances carried out under the direction of reason unperturbed by morbid emotions.

The infirm situation of the old person needs no elaboration here; his vulnerability to disease and death and his relative social inutility are obvious. With a sense of this latter old people may be rather deeply imbued. In certain primitive societies it was conventional, and apparently occasionally obligatory, for old people to commit suicide when on account of their infirmity they had become a burden on the rest of the community. A period of famine was then the usual precipitant of their self-sacrifice. While such crude biological and economic pressures have been more or less lifted from old people in our society, the mechanization, pace, and restless competitiveness of an industrial civilization may equally be inimical to them.

Prone as he is to painful feelings of being a burden to others, it is obviously very necessary for the old person,

particularly if he is no longer economically useful, to feel loved and wanted. There is much concern about the welfare of old people, but the very fact that their position is receiving such detailed scrutiny indicates that their social status is changing. In their ever-increasing numbers old people are becoming a social problem, and the fear is expressed that they may be becoming a social burden. Old people seem more often now to be falling outside family units. The attitude of our society as a whole seems to be ambivalent. There is a tendency, for example, towards segregating old people—a tendency which is not wholly explicable in terms of the housing shortage; and, while the importance to the old person of continued employment for as long as possible is stressed, arbitrary and traditional ages of retirement are maintained and even embodied in new legislation.

Though, judged by crude material standards (such as their financial state or their housing situation), the old people in this series of cases were in general not badly off, there was evidence that they were subject to environmental stresses, particularly to community attitudes expressed in the behaviour towards themselves of their own relatives, which, though more subtle, were not less wounding. Most of these old people were also temperamentally vulnerable. Many gave a family history or previous personal history of nervous or mental illness; many had suffered the disabilities of a broken home in childhood; and most of them had defects of personality which had made them prone to reactions of anxiety and insecurity, and to social isolation with its attendant feelings of loneliness. It seems that when a depressive illness develops in such a predisposed individual—particularly when resistance, already lowered by the effects of old age, is still further impaired by physical ill-health, and there is a lack of love due to the loss of a marital partner or rejection by offspring—a reaction of weariness, loneliness, and despair may be set in motion which tends to eventuate in suicide. This is a generalized statement; but it is doubtful if we have at present enough evidence to be more specific. Each case differs in certain respects; predisposing and precipitating factors vary in the relative intensities of their incidence, and much in every case remains unknown.

It is evident from the above that the known factors which tend to precipitate suicide in old people are the same factors which in general tend to precipitate their mental breakdown. The prophylaxis of suicide in this age group coincides, therefore, with the wider objectives of a programme of mental hygiene, about which fortunately there is now wide theoretical agreement. The promotion of optimum mental health in earlier years; the encouragement of continued occupation for as long as possible and the fostering of other interests; the maintenance of social integration; the avoidance of undue fatigue; the early and adequate treatment of physical illness and the alleviation of fears about it; the prompt diagnosis and treatment of mental illness, and particularly of depressive reactions; the recognition of the warning in the suicidal talk of the old person: all these items and objectives are of the greatest importance, and in their pursuance a great many agencies and individuals have their parts to play. The problem is far wider than merely a medical one. Suicide is a disease of the community, and the community as a whole has to exert many resources in its self-healing.

Summary

In a series of 200 consecutive cases of attempted suicide admitted to a general hospital 40 were aged 60 years or over. Detailed social and psychiatric data about these 40 cases are presented.

A family history of psychiatric abnormality was obtained in 65% and of suicide in 17% of the cases.

One-half of the group came from "broken homes." More than one-half had previously been mentally ill. Previous suicidal attempts had been made by 17%. Three-quarters had vulnerable personalities, which tended to isolate them socially.

Of the suicidal attempts 80% occurred in the setting of a depressive state. Evidence suggested that the recurrence of a depressive illness in old age had been less well tolerated than earlier attacks, and that the suicidal attempt of an old person is almost always a genuine one. Less than one-quarter of the attempts had been impulsive.

Significant physical disease was present in 60% of the cases.

Attention is drawn to the multiplicity of precipitating factors and motives, and stress is laid on the importance of feelings of loneliness and physical incapacity, fear, and identification with a dead person.

Adverse social factors of a material kind were found to be less important than community attitudes, which tend to make the old person feel useless and unwanted.

The importance of the problem of suicide in old people is emphasized, and a relevant mental hygiene programme is outlined.

We are grateful to Professor Sir David K. Henderson for his criticism and advice, and to Dr. J. K. Slater for permission to study these cases in his wards of the Edinburgh Royal Infirmary.

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WORK AND AGE: STATISTICAL CONSIDERATIONS*

BY

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I propose to deal with four basic considerations regarding the elderly worker: (1) the relative numbers of old and young people in the population; (2) the proportions of old people still at work; (3) the relative mortality risks to old people in various broad types of employment; and (4) the amount of time lost on account of sickness.

Population

It is no longer news to any audience to announce that the proportion of young people in the population of this country is becoming smaller and that the proportion of elderly people is increasing. This situation, which is occurring in a most Western countries as well as our own, is the result of a prolonged decline in the birth rate from about 1870 until about 10 years ago, accompanied by a reduction in mortality that began a few years earlier and which is still continuing. The outcome has been an age redistribution of the population, and Fig. 1 shows the changes that have occurred during the past 110 years and also what the situation is likely to be in 1991, as estimated on the basis of some simple and reasonable assumptions about trends of births and deaths during the next few decades. The proportion of the population of working ages, taking these as 15 to 64 years, has increased during the past century, and by 1951 there were 67 people of working age to every 33 people outside this age range—that is, two-thirds of the population in 1951 were aged 15–64. Unfortunately, the ratio of persons

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WORK AND AGE

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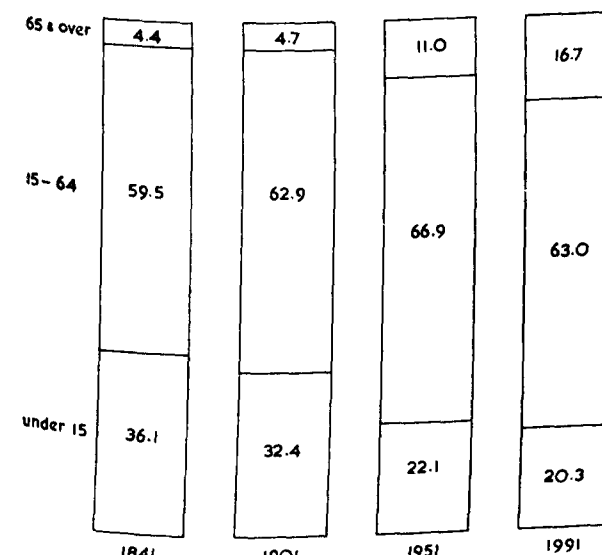


FIG. 1.—Percentage age distribution of the population (male and female) of England and Wales, past, present, and future.

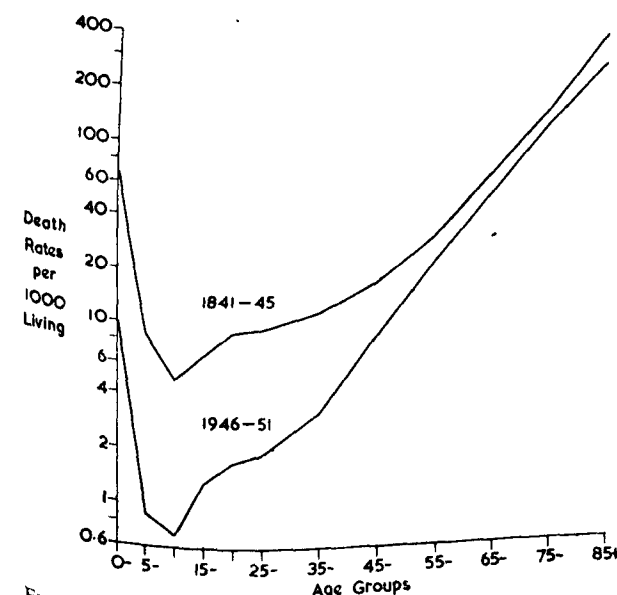


FIG. 2.—Death rates per 1,000 males in age groups, England and Wales, 1841-5 and 1946-51.

of working age to other ages is now just about its maximum, and by 1991 we shall be back to where we were in 1901. There will, however, be one very important change: a hundred years ago there were about eight children to every old person and at present there are about two children to each old person, but by 1991 there are going to be almost as many people aged 65 and over as under 15.

Now, although one of the main factors responsible for these changes has been improving mortality, the degree of improvement has been very different at different ages, as Fig. 2 indicates. During childhood and young adult life death rates have declined by 80% to 90% in the past 100 years, whereas at old ages the decline in mortality has been less than 20%. The effect of this differential improvement can perhaps best be illustrated by means of "expectations of life"—namely, the average number of years that people of a given age will live if subject to given mortality conditions. For a newborn boy in 1841 expectation of life was 40 years (Fig. 3) and by 1950 it had risen to 66 years—that is, an increase of 26 years. For girls the increase was even greater—namely, 29 years. For boys aged 15 years the expectation increased from 43 years in 1841 to 55 years in 1950. I mentioned, however, that improvement in mortality

has been greater at younger than at older ages, and the effect of this is seen in the changing expectation of life of people aged 60. In 1841 this was 14 years both for men and for women, but by 1950 it had increased for men only to 15 years and for women to 18 years. This is rather an important point: although expectation of life at birth has increased 20 or 30 years this does not mean that people approaching retirement nowadays have 20 or 30 more years of life before them than their grandfathers, or perhaps great-grandfathers, had. In fact, they will on average live only a year or two longer.

None the less there has been some increase, and in showing that the changes at older ages in mortality, and therefore in expectation of life, are small compared with younger ages I do not want to give the impression that the age structure of the population over the age of 60 has been quite static, though indeed it was so for a long time. Fig. 4 gives the proportions of men at various ages over 60 years in four different years. In 1841 and 1901, men aged 60–64 outnumbered those over 75 by more than 2 to 1; in 1951 the ratio was 3 to 2; and by 1991, if recent mortality trends continue, there will be as many men alive aged 75 and over as aged 60–64.

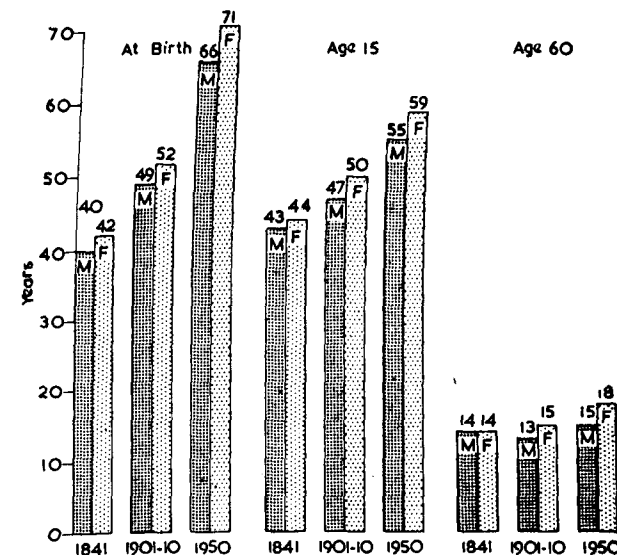


FIG. 3.—Expectation of life in England and Wales at various ages and at three periods of time.

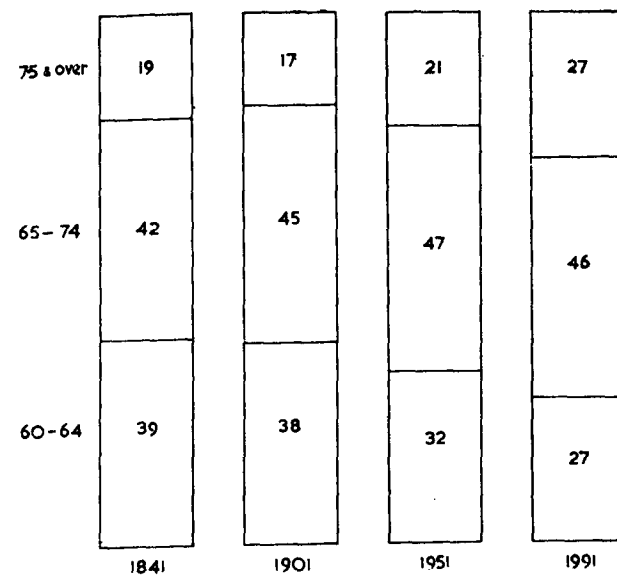


FIG. 4.—Percentage age distribution of male population of England and Wales, aged 60 and over.

I turn now to my second topic, the occupational distribution of the elderly population as determined by the 1% sample analysis of the 1951 census returns. Fig. 5 shows the proportions of elderly men describing themselves as occupied or unoccupied. At ages 60-64 87% were still working full-time and 10% were retired. At ages 65-69 the proportions of these two categories were practically equal—48% still working whole-time and 47% retired. In the next age group, 70 and over, 20% were working whole-time, and 70% were retired.

Fig. 6 shows the status distribution of men still occupied at ages 60 and over. At ages 60-64 operatives constituted 78% of the total, and men working on their own account 9%. By ages 70 and over the percentage of operatives had fallen to 64, with a corresponding increase in the categories of employers, managers, and those working on their own account. People in these latter occupations carry on working after many of the men classed as operatives have stopped.

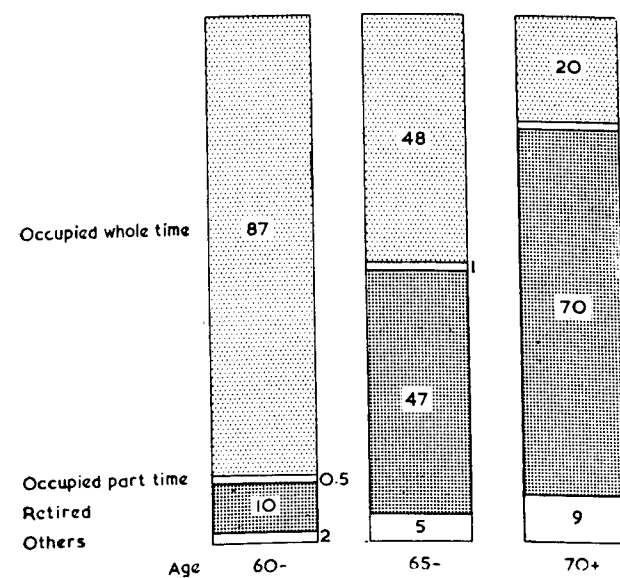


FIG. 5.—Percentage distribution of men aged 60 and over according to whether occupied or retired. Great Britain, 1951 census, 1% sample.

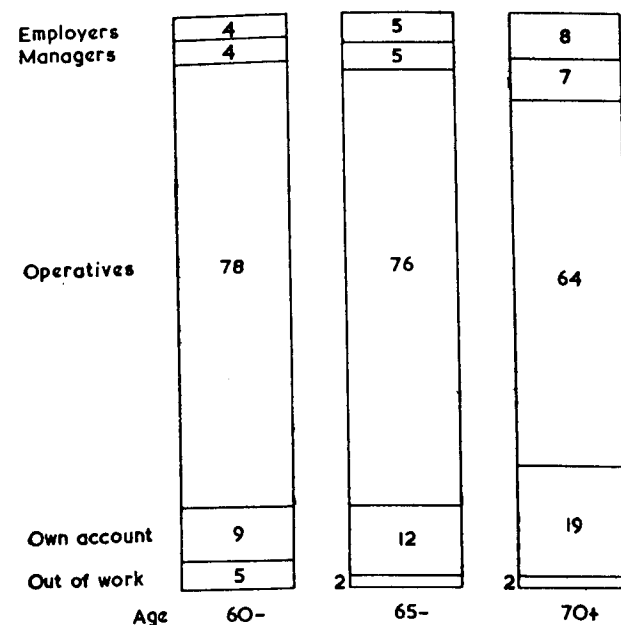


FIG. 6.—Status distribution of occupied men aged 60 and over. Great Britain, 1951 census, 1% sample.

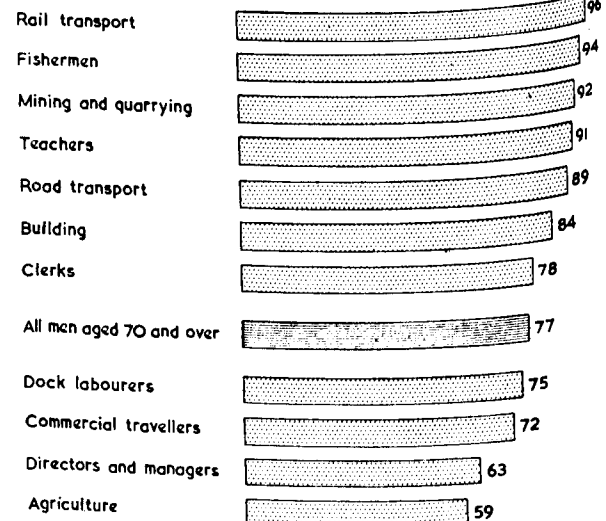


FIG. 7.—Percentage of men aged 70 and over, retired from selected occupations. Great Britain, 1951 census, 1% sample.

Fig. 7 lists a number of large occupational groups and shows the percentage of men aged 70 and over described as retired, expressed as a percentage of the total number of men at these ages in those occupations. The lowest proportion of retirements was for agricultural workers, 59% retired, followed by directors and managers, of whom 63% were retired. Occupations in which high proportions were retired were rail transport workers (96% retired), fishermen (94%), mining and quarrying (92%), and teachers (91%).

Occupational Mortality

Since 1851 it has been the custom of the Registrar-General to calculate occupational mortality rates for years in or around that in which there was a census, and in due course an occupational mortality analysis for years 1949-53 will be made upon the basis of the 1951 census. A preliminary analysis has just been completed for the year 1950, utilizing the census 1% sample occupational data, and Table I shows some of the results that have emerged. For men aged

TABLE I.—Death Rates of men Aged 60-64 in Selected Occupations Per Cent. of Corresponding Rate for All Men. England and Wales, 1950

Social Class	Occupation	Death Rate
II	Farmers	69%
	Hewers and getters	187%
	Other mine-workers	139%
III	Transport workers	108%
	Clerical workers	98%
	Armed forces	171%
IV	Agricultural workers	74%
	Mine-workers	101%
V	Building labourers	70%
	Dock labourers	128%

60-64 mortality was notably low for farmers, for other agricultural workers, and for building labourers, all with death rates less than three-quarters of the average for all men of that age group. Mine-workers in social class III—that is, skilled workers—had an unfavourable mortality experience particularly hewers and getters, and another occupational group with a high death rate at ages 60-64 were men described as members of the armed Forces.

Incapacity Amongst Elderly Men

One of the important factors to be taken into consideration in determining whether an elderly man is still employable is the amount of time he is liable to lose from work on account of sickness. Some information on this question can be obtained from the results of the monthly Survey

conducted in England and Wales from 1944 to 1951. For the purposes of this survey, incapacity was defined as inability on account of sickness to go out to work or, for persons not at work, inability to go out of doors. It is important to note this dual definition of incapacity, because it is a little difficult to interpret the figures for elderly men, many of whom do not go to work and to whom the second half of the incapacity definition applies. Since a retired man may be well enough to go out of doors but might not, had he been still working, been well enough to go to work, the incapacity rates revealed by the survey are not quite comparable from age to age. None the less they are worth looking at and thinking about.

In an average month of 1950 the percentage distributions of men aged 16-64 and men aged 65 and over according to their reported days of incapacity compared as shown in Table II.

Days of Incapacity	Ages 16-64	Ages 65+
0	91.3	89.1
1-3	2.7	1.7
4-10	2.8	3.4
11 and over	3.2	5.8

It is surprising how little difference there is between the two groups; almost 9% of men of working ages had some incapacity in the month, and for elderly men the proportion increased only to 11%. It was mainly in the group with incapacity of more than 10 days that the elderly men were in excess, their proportion (5.8%) being nearly double that for younger men. This predisposition of the elderly group towards more prolonged incapacity resulted in their having a quite definitely higher average incapacity rate than younger men—namely, 1.6 days per man per month, compared with 1.9 day for men aged 16-64. However, it must not be supposed that suddenly at age 65 the incapacity rate jumps from the lower to the higher level. The increase is gradual and continuous from about 35 years of age upwards, and indeed the figures suggest an actual falling off after 65.

Age:	16-	25	35	45	55	65	75+
Days of incapacity per man per month	0.69	0.69	0.79	1.02	1.61	1.57	1.58

By reason of the special definition of incapacity already referred to, applying to people who do not go to work, the flattening off of the rising trend of incapacity rates after age 55 is probably fallacious, and no doubt the curve in fact ceases rising. I do not want to enter into a detailed discussion of these incapacity figures, and I shall merely emphasize the two points which they bring out—namely, that the proportion of elderly men who do not have any incapacity is almost as great as for younger men, and also that there is no evidence of a sudden increase in incapacity amongst the higher age groups, but a gradual increase throughout adult life.

These figures support in a general way the thesis which is being increasingly put forward nowadays, that there is no justification for an arbitrary and rigid retirement policy applied to everyone at, say, age 60 or 65 years, or indeed at any age, on the grounds that beyond that age service will be so punctuated by incapacity as to make it unprofitable for it to continue. Though this is no doubt true for certain occupations that impose a heavy physical or mental burden upon the elderly and impair their health, it is not the case for the majority of occupations, and, provided an elderly man can be relieved of some of the load he has previously carried, there seems every reason for him to keep on working until his own individual state of health renders it expedient that he should stop. The important thing, however, is that he be relieved of his load, and in some cases this may be achieved only by change of occupation. There is indeed much to be said for every man taking stock of his

position when he is approaching the sixties and considering how long he will be physically and mentally able to carry on with his present job, and whether he wants to carry on any longer.

The man who carries on with his customary work after 60 may find himself unable to cope with it a few years later, and he may also find that he has lost the ability and inclination to turn to anything new: but the man who breaks away at 60 and takes on a lighter job, particularly if it is one in which he can find some personal interest, may find that he has embarked upon a second career in which he can continue to give useful and satisfying service for a further 10 years or more. Though we may all have some kind of humanitarian urge to relieve elderly people of the burden of having to keep on working for their living and to allow them the rest that they deserve, it has to be realized that to remove compulsorily from work an elderly man who is fit and eager to carry on doing something is not an act of kindness to that man. The suicide rate is high amongst elderly people. It might not be so high if more of them were given the opportunity of continuing to be useful, productive members of the community.

EXTENDING THE EMPLOYMENT OF OLDER PEOPLE*

BY

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(From the Nuffield Research Unit into Problems of Ageing, Psychological Laboratory, Cambridge)

It is perhaps presumptuous for a psychologist, especially an academic psychologist, to speak about the employment of older people, since industry and industrial medicine have had to deal with this problem in a practical way for many years, and have managed to solve it with very fair success in a number of cases. I hasten to say, therefore, that I speak with a very real sense of humility and that my remarks should be taken as suggestions for consideration rather than as confident assertions.

It is well known that the average age of the population has been increasing during recent years. From 1851 to 1921 the proportion of people over 65 was nearly stable at about 10% of those between 20 and 64, but in the 1951 census the proportion had risen to 18%, and it has been estimated that by 1961 it will be 22%, and by 1971, 28%. In other words, whereas up to the years immediately following the first world war there were about 10 people between 20 and 40 for every one over 65, there are now fewer than six, and 20 years hence there will be fewer than four. If present retirement ages continue there is likely to be a serious shortage of labour before long. Realization of this has led to questions being raised in many quarters whether employment and retirement policies for older people, built up in the early years of the century and in the slump conditions of the 'thirties, are adequate for conditions to-day. Even if they are, it is urged that some measures should be taken now to forestall future difficulties.

The problems of employing older people involve several disciplines. Some are medical. Some are economic, concerned with pensions schemes and pay

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rates related to age. Some are social, such as the effect of the age of retirement upon the age of promotion for younger men. I shall not consider these problems, but will confine myself instead to those which are concerned with some aspect of ability. I do this not only because these are the problems with which I am in closest touch, but because it is likely that many economic and social problems are secondary to them. It is well known that many changes occur with age—eyes and ears become less sensitive, reactions become slower, and ability to learn diminishes. These are facts we cannot escape. It is often believed that we can transfer the implications of these generalizations direct to the problem of employability, but this we can do only in part. Such generalizations are unduly wide, in the sense that they are true only of some people and in some respects. At the same time they are too narrow in that they fail to recognize many other changes which occur. Even when they are true the circumstances may be such that they are unimportant.

One of the commonest policies with regard to the employment of older people is some form of conscious or unconscious selection of a few to stay on while the rest retire. This policy is justifiable in the sense that for almost any job we like to name we can find some older people who can do it well. As we go up the age scale the differences between one individual and another become greater, so that, although the average performance may fall, some individuals will do as well as, or better than, the majority of young men. What is required, however, is a more radical solution than this. We need to specify work which is suitable for the majority of older people, which will enable them to continue at their jobs beyond what is now regarded as the normal retiring age, and in doing so to maintain their efficiency and self-respect, if possible without special allowances.

I will try to summarize the main points about what we know. Some are perhaps obvious, some may be new. As we know little as yet, I make no apology for giving some attention also to the methods of research whereby we can learn more.

Methods of Research

Two points should be stressed at the outset. The first is that our problem is not solely with employment beyond the normal retirement age. Ageing is continuous; by the age of 30 the beginnings of many changes, which become striking in extreme old age, can already be seen. As a result, many of the most important problems of ageing in relation to employment occur in middle age. The second point is that, as in most human affairs, it is that which is unpleasant and distressing to which we are apt to pay greatest attention. Most of the scientific knowledge we possess about ageing is of ways in which capacity and performance get worse as people grow older. There are, however, clearly ways in which age brings improvement, such as steadiness of character, conscientiousness, and patience. Unfortunately these qualities are elusive of precise definition and have so far not proved amenable to scientific study.

Scientific measurement of human performance in relation to age has been of three main types: (a) Surveys, using tests either of performance or of mental abilities, such as so-called intelligence tests. (b) More detailed studies of performance, using laboratory experiments in which people are given carefully designed tasks to do under controlled conditions. (c) Studies of present practice, population trends, age distributions, and labour turnover in industry.

None of these approaches is sufficient on its own. Mental tests show us some of the main outlines of ability, and,

although their results provide only a sketchy picture of human performance, they permit studies to be carried out on a large scale and so give data about norms of performance at different ages which are not readily obtainable in any other way. Such tests have shown that functions such as intelligence, speed of action, strength, and ability to learn by rote all decline with age, usually from a peak performance in the twenties. The decline is slow until the sixties, more rapid thereafter. The shortcomings of tests as commonly used are that the scores lump together many different aspects of capacity, and that we often have little idea of what they measure and whether one unit of score is equivalent to another. They are also not well adapted to the study of what we may call the process of a man's performance—the sequence of events whereby he attains a given end-result.

These disadvantages may be avoided in laboratory experiments which enable us to study performance in greater detail, and give a clearer lead to the understanding of why changes come about. With large groups of people laboratory experiments are too laborious, and this means some uncertainty whether samples of different ages are representative, but with care this drawback can be minimized. I will not enlarge upon the findings of such experiments, because they are the burden of most of what I have to say later. One other limitation upon them must, however, be mentioned. It is seldom possible to use this technique to study performances over a long period of time—usually about half an hour is the limit. We must therefore be cautious when drawing inferences from the results for work done day in and day out. This caution is necessary for two reasons: first, that performance can often be maintained for short periods at a level which is impossible over a longer working spell; and, secondly, it is probable that some of the difficulties experienced by older people in an experiment would disappear with long-continued practice.

Because of these shortcomings, problems of employment must at some stage be studied among people doing their daily work. The value of experiments lies in their helping to sort out genuine age trends in industry which are likely to lead to continuing problems from the multitudinous forces of social and economic pressures and accidents of history which tend to confuse the picture. The task of studying ageing in industry is difficult and demands much more care and clear thought than appears at first sight. It is all too easy on the one hand to leap to conclusions on inadequate evidence, or on the other to become bogged down in a despair of caution over the number of complicating factors which might conceivably be involved.

What we need to do is to take the results of laboratory experiments and to use them to tell us what to look for in industry, then, if the expected age trends are found and they are bad, we need to use our experiments again to suggest ways in which the trends might be minimized or removed.

When we look at industry in this way, it is necessary to look in detail, not at whole industries or factories or classes of work, such as skilled, semi-skilled, or unskilled, but at particular operations. Performance at any task will depend upon the match which can be made between the demands of the task and the capacities of the man doing it. The demands made and the capacities involved can vary greatly according to what at first sight appear to be trivial details of the task. Changes of performance with age will occur when changes of capacity become such that they can no longer be matched to the demands of the task. When this happens there appear to be three logically possible ways whereby a match may be restored: (1) the change in the man might be arrested or reversed; (2) the demands of the job could be modified; and (3) the man could be moved to another job making less severe demands.

Present policy usually concentrates on the third of these possibilities: certain relatively low-grade jobs, such as door-keeping and sweeping, are reserved for old people. This

policy would seem inadequate, however, not only because it wastes the skill and experience of men who were formerly doing higher-grade jobs, but because the amount of low-grade work available is not sufficient for the numbers of old people who will have to be employed.

1. Arrest or Reversal of Age Changes

In so far as changes of ability are underlain by definite organic changes, this line of action involves medical questions with which I am not qualified to deal. There is, however, another type of age trend we can legitimately consider—namely, attitudes and opinions changing with age, which sometimes seem to place older people at a disadvantage. To take one example: older people often lack confidence in their ability to an extent which is not justifiable and is revealed only when circumstances force them to do what they believed to be impossible. This lack of confidence is doubtless fostered by popular sayings and opinions, such as, "You can't teach an old dog new tricks," which are apt to cause exaggerated ideas of disability and lead to unwillingness to try. It may be due also to other attitudes—for instance, the desire to deserve the respect due to age and not to fail in the eyes of younger people; or the belief that hard work brings premature ageing; or, sometimes, bitterness at failure to achieve an ambition or lack of some worth-while goal for which to work.

How to assess these attitudes we do not know clearly at present. We can find out what people say about them, but such statements are often inaccurate, not only because of deliberate falsification but because people often do not realize their true motives. The understanding of these forces is still the province of the shrewd and wise observer, although, when the bogies from which they derive their strength have been discovered, scientists and educators can help in dispelling them.

2. Changing the Demands of the Job

The field which undoubtedly offers the greatest opportunity to improve employment prospects for older people lies in changing the demands made by certain classes of job. Some jobs seem to be such that the skills involved are well maintained into old age, but there are a few important exceptions. Difficulties are not always easy to detect. They may not show in such statistics as production figures, because as a man gets older he seems often to compensate for any growing difficulties by increased care and effort until the strain becomes too great to be borne; then, instead of carrying on at a reduced efficiency, he changes to another job. The reason given for his change may not be a true one. Sometimes, for instance, a change is made ostensibly on medical grounds, but if these are examined they are, as Richardson (1953) has shown, found to be insufficient to account for the magnitude of the change involved. It may sound a surprising suggestion, but I think it is scarcely an exaggeration to say that when a job is found where there is a substantial loss, for almost any reason whatever, of people in the forties and fifties, an age difficulty should be suspected.

We may consider difficulties arising in industrial work under three heads:

(a) Speed

Fall in speed of performance with age is common but by no means universal. It is very much greater in some tasks than in others; and in some tasks at least there is clear evidence that where older people are slower is in perceiving and giving meaning to incoming signals for action rather than in the actual speed of making responding movements. The time required to deal accurately with an incoming signal and to take the necessary action varies with the signal and action involved, but is seldom, for a man in the twenties, less than about half a second (for a review of the literature see Welford, 1952). This is the maximum speed at which we should expect a young man to pick up

items individually from a pile and place them in a machine—with one signal from the pile and one from the machine making one article handled per second. For people in their late fifties and sixties the time seems to have risen on an average to about two-thirds of a second. The implications of this are clear and obvious—we need to reduce the rate at which distinct signals have to be dealt with to the point at which the effective limit of speed at a job is transferred from the reaction time of the man to the operation time of the machine. This can be done in several ways: (a) By grouping signals so that, given the first of a sequence, the ones following can be "assumed" and require only a minimum of attention. (b) By sequencing actions automatically by machine. To carry this to its logical limit would convert the machine operator into a machine minder, but comparatively minor alterations coming far short of this could often make the required difference. (c) By reducing the accuracy required—for example, by making it possible for finished articles to be tipped into a chute instead of having to be placed accurately on a pile. (d) By giving older people larger products to deal with, which take longer to process. This is already done with good effect in some factories.

The amount of perceptual "effort" can be reduced by logical natural relations in laying out a task, as in the commonly used arrangement for an assembly job when one part is taken from each of a number of boxes in turn along a row. This arrangement may not, however, be enough to reduce the difficulty of the task for older people. Probably some indication should also be given which makes it unnecessary for the operative to remember from second to second where he has got to along the row.

It is important to realize that the perception of signals and the shaping of action in response to them can often take place while a previous action is being carried out, so that, if signals for actions are available a little ahead of the time at which the action is required, slowness in dealing with them will not be as apparent as if they appear suddenly and action has to be taken at once.

More subtly, it appears that every time an action starts or stops attention is apt to be deflected, probably by the kinaesthetic stimuli which result from the rapid acceleration or deceleration. This means that if actions can be rounded and continuous they are likely to be substantially faster, especially for older people, than if they are jerky and intermittent. This is an additional point in favour of giving signals for action ahead of time, because when this is done actions can be made to flow into each other smoothly.

Very often speed and accuracy of performance appear to be compensatory. Excessive speed will lower accuracy, and vice versa. In tasks where this relation occurs it is commonly found that older people choose accuracy rather than speed and that the accuracy they achieve often offsets their loss of speed, because they waste less time making errors. The logical conclusion to be drawn from this, which is followed with success in many cases, is deliberately to place older people upon tasks for which care and accuracy are more important than speed.

The most serious effect of speed for older people appears when this compensatory relation cannot be exploited. This is particularly the case with operations which we may call *paced*, where actions have to be taken at a speed which is not determined by the operator, and any slowness will lead to an error or omission which cannot be redeemed subsequently. The best examples of this occur on certain rapid conveyor lines. The numbers employed on these appear to fall away sharply between 45 and 55, so that after 55 hardly any are left. There seems to be little difficulty in recruiting people for these jobs even as late as 40 or 45, and often they seem able to carry on after 55 at the same work if they can do it at their own speed. A possible way of mitigating this difficulty is to introduce buffer-stocks along the conveyor line, which would afford a slight latitude

in the timing of individual items and enable the operator, if he is slow at one moment, to make up time in the next. It should be pointed out that not all conveyor lines have this characteristic of rigid pacing of performance. Some work at a speed which is comfortably below the maximum the operator can stand, and others are such that it does not matter if an item is occasionally allowed to go by (Belbin, 1953).

Mere pressure for speed such as that imposed by piece rates appears to cause less difficulty to older people than does rigid pacing. The reason presumably is that they are able to adjust the speed to suit themselves and to give full play to the advantages they gain from care and accuracy.

A very interesting study by Weston (1949a) of performance at a visual task has shown that poor lighting, small size of detail to be seen, and lack of contrast between objects viewed and their background can lower speed of work between the twenties and the fifties, even when subjects are matched for visual acuity by Snellen charts and Jaeger test types. It seems clear, as Weston (1949a, 1949b) points out, that improvement in one or other of these respects could often raise the speed of work by older people, and that any given degree of improvement would benefit them relatively more than it would younger people. It is also possible, although I know of no evidence on this point, that analogous improvements could be secured in tasks involving listening, as, for instance, when inspection work has to be carried out in terms of the sound made by the moving parts of a machine. Amplifying the sound or keeping down background noise might raise the speed with which faults could be detected under these conditions, especially by older people.

(b) Complexity

Loss of speed or accuracy, or both, appears to be much greater with some more complex tasks than with simple ones. This is not to say that the more complex tasks cannot be done at all, although the maximum possible complexity is probably diminished. Nor is it to say that the longer time taken by older people over a highly complex task may not be accompanied by the application of knowledge which has required a long experience to gather, and which results in decisions and actions having a degree of skill not attainable by a younger man. At the executive level, the implication is that a load of routine work on which occasional important decisions are superimposed is likely to tell on an older man more than on a younger, unless the routine is so simple as to require hardly any attention. Delegation and comparative leisure would seem to be especially important in later middle age if the highest quality of decision is to be maintained.

At the operative level there is evidence to suggest that four types of complication are likely to cause difficulty for older people. First, where actions have to be performed without adequate sensory data to guide them, as, for instance, where a man cannot see what he is doing (Szafran, 1951). Second, where a large quantity of data is presented for digestion all at once, especially if it is in an ill-assorted order—logical sequencing in the presentation of information would seem likely to be helpful to older people. Third, where a quantity of evidence has to be pieced together without using aids to memory such as notes. The fourth, and perhaps the most interesting, type of complication is concerned with what essentially amounts to a kind of abstraction. When we handle an object directly, as, for instance, when we move an object from one position to another by hand, the relation between the perception and the action involved is direct and simple. So it is with hand tools, such as chisels and hammers. It is, however, not so with machine tools, where the direction, force, and form of actions may bear only indirect or symbolic relations to the effects they produce. A very simple example of this is that the turning of a vertical wheel may bring about a horizontal movement of a tool carriage. Research on what are called display-control relationships of this kind has

shown that some are better than others even for younger men. The difference appears to be much greater for older men.

It is possible to get used to any display-control relationship, although unnatural ones may cause temporary difficulty in time of stress and lead to accidents. Persistent difficulty is likely, however, when the relationships keep on changing, as when a man works in turn on several different machines which have different systems of control. I think it is fair to say there is a great need for standardization in machine design, taking already well-verified research into account.

(c) Physical Demands

We are often told that heavy work is unsuitable for older people, and yet at the same time it is clear that a very large number of older people are engaged upon work which is classed as at least moderately heavy (Industrial Welfare Society, 1951). Several reasons have been suggested why they are able to do this work. It may be that physical development acquired when young enables them to continue when old. It may be that the knacks they develop in the course of experience make the work in fact lighter for them than it would be for a younger man. It may be simply that moderately heavy work does not make demands for muscular effort which are beyond the capacity of most normal older people. Discussion of heavy work in relation to age is hampered by a lack of knowledge of what "heaviness" means. We do not know whether it should be assessed in terms of physical effort and, if so, whether the maximum physical effort at any time or the average over a period, or whether it should be in terms of activity which might involve a perceptual factor in the sense that as a man turns to and fro he has to keep on looking first at one thing and then at another. Alternatively, some heavy work seems to be so classed mainly because it is dangerous, demanding either physical fitness and maintenance of balance, as when working at heights, or vigilance, as when handling dangerous materials. It is possible that heavy work as usually conceived means work which "takes it out of you" in any of several different ways, and that it is not really correct to think of all types of heavy work as belonging to a single class.

All forms of heavy work may be contraindicated for some people, and some forms of heavy work for all older people on medical grounds. Where these are absent it appears that while older people show a strong tendency to move away from really strenuous work (Richardson, 1953), they continue on jobs in which considerable physical effort is interspersed with periods of lower demand. It is probably true to say that moderate demands for physical effort cause less trouble to older people who are fit than does pressure for speed.

3. Training

However successful a policy of adapting jobs to the needs of older workers may be, there will be some men and women, as now, who must, or will wish to, leave their jobs and learn new ones in middle life. Such changes are not to be undertaken lightly, because, unfortunately, studies of learning indicate with striking uniformity a fall in learning ability from the twenties or thirties onwards. Beyond this age, learning to a fully adequate level can be achieved by some people and at some jobs, but it usually takes longer, and may therefore be prohibitively expensive. Good performances by a few middle-aged people who do train for new skilled jobs is not a reliable guide to the capacity of the majority, because almost certainly there are many who feel it is hopeless to take up a new skill in middle life, and only those unusually confident apply.

"Learning" is used as a blanket term to cover several distinct processes. The material to be learnt has to be perceived and comprehended. It has to be memorized, retained over a period of time, and then produced for use on a subsequent occasion. Now, there is evidence that

older people can usually remember well what they already know. The difficulty in extreme old age is mainly in the memory of the immediate past. Some people complain of loss of short-term memory much earlier, and we may well wonder whether it begins in a mild way in the thirties, or even the late twenties. These are the ages at which difficulties in training are usually first reported. Once a skill has been learnt it usually survives well into old age. It would seem, therefore, that the problem is really in the actual act of learning, so that the difficulty for older people occurs during the training session itself, and that difficulties in later performance are not due so much to failure of retention as of not taking enough away from the training session.

Difficulties in training seem to be of two main kinds. First, the perception and understanding involved take longer, and training is usually a "paced" task. Measures to avoid this difficulty should aim either at slowing down the pace of instruction, especially in the early stages, or at giving the trainee control over the speed. Thus, for example, we should expect an older person to do better on his own than in a group. Again, there is a little evidence which suggests that, if the trainee's educational level is suitable, written instructions may be better than demonstration. With written instructions the trainee can go back if he misses a point and can ponder anything which is not clear. Another possible means of reducing the time stress of instruction is to prepare for a change of job well ahead and give a trainee some opportunity of getting acquainted with his new job at intervals while he is still working at his old one. It may also be worth while to give rests and pauses during the training sessions. William James said that we learn to skate in the summer and to swim in the winter. His principle seems also to apply on a very much shorter time scale. Learning is often more thorough when brief periods of practice are interspersed with brief periods of other unrelated activity. Just how far this is important for older people is not at present known, but it seems likely that a leisurely and apparently time-wasting instruction would often lead to quicker and more complete mastery than one carried out on more intensive lines.

The second learning difficulty is that the comprehension of a complex task may be very hard to attain. Means of avoiding this difficulty are not well known, but breaking a complex task down into readily comprehended units, and attention to clarity of instruction in terms which are in line with what the trainee already knows, seem obviously worth careful trial and study. There is some evidence that older people are less tolerant of theoretical than of practical instruction, and that they do better if they are allowed right from the start to manipulate the material or try for themselves the machine they are learning to use. The reason seems to be that manipulation helps short-term memory in the same way that writing notes on paper helps with arithmetic. Theoretical instruction is like demanding that the arithmetic shall be done mentally.

When a trainee has failed to learn but is nevertheless forced to do something about a task with which he is confronted, he will inevitably tend to fall back upon his previous experience. This is not only true when training is nominally complete, but occurs also during the actual training itself. During the first training period he will build up some kind of method of doing the task which he will carry over to subsequent periods. If he is fortunate his method may be correct, and although speed may be poor he will improve with practice. If, however, he leaves the first training period with gaps in his comprehension of the correct method, these will be filled from his past experience, which may not be appropriate and may thus lead to errors which will have to be corrected. There is good evidence (Kay, 1951) that corrections of errors of this kind which involve modifying a method already built up are very difficult, so that if a trainee starts wrong he will have disproportionately greater trouble later. The principle is well known in learning games, typewriting, etc. It would

seem to imply that the very first stages of training are all-important and that time spent over these is likely to be well repaid by savings later on.

Past experience can, of course, assist in the mastery of a new task when the task can be carried out by methods already familiar. Confusion seems to arise mainly when the methods required for the new and the former tasks bear some resemblance but are not entirely the same. This leads to the paradoxical situation that it may be easier to learn a new task which can be carried out by methods already familiar than to learn new methods for doing a task which has been done before. Also it may sometimes be easier to make a clean break from an old job than to transfer to a job which is superficially similar.

Other suggestions about training deserve consideration. For instance, older people may not like to take instruction from those younger than themselves or to perform in a manner they think inexpert in the presence of other younger trainees. The means of avoiding such difficulties are obvious. Again, it has been suggested that one of the reasons why older people find it difficult to learn is because they have got out of the way of learning, and that if a person makes a point of learning all through his life he will still be able to learn when he is old. Another possibility is that if a man has once learnt a skill while he is young he can take it up again when he is old, even though it has not been used during the intervening years; so that learning a variety of jobs while young provides a range of alternatives ready to hand if a change of work has to be made in later life.

To conclude, it would seem that, apart from social, economic, and strictly medical questions, we have two important leads towards improvement in the prospect of successful employment of older people. The first is a close scrutiny of methods of work and the design of machinery, especially machine tools. This means that the tackling of the problems of ageing has to be carried back from the shop floor to the drawing-office, and becomes in a large measure the responsibility of engineers. Parallel to this, we need a close scrutiny of training methods and perhaps the establishment and very careful administration of special methods for older people. Both would, I believe, have an important bearing upon the problems of the industrial medical officer, and I venture to suggest that both need the co-operation of the experimental psychologist.

These developments would benefit not only older people but middle-aged and younger people as well, although the proportionate benefit would increase with age. They would not, of course, overcome the problem of age in industry completely, but they could go a long way towards reducing it. The benefits would not all be immediate. There might be some immediate rise in production, but the main advantages would appear only gradually in the stability and flexibility of industry. Stability would increase owing to men being able to stay on a job to a later age, with the consequent avoidance of labour turnover and the difficulties it causes both to industry and to the men involved. Flexibility would be extended in the sense that when necessity dictated a change of work in middle life it could be made with less of the suffering it often entails at the present time.

I would like to express my sincere thanks to past and present members of the Nuffield Research Unit into Problems of Ageing. Most of what has been said here has been based on their work, much of it as yet unpublished.

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COSTO-CLAVICULAR COMPRESSION OF
THE SUBCLAVIAN VEIN

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In recent years the conception of costo-clavicular compression of the brachial plexus has been recognized as often giving rise to symptoms formerly always attributed to the pressure of a cervical rib or to compression of parts of the plexus by the scalenus anterior muscle. Moreover, Eden (1939), Walshe, Jackson, and Wyburn-Mason (1944), and others pointed out that costo-clavicular compression may also involve the subclavian artery. Falconer and Weddell (1943) and Le Vay (1945), furthermore, described cases of costo-clavicular compression involving not only the nerves and artery but also to a slight extent the subclavian vein. I have not been able to find records of cases in which costo-clavicular compression or pressure by the first rib has produced its chief effect on the subclavian vein rather than on other structures. In the following two cases traumatic wrenching of the shoulder appears to have led to such a condition.

Case 1

A machine attendant aged 29 caught his right hand in a conveyor belt, which caused a violent abduction and pulling down of the limb. Something seemed to tear in the right side of the neck and axilla. He felt a severe aching in the axilla, neck, and shoulders, just above the cubital fossa and in front of the right wrist and back of the hand, and the limb felt heavy. Within an hour the arm and hand began to swell. The whole hand felt numb, tingled, and became cold. He was unable to bend fingers or wrist properly. Some four hours after the injury he was referred to hospital with intense oedema of the limb, which failed to subside. Two weeks later he suddenly developed a temperature of 100.8° F. (38.2° C.), rigors, pain in the chest, severe sweating, rapid respiration, and tenderness in the right axilla. He was admitted to hospital and treated with sulphathiazole and penicillin. He recovered from these symptoms in two weeks.

The condition of the arm remained unchanged for the next four months, at the end of which time he was referred to me. Examination then showed gross pitting oedema over the whole right upper limb. The veins were not visible

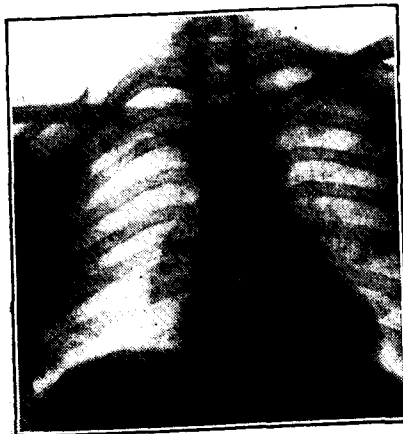


FIG. 1.—Radiograph of Case 1, showing the drooping of the right shoulder girdle. Note the different angles of the clavicles.

in the arm owing to the oedema. Some slight distension was observable in the right mammary veins. There was marked drooping of the tip of the right shoulder (about 3 in.—7.6 cm.). The right radial pulse was less easily felt than the left. B.P.: right, 142/90 mm.; left, 132/80 mm. With shoulders drawn back to the right B.P. was 110/40 mm., and the left 130/80

mm. Owing to the gross oedema it was impossible to tell if any muscle-wasting was present. All joint movements were limited by the oedema. Pin-prick was not appreciated over the inner side of the arm, forearm, and hand. It was found that if for a while the right arm was kept raised above the head the oedema diminished considerably. Radiographs confirmed the drooping of the right clavicle and scapula as compared with the left, but otherwise showed no abnormality (Fig. 1). A diagnosis of costo-clavicular compression of the subclavian vein was therefore made.

The patient was admitted to hospital and operation was carried out by Mr. A. D. Le Vay a year after the injury. The first rib was exposed through a supraclavicular incision and a large plexus of veins was found over the brachial plexus. The subclavian vein was compressed by the first rib, but contained no thrombus. The subclavian artery was normal. The omohyoid and scalenus anterior muscles were divided and 1½ in. (3.8 cm.) of the first rib underlying the brachial plexus and subclavian vein was removed. Some traction on the brachial plexus was necessary, and after the operation the patient developed slight ptosis, dropped wrist, and tingling and weakness of the four outer digits of the limb.

All oedema disappeared by the day after operation. He made an uninterrupted recovery, and returned to work five weeks after the operation.

Case 2

A cook aged 27 caught his right wrist in a food lift, which caused the whole arm to be wrenched downwards at the shoulder. This produced a sudden sensation of an electric shock passing up the arm. He was trapped for some time before he could be released. The arm began to ache, especially at night, the palm to tingle, and the limb swelled considerably throughout its extent during the next few days. The swelling was more noticeable when the weather was warm and was less marked on waking. The pain persisted for six months and was then replaced by numbness. The patient was referred to me 10 months after the injury.

On examination the hand and forearm showed severe pitting oedema. There was a marked drooping of the tip of the right shoulder. Partial fibrous ankylosis was present in the right finger and wrist-joints. No engorged veins could be made out in the oedematous limb, but the right mammary veins were dilated. The radial pulses were equal on the two sides. He seemed unable or disinclined to use the limb in any way, and it hung limply by his side. He could not be persuaded to exert any voluntary movement with it. All the tendon reflexes in the limb were unobtainable and all forms of sensation were apparently absent in a glove distribution reaching half-way up the upper arm. Radiographs confirmed the marked depression of the right as compared with the left clavicle, but showed no other abnormality. The arm was placed in a sling, so adjusted that it elevated the tip of the elbow and thus the tip of the shoulder. This resulted in a rapid disappearance of the oedema.

Two months later the patient was operated on by Mr. A. D. Le Vay through a supraclavicular incision, and partial removal of 1½ in. (3.8 cm.) of the first right rib was undertaken. Immediately after operation all the swelling rapidly disappeared, but complete paralysis and apparently complete loss of sensation of a hysterical type reaching as far as the axilla, in a glove distribution, remained. All the muscles responded normally to electrical stimulation. With massage, electrical stimulation of the muscles, and encouragement, symptoms gradually disappeared and he made a complete recovery within the next two months.

COMMENT.—It appears, therefore, that when the tip of the shoulder drops because of damage to or tearing of structures normally supporting it the subclavian vein may be compressed as it passes over the first rib, giving rise to venous oedema of the arm.

Significance of the Above Observations in Relation to
Oedema of the Arm Following Radical Mastectomy

After radical mastectomy swelling of the arm may occur whatever type of incision is used (see Veal, 1938). (In cases of malignant disease of the breast it occasionally occurs before operation.) The swelling may be brawny with thickening of the skin, or soft, with a thinned shiny skin. It is rare in the immediate post-operative period. It usually develops three to six months post-operatively, or it may not occur for a year or more. It may be accompanied by signs of recurrence of growth, such as a mass in the axilla, enlargement of the cervical lymph nodes, or nodules of growth in the scar. In other cases recurrent lymphangitis or cellulitis in the limb may precede the onset of oedema. In still others swelling occurs on return to normal activity with the arm. There may be no premonitory signs or symptoms. When swelling develops it may be persistent and progressive until the arm is enormous, or it may progress to a certain stage and then remain stationary, being unaffected by activity, dependency, rest, or elevation. Alternatively, the swelling may be intermittent, occurring during the period of activity and dependency of the arm and subsiding during rest and elevation. Usually the whole extremity is enlarged, but in some subjects the posterior portion of the upper arm is involved disproportionately. Disability of the limb is common and may reach complete incapacitation. Pain is frequent, and is either due to swelling or follows direct involvement of the brachial plexus.

Halsted (1921) demonstrated to his satisfaction the importance of lymphatic obstruction in production of the oedema, and this is the usually accepted explanation. He concluded that infection of the operation field leads to lymphatic obstruction, which results in swelling of the arm, and he applied to the condition the term elephantiasis chirurgica. All types of swelling are certainly not explicable on a single pathological basis, however, as it seems that the swelling may be caused by either lymphatic or venous obstruction; but it is difficult, especially in chronic cases, to differentiate clinically between the two types. The role of venous obstruction in this condition has received little attention. Veal (1937) studied 46 cases of swelling and 22 without swelling of the arm post-operatively and measured the venous pressure in the arm. He described venographic findings in 20 cases of post-operative swelling of the arm and classified the causes of the oedema into (1) lymphatic obstruction; (2) venous obstruction; (3) lymphatic and venous obstruction.

Lymphatic oedema is of a brawny type, persistent and only partially reduced by rest and elevation. The skin is firm and pits slightly, but does not wrinkle in the pit. This is the least common type after operation and constitutes about 10% of cases. Both superficial and deep lymphatics must be blocked. It may arise from recurrent or persistent infection of the soft tissues of the upper arm, axilla, and shoulder as a result of operative injury, in healed scars or recurrent carcinoma with ulceration of the skin surface. Patients often give a history of recurrent lymphangitis or cellulitis of arm and shoulder accompanied by chills, fever, and pain in the arm, neck, and shoulder. The cervical lymph nodes are often enlarged and tender. Swelling of the arm is usual with the first attack, but may subside with the infection. After recurrent attacks it persists. Occasionally direct extension of carcinoma is responsible for the lymphatic obstruction. Venograms show no block. There is no evidence of engorged collateral venous circulation or elevation of venous pressure in the arm.

Venous obstruction leads to a soft pitting type of oedema. The skin is thinned and tense, and wrinkles in the pit. Veal states that 70% of cases of post-operative oedema fall into this class. Swelling may temporarily disappear with rest and elevation. This type is commonly due to spread of malignancy to axillary and subclavian vessels. It may involve the wall of the vessels, leading to thrombosis. The veins may be occluded by benign operative scar tissues

within either a few weeks or months. X-irradiation may also cause scarring, with the same result. The vein is obstructed high in the axilla, as shown by phlebograms, and the external jugular vein may also be distended if the venous obstruction is above the entrance of this vein into the subclavian. The venous pressure in Veal's cases ranged from 19.5 to 140 cm. of water, with an average of 53 cm. (the normal at heart level is up to 12 cm. of water). Oedema of the arm may not occur until the pressure is above 25 cm.

According to Veal, ligation of the axillary vein does not cause oedema of the arm, provided sufficient tributaries are intact. Sudden occlusion of the axillary veins by thrombi, as in primary thrombosis and effort thrombosis, may lead to massive oedema of the limb, disappearing in a few days to weeks owing to the development of a collateral venous circulation, especially in the chest (Veal and McFetridge, 1935). These collaterals are, however, removed during mastectomy. Nevertheless, it has been shown above that obstruction of the subclavian vein into which the mammary veins drain, even if the latter are intact, will cause pitting oedema of the arm.

If the venous oedema is not soon relieved there is increasing evidence of lymphatic obstruction, and so cases merge into the lymphatic-venous type. This is the late result of venous obstruction, which leads to dilatation of lymphatics and incompetence of their valves. This is characterized by thickening of the skin with pitting oedema, and is only slightly affected by rest and elevation. Dependency of the arm helps to prevent emptying of the lymphatics. Infection may follow. Venographic and venous-pressure findings are as in the venous group.

I have investigated 32 cases of post-operative oedema of the arm after radical mastectomy usually followed by x-irradiation. They were seen at various stages from 6 months to 15 years after the operation. Of these, four showed a marked drooping of the tip of the shoulder on the affected side. In all four the arm swelling appeared early and was noted when the patient began to get about after the operation and before receiving x-irradiation, which thus could not have played any part in its causation. No distended veins were visible in the oedematous limb. The venous pressure in the two arms was measured in these four cases, and were found to be as follows:

	Affected Limb	Normal Limb
First case	105 cm. water	7.3 cm. water
Second „	73 „ „	10.4 „ „
Third „	47 „ „	10.3 „ „
Fourth „	88 „ „	9.6 „ „

Oedema could be relieved by elevation of the tip of the shoulder by a sling passing under and raising the tip of the elbow. This indicates that the oedema in these cases was not due to dependency, but to venous obstruction associated with the drooping of the shoulder girdle. An example of such a case is the following:

Case 3

Ten years before attending for examination a woman aged 58 had a left radical mastectomy for carcinoma of the breast. Within a few days of the operation she noticed swelling and heaviness of the left arm. X-irradiation over the clavicle and in the axilla was begun later, hence the swelling of the arm could not be the result of irradiation. She had little pain in the arm and no sensory disturbance. She had not noticed that posture had affected the swelling.

On examination the whole upper limb as far as the clavicle was enormously enlarged with both pitting and solid oedema (see Fig. 2). The left clavicle was obviously considerably lower than the right and pointed downwards and outwards. The left arm veins were partially buried and were grossly dilated in the region of the elbow. There was great tenderness on pressure over the neurovascular bundle below the clavicle. The blood pressure in both arms was 175/100 mm. The left pulse, but not the right, was slightly diminished on depressing the shoulder. X-ray scarring and telangiectases could be observed above the left clavicle. Venous pressure in the right antecubital vein was 7.3 cm.

of water, in the left 105 cm. Radiographs of the chest confirmed the lower position of the left clavicle (Fig. 3). A phlebogram carried out by injection into the antecubital veins showed a hold-up of the radio-opaque material at the outer edge of the first rib on the left, but not on the right. The arm was rested in a sling so adjusted as to elevate the



Fig. 2. Photograph of Case 3 after radical amputation of the left breast with venous oedema of the left arm. Observe the drooping of the tip of the shoulder and clavicle on the left side.

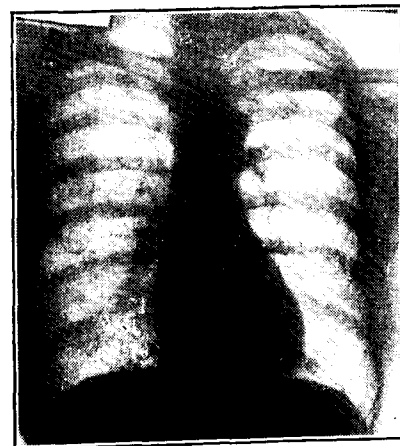


Fig. 3.—Radiograph of Case 3, showing the different position of the shoulder girdle on the two sides.

Summary

Two cases are described in which there occurred obstruction of the subclavian vein by the first rib as a result of tearing of structures supporting the clavicle. The injury resulted in gross pitting oedema of the arm, which was relieved by removal of a portion of the first rib. The significance of the observation in relation to some cases of post-operative oedema of the arm after radical mastectomy is discussed.

I wish to express my gratitude to Mr. A. D. Le Vay, who operated on Cases 1 and 2, and to the consultant staff of the Royal Cancer Hospital, for kind permission to publish this paper.

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PYLORIC STENOSIS AND FIBROUS STRICTURE OF THE STOMACH DUE TO FERROUS SULPHATE POISONING

BY

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During recent years several accounts of the effects of poisoning from compound ferrous sulphate tablets have been published, notably by Forbes (1947), Thomson (1947, 1950), and Spencer (1951). There has been an increasing awareness of the danger if these tablets are accidentally swallowed by children. The following case is thought worthy of record, as it exhibits certain features not noted in the cases so far reported.

Case Report

A previously healthy boy, aged 17 months, swallowed between six and twelve tablets of a proprietary preparation of compound ferrous sulphate at about 2 p.m. on July 21, 1951. He vomited shortly afterwards, and this was followed by haematemesis. On admission to hospital an hour later he was found to be restless and collapsed. Gastric lavage was performed and anti-shock treatment instituted. He continued to vomit small quantities of bright-red blood all that day. Next day he was quieter and vomited some dark-brown fluid only once, at 11 a.m. No further haematemesis occurred. He was discharged on August 3, by which time he was vomiting only occasionally and his stools were normal in colour. His weight at this time was 19 lb. 4 oz. (8,730 g.).

After discharge from hospital he failed to improve. The vomiting gradually increased in severity, and he was readmitted to the same hospital on August 14. On examination he was found to be dehydrated and very restless. He weighed 17 lb. 12 oz. (8,050 g.). On August 17 and 20 he vomited large quantities of curds. On August 25 his weight was 16 lb. 12 oz. (7,600 g.). A barium meal examination done on August 28 was reported to show a stricture of the body of the stomach, through which the barium passed slowly, and some oesophageal dilatation (Fig. 1).

On August 31 he was transferred to Hammersmith Hospital. He was found to be a grossly wasted and dehydrated child, with depressed fontanelle; otherwise physical examination was negative. Intravenous saline and dextrose were given, and feeds by mouth of 1 oz. (28 ml.) of milk with casydol. He vomited five times on September 1, and seemed to have abdominal pain on taking feeds. Next day he was better and less dehydrated. It was thought that there was probably an obstruction at the lower end of the oesophagus. A gastrostomy was therefore performed on September 4, and from then on he was fed by this route. During the next week vomiting still occurred, but consisted mostly of mucus. A chest radiograph on September 1 showed the lungs to be clear. Next day stomach aspiration yielded 13 oz. (368 ml.) undigested milk and mucus.

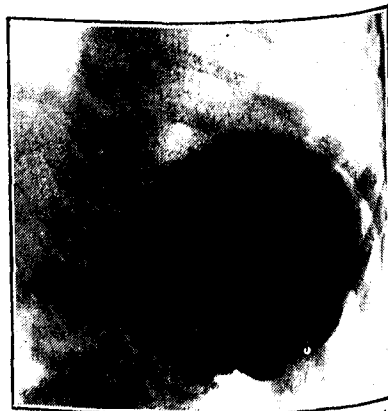


Fig. 1.—Barium meal August 28, 1951. Stricture of body of stomach.

On September 13 x-ray examination showed the tip of the gastrostomy tube in the oesophagus and some air in the large bowel. A barium meal was given by mouth. The oesophagus showed some dilatation, but no obstruction was noted at the lower end. The stomach contained excess resting fluid. A sharply demarcated constricting band was seen passing horizontally round the lower part of the body of the stomach. Distal to this the pyloric antrum was seen to be narrowed and its outline was slightly irregular. The

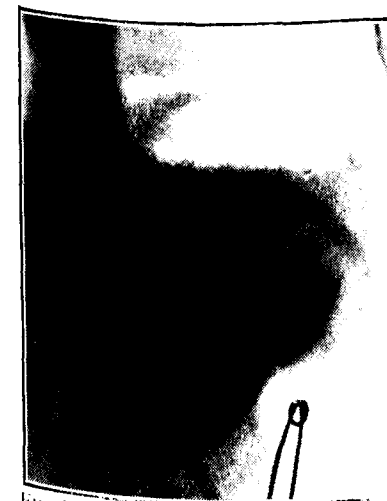


Fig. 2. Barium meal September 13, 1951. Stricture of body of stomach, narrowing of pyloric antrum, and pyloric stenosis.



Fig. 3.—Barium meal 20 hours after Fig. 2. Air content of stomach demonstrates stricture and narrowing of pyloric antrum. Small amount of barium in transverse colon.

tally. There also appeared to be fibrosis and narrowing of the stomach distal to this stricture, with almost complete stenosis in the region of the pylorus.

On September 15 jejunostomy was performed, and three hours later hourly feeds were started through the tube. In the next three days he gained 11 oz. (312 g.) in weight, and his general condition was somewhat improved. However, subsequent to this the child's condition gradually deteriorated, and he died on September 20.

Necropsy (Dr. Keith Simpson).—Forty hours after death. Body in a poor physical state, with considerable loss of flesh and marked dehydration. Recent operations for both gastrostomy and jejunostomy completed successfully and without operative mishap—but with suppurative peritonitis ensuing after the second of these procedures. No residual corrosive change at the lips or in the glottis and no mechanical obstruction to the cardiac orifice. Liver showed

mild toxic change only. Some excess mucus and oedema fluid was found in the bronchial tree, but no pneumonia nor pulmonary collapse was seen. There was early extension of infection into the right pleural sac from the peritoneum. In the stomach there was remarkable thickening of the wall by scar tissue extending distally from the lower third of the body. A broad band of scar tissue contracted the pyloric antrum transversely, and thickening of the wall extended into the pyloric sphincter. In the scarred area there was distortion and narrowing of the gastric lumen.

The cause of death was acute suppurative peritonitis following jejunostomy for obstruction to the stomach by scarring due to poisoning with compound ferrous sulphate tablets.

Discussion

Very few cases of pyloric stenosis and fibrous stricture of the stomach due to the ingestion of poisons, without producing concomitant fibrous stricture of the oesophagus, can be found in the English literature, but apparently such cases are more common in foreign countries. Cases have been reported due to the following causative agents: sulphuric acid (Halstead, 1919); hydrochloric acid (Schulenburg, 1941; Joll, 1941); formaldehyde (Vinson and Harrington, 1929); tincture of iodine (Wilensky and Kaufman, 1939); and lysol (Grey Turner, quoted by Schulenburg, 1941). Very recently a case has been reported of pyloric stenosis arising in a 3-year-old boy about one month after swallowing 67 compound ferrous sulphate tablets (Crosskey, 1952).

Compound ferrous sulphate tablets consist of ferrous sulphate 3 gr. (0.2 g.), copper sulphate 1/25 gr. (2.6 mg.), and manganese sulphate 1/25 gr. (2.6 mg.), usually coated with sugar and coloured bright green. Somers (1947) and Forbes (1947) have shown that the ferrous sulphate is the lethal agent, the small amounts of copper and manganese making no difference to the toxicity of the tablets. Forbes (1947) and Spencer (1951) have independently suggested that the ferrous sulphate is converted in the stomach into ferric chloride, the latter producing the main local lesions.

Twenty cases of poisoning with compound ferrous sulphate tablets in children have been reported in the literature so far. Of these, 10 (50%) have recovered, all apparently remaining symptom-free after discharge from hospital, and 9 (45%) have died within two and a half days. One case (5%) recovered, but subsequently developed pyloric stenosis. Nearly all these patients vomited after taking the tablets, but 66.7% of those that died had haematemesis or blood in the stomach washings, compared with only 30% of those that recovered without sequelae.

Experimental work by Somers (1947) and Forbes (1947) in animals has demonstrated that the gastric changes are roughly proportional to the size of the dose for each species. In children the gastric appearances at necropsy have been consistent and similar to those found in the experimental animal. In children there is an area of haemorrhagic gastritis with oedema (Prain, 1949) situated in the middle third of the stomach near the greater-curve side and involving both walls. A less degree of similar reaction extends over the rest of the stomach. Microscopy shows oedema of the submucosa, necrosis of the mucous membrane, vascular thrombosis, and impregnation of the mucosa and vessel walls with iron. Forbes (1947) and Spencer (1951) emphasize the haemorrhages that occur into the stomach wall.

It is unfortunate that the stomach in the present case was not examined histologically. It is evident, however, from the accounts given of similar cases and experimental work in animals that the process of repair following the intense haemorrhagic gastritis, if given time, would lead to fibrous contracture of the pyloric antrum and pyloric stenosis. This fibrosis may also be increased by superficial peptic ulceration and subsequent scarring following the shedding of the gastric mucosa. In fact, the development of the fibrous reaction in the submucosa and muscular coat of the pylorus was noted in the biopsy specimen in Crosskey's case (1952).

In the present case the rapid development of the fibrous stricture of the pyloric antrum and the pyloric stenosis can be seen by comparison of the two barium-meal examinations done 16 days apart. This clearly excludes a congenital abnormality.

Summary

A case of pyloric stenosis and fibrous stricture of the pyloric antrum developing in under two months in a child after swallowing compound ferrous sulphate tablets is described. Death was due to acute suppurative peritonitis following jejunostomy.

The literature on ferrous sulphate poisoning and fibrous stricture of the stomach due to the ingestion of corrosive poisons is briefly reviewed.

My thanks are due to the physicians and surgeons under whose care the patient was at Hammersmith and Margate Hospitals for permission to publish the case, to Dr. J. Duncan White and Dr. J. P. Thierens for permission to use the radiographs, to Dr. Keith Simpson for his necropsy report, and to Mr. Basden for the reproductions of the radiographs.

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METHOD OF PREVENTING INSULIN ATROPHY

BY

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Many theories have been put forward to explain the development of fat atrophy occurring at the site of injection of insulin in some diabetic patients, and in our opinion no better summary of these views has been given than that of Marble and Smith (1942).

During an extensive survey of 57 cases of insulin atrophy occurring in this clinic it occurred to us that, whatever the exact mechanism of its production, the high local concentration of insulin at the site of injection is probably a significant factor. Dispersal of this concentration seemed to be a logical step towards lessening or preventing such atrophy.

The use of hyaluronidase as a spreading agent suggested itself. The obvious danger was too rapid absorption of insulin into the blood stream, with consequent hypoglycaemia. Several stabilized diabetics in hospital, not showing insulin atrophy, were therefore given their usual doses of insulin with added hyaluronidase. No appreciable change was found to occur in their diabetic control. No hypoglycaemia was observed, whilst, on the other hand, there was no evidence that the insulin was rendered ineffective. In studying the control of

diabetics by the inunction of an insulin hyaluronidase mixture, Bresgen and Heinlein (1951) also found that the insulin was not inactivated.

Accordingly, in 1951 three children who showed marked atrophy at whatever site insulin had been given were chosen for a trial. They lived in a home for diabetic children attached to the National Children's Home at Frodsham, Cheshire, and their diabetic condition was under constant supervision by trained nursing staff. Areas in which insulin had not been previously given were chosen in each child for regular injections of an insulin-hyaluronidase mixture, and injections have since been confined to these new sites.

The insulin-hyaluronidase mixture was made daily by dissolving 3 mg. of hyaluronidase in 400 units of soluble insulin (80 units per ml.). From this mixture the individual doses were drawn up. This addition of hyaluronidase to insulin did not produce any alteration in their diabetic control, and injections of the mixture caused no more discomfort than had injections of insulin alone.

Case Reports

Case 1.—A girl born on December 3, 1938, had been a diabetic since 1944. She was first seen by us in September, 1950, when she showed insulin atrophy in both arms and both thighs. Her parents stated that the atrophy developed in the arms in about six months and in the thighs in about four and a half months after beginning insulin injections. Her diet contained 250 g. of carbohydrate daily up to May, 1952, since when she has had a "free diet." Injections of soluble insulin twice daily from September, 1950, to February, 1951, in the arms and thighs greatly increased the atrophy already present. Though she has had no more injections in the arms and thighs since February, 1951, the atrophy remains unchanged. From March 1, 1951, to January 27, 1953, the insulin-hyaluronidase mixture was given into the buttocks only. The total daily dose varied during this period from 72 to 88 units. No subcutaneous atrophy of the buttocks has developed from the use of this mixture.

Case 2.—A girl (born September 15, 1943) had been a diabetic since 1948, and was first seen by us in August, 1950, when she showed marked insulin atrophy of both arms and both buttocks. We were informed by her parents that insulin atrophy was "very bad" in the arms within about nine months of starting insulin injections. Her diet contained 160 g. of carbohydrate daily at first; it being increased to 235 g. at present. From March 1, 1951, to October 28, 1952, the insulin-hyaluronidase mixture was given into the anterior abdominal wall only. The total daily dose varied during this period from 64 to 68 units. No subcutaneous atrophy of the anterior abdominal wall has developed.

Case 3.—A boy (born September 4, 1941) developed diabetes mellitus in 1949, and was first seen by us in May, 1951, when insulin atrophy was present in both arms. At that time his diet contained 190 g. of carbohydrate daily, and this has gradually been increased to 250 g. daily. Injections of soluble insulin were given twice daily, into the left thigh only, from May 26 to November 20, 1951, the total daily dose varying between 84 and 45 units. Atrophy was then observed to have developed at this site. Since November 21, the insulin-hyaluronidase mixture has been given into the right thigh only. The total daily dose has varied between 48 and 56 units. The mixture has been used for 16 months up to March 20, 1953, and has produced no atrophy in the right thigh.

Discussion

It would seem from our observations in these three cases that the addition of hyaluronidase to insulin has prevented atrophy developing, whereas, with insulin alone, atrophy

had appeared in a few months in each case. The chief benefit from the use of this method, if its value is confirmed, would appear to lie in the alleviation of this unfirmed, slightly effect of insulin therapy, which so commonly occurs in children and young women. Among 20 diabetic children at this home, insulin atrophy has occurred in 10 (50%).

There are, however, some practical points for consideration before the method can be applied to the routine outpatient treatment of diabetics. At present we believe that the insulin-hyaluronidase mixture must be freshly prepared each day, as its spreading action begins to diminish after eight hours. A more stable preparation would have obvious advantages. Further, it is probable that we have been using an excessive amount of hyaluronidase.

Summary

Three cases are described in which an insulin-hyaluronidase mixture has prevented the onset of insulin atrophy.

The practical difficulties in the giving and preparation of this mixture are discussed.

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Medical Memorandum

A Case of Friedländer's Pneumonia Treated with Aureomycin

The incidence of Friedländer's pneumonia has been estimated as 0.8 to 4% of all pneumonias. Rosenthal (1949) points out that these figures are probably too high, as it is only the severe pneumonias which are admitted to hospital.

Before the introduction of the sulphonamides the mortality was approximately 80%. With their advent it fell to 60%, only to rise again when they were gradually replaced by penicillin—which is almost completely ineffective against this organism—as the treatment for all types of pneumonia. Gill (1951) believes that penicillin may actually be harmful, stating that all his patients treated with penicillin alone died. In the days before any specific treatment was given, 20% recovered. He suggests that this may have been due to the penicillin killing susceptible organisms, thereby giving the Friedländer's bacillus a free field.

Streptomycin has proved more valuable than the sulphonamides, and some encouraging reports have been published (Barber and Grant, 1952). However, as this condition can become chronic, and as the dosage of streptomycin needed may be high, complications of treatment may arise. Furthermore, strains exist which are resistant to streptomycin, so that some other antibiotic may be necessary. This is a report of such a case, in which aureomycin proved effective.

CASE REPORT

On January 17, 1951, a married woman aged 40, who had previously enjoyed good health and who was seven months pregnant (para 8) developed a "severe chill." She was attended by her doctor, who diagnosed influenza, which was at that time epidemic in Dublin. On January 19 she had a spontaneous precipitate delivery in the toilet. The next day she was admitted to the Mater Nursing Home under my care, her doctor having found evidence of consolidation in the upper lobe of the left lung. On admission this finding was confirmed, and she was noted to be extremely dyspnoeic. She was given oxygen, and started on penicillin and streptomycin in heavy dosage. Twelve hours after admission the cyanosis was less, but she complained of intense chest pain, which was not completely relieved by morphine. She was now coughing sputum which resembled tomato sauce in consistency and colour.

On examination the whole left lung was found to be consolidated. Toxaemia was marked and restlessness was extreme. The nature of the sputum, the degree of toxaemia, and the complaint of intense pain suggested a diagnosis of Friedländer's pneumonia. Aureomycin, 500 mg. every six hours, was begun. Bacteriological examination of the sputum was not possible until January 22, when a culture gave the following results: "Organisms were present in scanty numbers only. A growth of Gram-negative bacilli of the Friedländer group was obtained. The sugar reactions were characteristic." These organisms were subsequently demonstrated to be resistant to penicillin and streptomycin, but sensitive to aureomycin. On the same date the white cell count was 14,000 (74% polymorphs).

During January 22 and 23 there was a slight improvement in the clinical condition. Toxaemia was less but the cyanosis was still pronounced. X-ray examination showed involvement of the whole left lung.

On the night of January 24 the patient, after a bout of coughing, complained of an empty feeling in the left chest. When seen a few hours later she was found to have a left pneumothorax.

On the morning of January 25 fluid was present in the left chest. Culture of this fluid showed a heavy growth of Gram-negative organisms of the Friedländer group. This organism displayed the same sensitivity characteristics as that isolated from the sputum. X-ray examination showed almost complete collapse of the left lung with a fluid level in the fifth space.

Oral aureomycin was continued. In addition, the pleural cavity was aspirated daily and 100 mg. of aureomycin (intravenous preparation) was injected intrapleurally. In spite of these measures the pus remained thin. An intercostal drain was then inserted and permanent underwater drainage was established (Mr. E. O'Malley).

Regular intrapleural aureomycin was continued for many weeks, without rendering the pleural fluid sterile. The lung displayed little inclination to expand, although the quantity of fluid in the chest was gradually diminishing. It was considered that gross pleural thickening had occurred, and that spontaneous expansion was unlikely. On March 14 Mr. M. D. Hickey was consulted and the patient transferred to Rialto Chest Hospital on March 19. Daily aspiration of the pleural cavity was continued until April 17, when decortication was performed by Mr. Hickey. The operation was followed by almost complete expansion of the lung, with the exception of a small pocket in the lower anterior chest. This pocket was aspirated repeatedly.

By the end of May the sputum had decreased in amount and it had become increasingly difficult to aspirate any fluid from the pocket. During this time physiotherapy was carried out in an effort to promote complete expansion. On May 30 4 oz. (110 ml.) of very offensive sputum was coughed up; in this way her empyema pocket was emptied through a bronchial fistula. The amount of sputum immediately fell to a trace, and further attempts at aspiration of the pleural cavity were negative.

She seemed now to have achieved good expansion, although there was radiological obliteration of her left base, due to pleural thickening. Her general condition was excellent, and she was discharged from hospital on June 20.

When last seen (April, 1952), aeration of the left lower lobe seemed complete. She felt very well and had resumed her household duties.

I wish to record my thanks to Mr. M. D. Hickey and the other members of the staff of Rialto Chest Hospital, Dublin, for their assistance in the management of this case.

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Reviews

AVIATION MEDICINE

Human Factors in Air Transportation: Occupational Health and Safety. By Ross A. McFarland, Ph.D. Foreword by Brigadier General James S. Simmons, Dean of Harvard School of Public Health. (Pp. 830; 155 illustrations. \$13.00 or £5 6s. 6d.) London and New York: McGraw-Hill Book Company, 1953.

The author of this book is associate professor of industrial hygiene at Harvard and during the past 20 years has had extensive experience, not only of industrial hygiene, but also of aviation, particularly as applied to commercial flying on a global basis. He has been fortunate in his contacts with various international authorities in aviation medicine, both in civil and Service circles, and many of the statistics and views expressed in this book have been compiled from their publications and reports, as well as from proceedings of conferences, congresses, and meetings which he has attended. This help of associates he generously acknowledges in the preface. There is, understandably, a natural tendency throughout to accentuate the American viewpoint, which at times is not in accordance with the concept on this side of the Atlantic. But this may do good by helping to stimulate fresh thoughts and researches and so help on progress.

This voluminous book is profusely illustrated and adorned with a plethora of statistical tables. It contains a wealth of information on most aspects of medicine in its broadest sense as applied to aviation, especially in the realm of commercial flying. Reading is heavy going, but fortunately each chapter has a good summary and an extensive bibliography. The subjects discussed include the physical and psychological selection and the maintenance of efficiency of aircrew and ground staff; the training of aircrew; operational fatigue; ageing and efficiency; survival and rescue; the sanitary and quarantine control of airports and aircraft; the care and comfort of passengers and the transport of invalids; and the organization of an airline medical service.

Some of the statistics are not convincing. For example, those on the sickness and accident incidences of aircrew are based on the records of one airline only for a solitary year, and those concerned with the relative personnel strengths and cost of the medical services of various airlines are not comparable since the commitments differ so widely. Certain airlines provide medical services only for contract staff, some provide for both contract and local staffs, while others go further and give cover to wives and families. Moreover, the costs vary greatly, depending on the countries concerned along the routes.

Several subjects are considered in two or more places, and sometimes opinions expressed are contradictory. Thus, in considering whether aircrew who suffer from diabetes mellitus should be permitted to fly operationally, the author states on page 243, "An airman with diabetes mellitus is considered a hazard and should be disqualified from operating aircraft," whereas on page 265 he says, "Pilots suffering from diabetes should not be allowed to fly if they require insulin to control the disease." The latter view is contrary to the medical requirements as laid down by the International Civil Aviation Organization, which clearly state, "Proven cases of diabetes mellitus should be assessed as permanently unfit." This requirement applies to all licensed aircrew—pilots, navigators, engineers, and radio officers. Again, in discussing the important subject of antimalarial drugs for prophylaxis, there is a vague statement in Chapter 13 that "Chloroquine and Paludrine, developed during the war, may have several advantages over Atabrine," despite the opinion, expressed in Chapter 5, which reads as follows: "Paludrine is a widely used antimalarial drug. It has been used with good results and does not produce disturbing side effects or a discoloration of the skin. It is effective

both as a prophylactic and as a means of attenuating the disease. For these various reasons, aircrews are more inclined to follow out the instructions for using it prophylactically on entering malarial areas." Incidentally, although there are 103 bibliographical references to Chapter 5, there is no reference to the classic wartime researches of Hamilton Fairley, which clearly showed the value of paludrine (proguanil) as an antimalarial.

Anyone reading the sections on tropical medicine would not be made aware of the part played by European workers in this field, especially in Africa and Asia, to which so much reference is made. The Belgian, British, Dutch, French, German, and Italian schools of tropical medicine have contributed so much to the elucidation of problems of aetiology, prevention, and treatment of tropical diseases that due credit should have been given to their work. This failure to refer to important findings of pioneers in aviation medicine occurs in other sections. For instance, in discussing the pre-war researches into psychological selection tests for aircrew, no reference is made to the work of Bartlett and his colleagues or to the valuable sensori-motor apparatus to test co-ordination of limbs and eyes which was developed and assessed by Schuster and Williams. Further, there is no reference to Treadgold's findings on body-build and fitness for aircrew duty, or to the pioneer and outstanding work of Clements and Livingston on the subjects of heterophoria, binocular vision, and depth perception, or to Livingston's wartime researches on, and tests for, night vision. This is the most comprehensive book available on aviation medicine as applied to commercial flying and should prove valuable as a work of reference by those engaged in airline operations. As a textbook, it is likely to be heavy going for the student.

H. E. WHITTINGHAM.

SURGERY OF THE PANCREAS

Surgery of the Pancreas. By Richard B. Cattell, M.D., and Kenneth W. Warren, M.D. (Pp. 374; 100 figures. £2 10s.) Philadelphia and London: W. B. Saunders Company, 1953.

This is one of the most important surgical works that have appeared for some time. During the past 20 years, in which the surgery of the pancreas has been developed from an occasional adventure to a reasonably safe procedure, Richard Cattell has been entrusted with the greater part of the pancreatic surgery reaching the Lahey Clinic. He has probably done more pancreatic resections, and with more success, than anybody in the world, and he writes with authority and with a commendably balanced outlook.

One hundred and two pancreatic resections have been done at the clinic, with thirteen post-operative deaths. Eighty-eight of these operations were for cancer, with twelve deaths, a mortality of 13.6%. Cattell's analysis of this experience is instructive. He finds, for instance, that painless jaundice, which is usually considered the hallmark of cancer of the head of the pancreas, is the exception rather than the rule. Jaundice was present in all but three of the resectable cases, but it was painless in 22 only; indeed, pain was the commonest symptom and usually preceded the jaundice. The marked difference in symptomatology and in ultimate prognosis between cancer arising in the parenchyma of the head and cancer arising in the ampulla is well brought out. Forty-six patients with cancer of the head underwent resection, with a mortality of 17.3%; of these, two survived five years. Thirty patients undergoing resection for cancer of the ampulla had an operative mortality of 6.6%, and, of these, fifteen are now alive, three having survived over eight years. Pancreatico-duodenectomy for cancer of the head is now only proceeded with if it is clear that the growth nowhere involves the vena cava, the portal vein, or the superior mesenteric vessels.

The book is by no means limited to a discussion on cancer. The anatomy and physiology of the pancreas, congenital malformations, acute and chronic pancreatitis, pancreatic cysts, operative and traumatic injuries, and islet-cell tumours are all discussed fully. Chapter IV, on chronic relapsing pancreatitis, has more than 50 pages and 20 illustra-

tions on this highly important topic. Relapsing pancreatitis, like hiatus hernia, is a disease that has probably been with us undiscovered for many years. With a better knowledge of its symptomatology and augmented diagnostic facilities it is being recognized with increasing frequency as responsible for pains that have hitherto defied explanation. The writing is clear. The illustrations are excellent, for they are all well reproduced, and not one is superfluous. Altogether this is an admirable book.

HENEAGE OGILVIE.

THE ENDOCRINE ANGLE

Endocrine Treatment in General Practice. Edited by Max A. Goldzieher, M.D., and Joseph W. Goldzieher, M.D. (Pp. 474. £3 3s.) New York: Springer Publishing Company, Inc. London: Lange, Maxwell and Springer, 1953.

The title of this book is well chosen, since it is indeed about general practice and is not confined to the so-called endocrine diseases. The introduction of cortisone and A.C.T.H. has led to the treatment, with varying success, of many diseases with these drugs, and most are considered in the present volume. The introduction states that the book is intended to give the reader information of the type he might wish to obtain from a consultant at the bedside. Throughout, the consultant is an endocrinologist and continually the question is answered, "What is the endocrine angle on this patient?"

There are good sections on treatment of diabetes mellitus, on male and on female hypogonadism, and on male and on female sterility. Most diseases are grouped under systems such as gastro-intestinal, central nervous, musculo-skeletal, and so on. But the continual stressing of hormone therapy leads not infrequently to a distortion of emphasis, since the endocrine aspect is sometimes slight. The advised treatment of paroxysmal tachycardias wisely avoids endocrines and follows orthodox lines. But the first sentence in the section on constipation tells us that sluggish bowels are a symptom of many endocrinopathies, of which hypothyroidism is the most common. The section on diarrhoea starts with the statement that this is one of the classical symptoms of Graves's disease. Even abdominal pain is considered from the endocrine viewpoint, although we are warned that all possible organic causes should first be eliminated. Abdominal pain is common in the hypogonadal woman, in whom it is often of neurotic origin. But it may apparently also be due to hypocalcaemic hyperphosphataemia. The general clinician is not told how to deal with this abnormality.

The book yet contains a large amount of information. The authors are very enthusiastic about hormones and give much sound advice on prescribing them. Perhaps it is a pity there are no references. One would like to know, for instance, the evidence for advising cortisone in cases of high altitude sickness. The book will be welcomed by makers of endocrine products, but we hope that general practitioners do not often ask themselves the question, "How can I treat all my patients with endocrine drugs?" But that is the question the book tries hard to answer.

C. L. COPE.

PSYCHOLOGY OF CHILDREN

Childhood and Society. By Erik H. Erikson. (Pp. 398. £1 5s.) London: Imago Publishing Co. 1951.

Here is that rare thing, an American non-medical psychoanalyst. The author comes to psychology from art, and so (as he says) he bases his work "on representative description rather than on theoretic argument." This leads him to some reformulations of theory (infantile sexuality, the "eight stages of man") in a way that is interesting yet not compelling. One does not feel like learning or teaching his way of thinking, but nevertheless feels stimulated by a fresh presentation. The rest of the book makes the reader get to like the man and his clinical approach. The main theme is the interrelationship of individual emotional

development and the patterns of society in which the child grows up. The argument is developed without loss of respect for the individual's own developmental process.

The author has been sensitively in touch with various social groups. Two are contrasted: the Oglala sub-tribe of the Sioux, who live in the Pine Ridge Indian Reservation, South Dakota, and the Yurok, a tribe of fishermen and acorn gatherers on the Pacific coast. Here is good clinical material which adds on well to the descriptions of ordinary neurotic and psychotic children with which the study starts.

Erikson has much that is important to say about ego development. He discusses at length toys and the playing of children. About the causation of psychosis he remarks (p. 181): "The truism that the original problem is to be found in the mother-child relationship holds only in so far as one considers this relationship an emotional pooling . . . the primary deficiency in 'sending power' was in the child." This is a good way of putting the matter, but the reviewer has held the view that the original deficiency was usually in the total mothering-system, if not in the mother herself, and in the initiation of the presentation to the new individual of external reality. Both extremes must be allowed for, as well as an admixture of the two.

The book ends with studies of the childhood of Hitler and of Maxim Gorky. Surely this book justifies the training of some psychoanalysts from non-medical fields of study and experience, as is the practice in this country.

D. W. WINNICOTT.

ISOTOPES IN BIOCHEMISTRY

Isotopic Tracers in Biochemistry and Physiology. By Jacob Sacks, Ph.D., M.D. (Pp. 383. £3 8s.) New York and London: McGraw-Hill Book Company, 1953.

As a survey of the investigation of metabolic processes by means of isotopes, Dr. Sacks's book is of very considerable value and would be important if only for its bibliography, which contains about 700 references, mainly covering the period until 1950 but with some 120 of subsequent dates. Throughout this major biochemical section of his book Dr. Sacks is concerned to discuss how far the isotope techniques are valid or crucial, or are alternative or inferior to other procedures. His analysis of these points and of general principles is consistently critical and penetrating; and his writing is lucid, compact, and comprehensive in his surveys of carbohydrate, lipid, protein, and steroid metabolism. The introductory sections on physical measurement are useful, although that on the safe handling of radio-isotopes is somewhat unreal. Good descriptions are also given of problems of diffusion, calcification, and blood formation.

As the title indicates, this book is not primarily concerned with clinical applications, and it is perhaps unfortunate that authors still attempt to cover so many aspects of isotope work in books on any one field of application. Certain clinical uses are discussed here, but the opinions that the author expresses on their application are often slight and potentially misleading. I have the impression that the author is taking too great care to avoid any overstatement of the value of isotopes; and it is understandable that he should sometimes seem too disparaging. These defects, however, are incidental to the declared purpose of the book, to "discuss the principles involved in the use of isotopic tracers and . . . some of the limitations inherent in their use," and this has been thoroughly well and carefully done, and amply illustrated.

E. E. POCHIN.

A second edition has recently been issued of the *Textbook of Physiology and Biochemistry* by Professors G. H. Bell, J. N. Davidson, and H. Scarborough (E. & S. Livingstone, 50s.). Dr. Bruce Williamson's *Handbook on Diseases of Children* has been thoroughly revised for the seventh edition (E. & S. Livingstone, 21s.). Much new material has been added to Professor Boyd's *Textbook of Pathology* for the sixth edition (Henry Kimpton, 88s.), and several sections have been wholly rewritten.

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THE PREVENTION OF INFLUENZA

Since the first isolation of influenza virus in 1933 many attempts have been made in this country and in the United States to make vaccines giving satisfactory protection against the disease. The results of the early trials of these vaccines were contradictory: a vaccine might afford good protection in one epidemic and yet prove almost valueless in the next. It is now believed that the inconsistent results were mainly due to two factors—lack of knowledge about variations in virus strains and lack of adequate control of the field trials. Until recently the available laboratory methods for the study of the antigenic nature of influenza viruses seemed to show that the virus produced a succession of mutants with new antigenic characters which enabled them to overcome immunity remaining in the population from previous epidemics. With the development of new techniques for the preparation of strain-specific sera an alternative concept of the nature of antigenic variation in the influenza virus has been gaining ground. When the Section of Epidemiology and Preventive Medicine discussed this subject last week at the Royal Society of Medicine, Professor T. Francis, jun., of Ann Arbor, described some of the results of work in his laboratory with absorbed sera. He believes his findings support the theory that the influenza virus antigens are finite in number and that strain differences may be due to variations such as in arrangement or quantity of these antigens rather than to the sudden appearance of completely new antigens. This work is still in an early stage, but if the concept remains acceptable it offers great promise for the future of influenza vaccines.

The second defect of some early vaccine trials was lack of adequate control, and in the opening pages of this issue the first report of the Medical Research Council's Committee on Clinical Trials of Influenza Vaccine is published. During the winter of 1951–2 the committee set up a preliminary trial to obtain serological evidence about the effect of a number of vaccines, and to provide experience in the methods for recording illness. This was followed by a carefully controlled trial of a suitable vaccine during last winter. Some 12,000 volunteers in centres scattered throughout the British Isles and representing several

different groups in the population were inoculated with either an influenza vaccine or a control bacterial vaccine. Care was taken to ensure random distribution of the vaccines, and the observers recording illness did not know which vaccine was received by individual subjects. Any difference between the vaccine and control groups could therefore be assumed to be the result of the vaccine. There was a significant reduction of influenzal illness in the group receiving the influenza vaccine, but no great difference between the groups in the incidence of other respiratory illness—a finding which confirms the belief that the groups were alike in every respect except for the vaccine. There seems little room for doubt that the reduction in influenzal illness among the volunteers who had been inoculated with the influenza vaccine was the direct result of the vaccine.

Many general practitioners will be surprised at the low incidence of influenza among the volunteers in the control groups, and it is possible that the criteria for diagnosis were too strict. Influenzal illness during the past winter was remarkably mild compared with that in many previous influenza A epidemics, and it may have been that a large proportion of sufferers continued at work and thus escaped the suspicion of infection. The report from the Public Health Laboratory Service published elsewhere in this issue shows that the epidemic of influenza A may not have reached many trial centres till almost three months after the vaccines had been administered, and experience suggests that the protective effect of the vaccine may have fallen considerably during the interval. The low incidence of illness and the generally long interval before volunteers were exposed to risk of infection were unfortunate from the point of view of those who designed the trial, but could hardly have been allowed for. In these difficult circumstances a 40% reduction in illness in the group receiving influenza vaccine must be considered a reasonably satisfactory result.

At the Royal Society of Medicine discussion last week one speaker expressed doubts about the application of serological methods to the assessment of a vaccine, and it is probably wise to make the assessment clinically at present. But full use of the laboratory can be made both for the control of variations in clinical diagnosis between different observers and different centres, the non-vaccinated group being used for this purpose, and as a means for excluding other known diseases which might in both the control and vaccine groups give rise to clinical signs and symptoms resembling those of influenza A. Epidemics of influenza A are generally fairly sharply defined in time, and exclusion of cases outside the epidemic period would probably prevent a certain

amount of dilution of the figures due to erroneous diagnoses occurring during the non-epidemic period.

Information about the presence of influenza virus A infections during the trial period was largely provided by the laboratories of the Public Health Laboratory Service, whose staff, as can be seen from the reported printed at page 1178, worked closely with clinicians and medical officers of health. Particular credit must be given to the general practitioner "spotters," who must have found it difficult to observe the exacting precautions necessary in obtaining specimens for virus tests. In previous years detailed epidemiological conclusions on the origin and course of epidemics in this country have necessarily been somewhat speculative, because of the lack of laboratory information. This lack of information was particularly unfortunate in 1951, when viruses of two different groups were present and probably caused illnesses with different degrees of severity. The figures of the Ministry of National Insurance and Pensions provide an accurate measure of the spread and extent of influenzal infections, but without support from the laboratory these figures lose much of their value from the epidemiological point of view.

Many of the problems of influenza epidemiology will probably remain unsolved until much more detailed information of the type collected by the Public Health Laboratory Service has been accumulated and correlated with information from other sources. An alternative approach to the epidemiology of influenza was described by Professor C. H. Stuart-Harris at the meeting of the Royal Society of Medicine already mentioned. He tested sera which had been collected for other purposes for their content of antibody to influenza virus soluble antigens, and showed the value of this method in tracing the appearance and progress of the virus in a community. This method might avoid some of the inevitable defects of an investigation such as that conducted by the Public Health Laboratory Service, but to provide useful information many specimens of sera would need to be tested. None of the methods used at present for the study of influenza epidemiology can give the whole picture, which is likely to emerge only when every source of information is used to the best advantage.

ACCIDENTAL POISONING OF CHILDREN

The accidental poisoning of children seems to be increasing in frequency, and, since most of the poisons are medicines of various kinds, these accidents are of particular interest to doctors. In England and Wales the age at which accidental poisoning is commonest is 1–2 years. In 1950 and 1951 combined there were

53 deaths from that cause among these young children. The number is not large, but it is not far short of the 58 deaths due to influenza (including influenzal pneumonia), and 1951 was an epidemic year for that disease. J. O. Craig and M. S. Fraser have recently investigated¹ the accidental poisoning of children in Scotland, and they found that among children attending two Scottish hospitals accidental poisoning has become much more frequent in the last twenty years. The evidence was not conclusive that this corresponds with a true increase of cases in the child population, but there seems to be no doubt of a sharp increase in the frequency of cases there since 1948. Evidence from Manchester affords some confirmation of the trend.² Discussing the registered deaths from this cause in England and Wales of children aged 1–4, D. Swinscow³ found no increase in frequency between 1931 and 1949, but he pointed out at the Annual Meeting of the B.M.A. this year, by which time later figures had become available, that the death rate showed a steady and notable inclination upwards from 1949 to 1951. The rise was particularly sharp when the death rate from medicaments was separated from that for all poisons, for the death rate from non-medical poisons had declined somewhat.

The proportion of these deaths in England and Wales that are caused by medicaments as opposed to household and miscellaneous poisons has always been considerable and seems to be rising. In 1931–9 it was 52%; in 1940–9 it was 62%; and in 1950–1, the last years for which figures have been published, it was 80%. In the Scottish cases Craig and Fraser found that those due to medicines had recently increased much more than those due to household poisons. After allowance is made for the different ways in which these figures were obtained and categorized, it remains fairly certain that they signify an increase in the last few years—and one that seems likely to be continuing—of the frequency of cases and deaths due to accidental poisoning by medicaments in Britain.

When the drugs and other medicaments causing these deaths are looked at, they are at first sight rather surprising in that most of them are usually considered to be fairly harmless. This is because it is their effect on the adult, not on the child, that is usually thought of. The dangers of ferrous sulphate have now achieved some publicity, and Dr. F. G. M. Ross adds to it by reporting at p. 1200 of this week's *Journal* the death of a 17-months-old boy as the result of pyloric stenosis and gastric stricture. The child

¹ *Arch. Dis. Childh.*, 1953, 28, 259.² Holzel, A., and James, T., *Med. Offr.*, 1951, 86, 169.³ *Arch. Dis. Childh.*, 1953, 28, 26.

swallowed only 6-12 tablets of ferrous sulphate, and vomited soon afterwards, but the tablets did serious and ultimately fatal damage to the stomach. Yet, even though deaths from this poison have been fairly well known for some years, ferrous sulphate caused the deaths of 17 children aged 1-4 in England and Wales in 1950-1. The antihistamines are now rapidly coming to the fore; they caused in this age group one death in 1948 (the first), four in 1949, six in 1950, and eight in 1951. Preparations of strychnine are also frequent causes of death, though it is not thought of as a dangerous poison because it is usually prescribed in small doses in tonics or, more rarely, laxative pills, neither of which types of preparation is handled in the home with much restraint. Aspirin has always been quite a common cause of poisoning in children, and methyl salicylate in liniments has been a serious danger in the past, though less so now.

In the prevention of these deaths the family doctor has an important part to play in warning parents about the dangers to their children of even apparently harmless preparations. Chemists, too, and other vendors of common poisons have a duty to their customers. There is also a strong case for legislation to compel the labelling of all these preparations as poisons, for that is what they are. These are preventive measures that could be taken in the light of what is now known about these deaths, but more needs to be discovered yet. In particular, the increasing frequency since 1948 is no doubt more difficult to explain than merely by pointing out that the Health Service began then. One effect of the Health Service seems to have been to bring medicaments into more homes than ever before, thus increasing the risk to children, and possibly larger quantities are prescribed than formerly, so that more is left over to lie around in the house. It is notable, for instance, that in all these years only one child in this age group died in England and Wales from a sulphonamide. One reason for this may well be that sulphonamide tablets are usually prescribed in fairly small numbers with the intention that they shall be taken in a specified course. Craig and Fraser show that tablets are a commoner cause of poisoning than liquids, and they are certainly more often prescribed than formerly, though not enough to account for the sharp rise in cases and deaths. We are still ignorant of some of the causes of these deaths, but this work does indicate the need for at least advice from doctors and sellers of poisons, and perhaps in addition the compulsory labelling as poisons of many common household remedies.

AGE AND WORK

While most people of working age still feel an obligation to care for their own children, many of them no longer feel obliged to support their blood relations at the other end of life's span. Aged parents and grandparents are left to fend for themselves in a manner that would have been thought shockingly callous 50 years ago, and probably few of its readers saw anything to question in a newspaper headline¹ that appeared last week—"Neglect of the Aged Sick: Welfare State Fails." The effects of this social trend, which seems to be increasing rather than diminishing, are exacerbated by that now well-known demographic change—the increase year by year of the proportion of old people in the population. In a paper appearing at p. 1190 of this week's *Journal* Dr. W. P. D. Logan discusses some of the population changes to be expected and in particular the occupational distribution of old people. At the outset he dispels a rather widespread misconception; it is that people are living to a much greater age than formerly, and it is even sometimes tendentiously expressed as a criticism of medical science for prolonging into a miserable senility the lives of people who would prefer to shuffle off this mortal coil. In fact, however, the expectation of life of a person aged 60 has hardly changed in the last 100 years. It is the expectation of life of young people that has so greatly increased, with the result that many more than formerly now reach the age of 60; but, having reached it, they will on average live only a year or two longer than their great-grandfathers.

It seems to be generally believed that men can work to a greater age in skilled occupations than in unskilled, and in light occupations than in heavy. Though this may be true in some respects, Dr. I. M. Richardson shows in an important contribution² that there is a considerable drift from skilled to unskilled work among older people, which sharply accelerates when the 40s are left behind. Though skill may sometimes diminish with age, its reduction does not seem to be a main cause of this drift. Rather do ageing people find their chief difficulty in responding quickly, and what often causes them more trouble than the physical exertion or the skill required to perform the job is the pressure of keeping up with the conveyor belt. Allowed to complete the task in their own time, they can carry it out with unimpaired skill. Again, there is nothing to be said for the common practice of looking on old people merely as retaining some of their faculties while others are gradually being dimmed. As Mr. A. T. Welford says in an article published at p. 1193 this week, while most of our scientific knowledge about ageing is of ways in which capacity and performance get worse with age, there are clearly ways in which age brings improvement, "such as steadiness of character, conscientiousness, and patience." These qualities have not yet proved

¹ *Manchester Guardian*, November 20.

² *Brit. J. Industr. Med.*, 1953, 10, 269.

³ *National Advisory Committee on the Employment of Older Men and Women: First Report*. H.M.S.O. 1953.

to be amenable to scientific investigation, even though they are often apparent to good employers, but the inability to enumerate and measure them is no excuse for ignoring them.

At the opening of his study of the health of middle-aged and elderly people at work, Richardson refers in passing to the adage that occupation is the best medicine. This is most dramatically seen to be true when the age incidence and causes of suicide are examined. The average age at which suicide is committed has been rising in Britain since 1900, so that it has been becoming increasingly a disorder of elderly people; and Dr. I. R. C. Batchelor and Miss Margaret B. Napier conclude in an article appearing at p. 1186 that of outstanding importance among the causes of these suicides is a community attitude making the old person feel useless and unwanted. The people they studied commonly complained of feeling lonely, and these writers emphasize the need for people to continue an occupation for as long as possible, and to develop other interests too, so that they may continue to be a part of the community. But it seems to be rather important here to distinguish the economic from the therapeutic reasons for staying at work, for many ageing people look forward with a lively pleasure to retirement so that they can at last occupy themselves with something worth while. The right approach was taken in the recent report³ of a committee appointed by the Minister of Labour when it recommended that people who can give effective service should have the opportunity to continue in work. The widespread desire to find ways and means of keeping old people employed is understandable in view of the rapidly mounting bill for old-age pensions—£238m. in 1948 to £501m. in 1978 at present rates—and the report points out that, if the skill of older people can be more fully used, the standard of living will be higher. But, when all is said and done, to anyone not wholly lapped in the Welfare State there must seem something incongruous in a generation which, ever demanding shorter hours of work, asks for its fathers' working days to be extended.

RESEARCH IN GENERAL PRACTICE

Research work under the conditions which obtain in most general practices can never be easy. It requires not only the impulse to continue routine work when the armchair beckons and the glass of sherry is waiting but also the capacity to pursue an objective which is unrelated to the demands of the daily round. It implies therefore not only unremitting industry but also the organization of the working day to give time for constructive thinking; more work on the one hand and more leisure on the other, and the family doctor may be pardoned for concluding that there never was a prescription more compounded of incompatibles. And yet this stimulus to the general practitioner to engage in research has come from his fellows and from others who sincerely wish him well. The inspiration for this movement towards research springs from two sources.

The first is the recognition that there is an army of potential field-workers, as yet unengaged, who should be studying disease not only in the individual but also in the community. The second is the appreciation that such work would encourage some good doctors who have experienced frustration, resentment, and inferiority in general practice, especially those who work in the large towns and cities. The opportunity is undeniable, but the difficulties are great.

The College of General Practitioners has accepted the organization of general-practitioner research as one of its most important functions, and it has issued a first report in the form of a "Research Newsletter."¹ A research committee has been formed and a research register has been opened. A number of distinguished experts have agreed to serve on a panel which is prepared to advise individual general practitioners on the practicability of their research projects and the best method of conducting their investigations. At the first annual general meeting of the College on November 14 Dr. G. F. Abercrombie described the research committee's programme and mentioned² some of the investigations which were already under way. Members who are essaying a common task will be introduced to each other so that the available clinical opportunities will be multiplied and the individual will have the stimulus of working in a team.

The intention of the College is not to direct and control such research but to support and assist it by all possible means. The most fruitful research is done by men who are pursuing their own ideas—and also the most sterile. The rare men of genius, like Mackenzie and Pickles, will pursue their pioneering path alone, but the rest of us must be grateful for friendly counsel. Research is one of the few great words in science, and we must be careful not to debase our limited coinage. The family doctor is more likely to err on the side of humility than of arrogance, and yet his work, even if humilitarian and inconclusive, can bring him personal satisfactions akin to those experienced by Harvey, by Bernard, and by Pasteur.

The research methods employed by family doctors must be historical, observational, and statistical; experimental procedures will usually not be accessible to them. Investigations must necessarily be concerned with the common disorders such as cancer, cardiovascular diseases, and even in these common illnesses a combined study by a group of practitioners will be required if results of value are to be obtained. A small group of doctors working happily together and looking after a compact community of 20,000 people could, in the space of a few years, write anew the natural history of some virus diseases. How fascinating it would be to learn the course of herpes zoster in such a township—the incidence, the age groups, the nerves involved, the relationship to varicella, and the precipitating factors. General practitioners are likely to be the first to observe the ill effects of a new drug, and it is hoped

¹ *Practitioner*, 1953, 171, 307.

² *British Medical Journal*, 1953, 2, 1154.

thetic plastics, including methyl methacrylate polymers, have been considered¹² as alternatives to cartilage. The physical properties of these materials can be readily controlled, and, once their biological "inertness" has been established, they would appear to offer many advantages.

MONKEY BUSINESS

The recent commotion in the daily press about the famous Piltdown remains was the sequel to an article¹ in the latest *Bulletin* of the British Museum (Natural History), the authors of which show beyond reasonable doubt that the Piltdown mandible and canine tooth are not genuinely fossil, but must be forgeries perpetrated about 1912-13 by some person unknown. The original cranial fragments are at the same time proved to be genuine, and possibly of Upper Pleistocene date.

The truth about the hoax, which seems likely to have been originally aimed solely at Charles Dawson, the finder of the Piltdown man, may never be known. Possibly its perpetrator intended at first to reveal the fraud after a short interval, but later, when even the experts accepted the specimens as genuine, took fright and dared not face what would have been the justifiable wrath of so many great men. However that may be, students of human pre-history feel a sense of relief that at long last an acceptable explanation has been found for the manifold problems raised by the Piltdown finds. No anatomist or palaeontologist to-day could regard without qualms a fossil man with a *Homo sapiens* cranium and the mandible of an ape. The usual refuge of the doubters—and they were many—has been to dissociate the jaw from the skull and thereby to evoke a fossil ape as well as the undoubted fossil man. This device did not recommend itself to palaeontologists and geologists in general, for fossil apes are unknown in Western Europe since the Lower Pliocene, perhaps 10 million years ago. The most recent opinion dates the Piltdown gravels to the last Interglacial, between 190,000 and 115,000 years ago. Unfortunately nobody followed up a clue that Waterston almost stumbled on a year after the discovery of the remains. He superimposed tracings taken from radiographs of the Piltdown mandible and of a modern chimpanzee's, showing that they were an almost perfect fit; and he concluded that it was as inconsequent "to refer the mandible and cranium to the same individual as it would be to articulate a chimpanzee foot with the bones of an essentially human thigh and leg."²

That acquired immunity of the host is responsible for the increasingly rapid breakdown of successive foreign transplants was noted by Gibson and Medawar⁹ in a clinical study of skin grafts. It was further demonstrated by Medawar's experimental work¹⁰ on skin transplantation in the rabbit, and more recently by Dempster's experimental studies¹¹ on skin and kidney transplantation. Gibson and Davis¹ report a similar increase in the speed of absorption of successive bovine cartilage implants, and they ascribe this, too, to immune factors.

Having at last disposed of the need to find a fitting evolutionary niche for an apparently important, but now the less incongruous, *Eoanthropus dawsoni*, we may now come into her again. The young lady of Swanscombe comes into her own as the undoubted earliest known human inhabitant of these islands, about 250,000 years old. Many have felt since her discovery in 1933 that the title was hers by right, but for others the Piltdown man has hitherto presented a bar to her succession.

- 1 *Brit. J. plast. Surg.*, 1953, 6, 4.
- 2 *Ibid.*, 1953, 6, 26.
- 3 *Laryngoscope* (St. Louis), 1933, 43, 976.
- 4 *Lancet*, 1947, 2, 389.
- 5 *Brit. J. plast. Surg.*, 1951, 4, 63.
- 6 *Plast. reconstr. Surg.*, 1951, 7, 96.
- 7 *Surg. Gynec. Obstet.*, 1953, 96, 493.
- 8 Goldman, I. B. *J. Mt Sinai Hosp.*, 1950
- 9 *J. Anat.*, 1943, 77, 299.
- 10 *Ibid.*, 1944, 78, 176.
- 11 *British Medical Journal*, 1951, 2, 1041.
- 12 Hoyt, J. A. B., and Lloyd, R. S., *Arch. O*

BY

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This paper is intended to describe as fully as possible, but without unnecessary elaboration, the procedure to be adopted in the examination of urine under the conditions normally present in the surgery. The tests chosen are those considered to be the most informative and selective. Practically all the tests are qualitative and they are often described as simple, but it is important to realize that this is no reason for doing it in a careless or haphazard manner. Experience will soon show that a test done with care gives a result which so far as the test goes is satisfactory; whereas a test made without such care often gives a result which leaves the practitioner in doubt, and he then embarks on a series of repeat or confirmatory tests, wasting time and destroying his confidence in the original test. This means that without necessarily employing precise measurements it is essential to keep as closely as possible to the prescribed quantities and conditions.

Necessary Apparatus and Reagents

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Apparatus.—Tapered urine glass to hold about 6 fl. oz. (170 ml.); a microscope having $\frac{3}{4}$ -in. and $\frac{1}{2}$ -in. (1.7-cm. and 0.4-cm.) objectives; a supply of glass slides and cover slips; dropping pipettes with rubber teats; a small electric or hand centrifuge carrying 10-ml. tapered glass centrifuge tubes is a great asset but not absolutely necessary; urinometer reading from S.G. 1000 to 1060; a plentiful supply of clean test-tubes 6 by $\frac{3}{4}$ in. (15 by 1.5 cm.) and a test-tube rack to hold 12 tubes; Bunsen burner or spirit lamp; simple water-bath or saucepan; tripod and wire gauze; several small glass funnels 3 in. (7.5 cm.) diameter; filter paper No. 1 Whatman 12.5 cm. diameter; litmus paper; two 25-ml. graduated glass cylinders; two beakers of 50-ml. capacity.

Reagents.—Strong hydrochloric acid; strong nitric acid; strong ammonia (0.880); acetic acid (33%); strong solution of iodine (liq. iod. fort., *B.P.*); saturated solution of ammonium oxalate; 25% solution of salicylsulphonic acid; 10% solution of barium chloride; hydrogen peroxide (20 vol.); 10% solution of ferric chloride; 3% solution of silver nitrate; absolute alcohol or industrial methylated spirit; Benedict's qualitative reagent; Fouchet's reagent (this is made by dissolving 25 g. of trichloroacetic acid in 100 ml. of water and adding 10 ml. of 10% ferric chloride solution); 5% alcoholic pyrimidone; chloroform; zinc acetate in powder; sodium nitroprusside crystals; ammonium sulphate crystals.

Nature of the Specimen

Nature of the Specimen

It is important, particularly when testing for reducing substances, to know the time of the passing of the specimen in relation to the previous meal. The specific gravity of a urine will be influenced by marked variation in the fluid intake prior to the passing of the specimen. Traces of protein and increased cell content have a quite different significance in a fresh specimen passed in the surgery by a male patient from that of a specimen passed by a female patient, because the latter may have been contaminated by vaginal secretion. For most chemical examinations a fresh specimen is all that is necessary, but in the case of suspected haematuria, proteinuria, or infection it may be necessary to get a catheter specimen from a female patient.

Appearance and Colour.—Normal urine is of a straw colour which may be pale or dark merely because of variation in concentration. It is quite clear apart from an occasional cloud of mucus. Any turbidity is due to bacteria or suspended deposit which may be crystalline, amorphous, or cellular.

Reaction.—Normal urine is usually acid to litmus paper, but soon after a meal the alkaline tide may result in the production of an alkaline specimen which on standing will deposit a heavy cloud of earthy phosphates.

Specific Gravity.—In an average specimen this ranges from 1015 to 1020 and is influenced by the amount of fluid taken and by the loss of fluid by other channels than the urinary tract. The urine of a patient with chronic nephritis shows a more or less fixed low specific gravity, and limitation of fluid does not raise it appreciably. A specific gravity in the region of 1030 or over is usually due to the presence of sugar.

Deposit.—To the naked eye normal urine shows no appreciable deposit. Concentrated urines may show a deposit of urates, usually coloured pink, or a "Cayenne pepper" deposit of uric acid. The urates will dissolve immediately on warming the urine to about 60° C. Excess oxalates in a specimen of urine are usually recognized by microscopy; they appear in both acid and alkaline urine. Alkaline urines will usually have a phosphatic deposit readily soluble in a little acetic acid. Urates may also be deposited in a concentrated alkaline specimen.

Microscopical Examination of the Deposit

About 10 ml. of urine (which should be as fresh as possible) is centrifuged for 10 minutes at about 2,000 rev. per minute, and after removal of the supernatant fluid by decantation a drop of the fluid from the bottom of the tube, taken by a dropping pipette and teat, is transferred to a glass slide and covered with a coverslip. If a centrifuge is not available the urine should be allowed to stand for two to three hours in a tapered urine glass and a little of the deposit removed by a pipette and teat. Description of the cellular elements, casts, and crystals is usually of little help and it is best to learn to recognize them by practice on known specimens and comparison with the diagrams in textbooks of pathology. Apart from a marked excess of oxalates or uric acid the only crystals of importance are those of cystine; they are colourless, regular hexagonal plates, readily soluble in ammonia and hydrochloric acid but insoluble in acetic acid. Calcium oxalate crystals are envelope-shaped and are insoluble in acetic acid but soluble in hydrochloric acid. Uric acid crystals have always a red or brown colour and are insoluble in hydrochloric acid but soluble in solution of lithium or sodium carbonate. The commonest artifacts resembling cystine are maize-starch grains from dusting powders; these are readily recognized by their blue or black colour on the addition of solution of iodine.

Protein

Normal urine contains no proteins except a trace of mucin. Pathological proteinuria may be due to the presence of albumin, globulin, haemoglobin, methaemoglobin, or Bence Jones protein. As the tests depend on the appearance of a turbidity or precipitate, it is essential that the specimen should be filtered if it is not already clear. If the urine cannot be rendered completely clear, then some of the filtered specimen should always be used as a control to compare with the turbidity of the tested fraction.

¹ Weiner, J. S., Oakley, K. P., and Le Gros Clark, W. E., *Bull. Brit. Mus. (Nat. Hist.)*, 1953, **2**, 141.
² Waterston, D., *Nature*, 1913, **92**, 319.
³ Oakley, K. P., *Proc. geol. Ass.*, 1952, **63**, 271.

Boiling Test.—For this test the urine should be acid to litmus; if not, it should be made so by the addition of just sufficient acetic acid. Boiling an alkaline urine containing protein may convert the latter into alkaline metaprotein; this does not coagulate and on the subsequent addition of acetic acid it becomes acid metaprotein, also in solution, and a false-negative result is obtained. Take about 10 ml. of urine in a test-tube and, holding the bottom with the first finger and thumb, boil the upper third. A cloud or precipitate may be due to protein or the appearance of earthy phosphates owing to the loss of carbon dioxide rendering the urine alkaline. Add two or three drops of 33% acetic acid. Phosphates will disappear, but the protein turbidity will remain and may become more intense. If on heating a cloud appears well below the boiling point and disappears partially or wholly on further heating and then reappears on cooling, Bence Jones protein is present. The boiling test is sensitive and reliable if the urine is clear and acid before the test is made.

Salicylsulphonic Acid Test.—To about 5 ml. of urine in a test-tube add 10 drops of 25% salicylsulphonic acid. The presence of protein is shown by a turbidity or precipitate. This is a useful test, as the original reaction of the urine does not matter. It has the disadvantage that it will not discriminate between Bence Jones protein and other proteins, and it is possible to get a false-positive reaction with urines containing iodoxy after pyelography.

Blood

A chemical test for blood will indicate haemoglobin and its iron-containing derivatives such as methaemoglobin. To about 5 ml. of urine add three or four drops of 33% acetic acid and about one-fifth of its volume of solution of pyrimidone in alcohol, pouring the latter down the slanted test-tube so that it forms a layer above the urine. Add four or five drops of hydrogen peroxide (20 vol.) so that it causes a disturbance at the junction of the liquids. A positive result is shown by the immediate development of a mauve colour at the junction of the liquids spreading up into the alcoholic layer. The colour soon fades unless the amount of blood present is excessive. If the colour appears very slowly and increases steadily for from five to ten minutes, it is probably a false reaction due to the presence of iodides. This can be confirmed by adding about 1 ml. of strong nitric acid to about 5 ml. of urine and then adding about 1 ml. of chloroform. Any liberated iodine will dissolve in the chloroform, giving it a mauve colour. The pyrimidone test is quite sensitive but will not, of course, detect a few red blood cells such as can be seen in a microscopical examination of the deposit. It is a test for haemoglobin and will not distinguish haemoglobinuria from haematuria. Urines containing methaemoglobin will have a port wine or dark brown colour; its presence needs confirming by finding the characteristic absorption bands with a hand spectro-scope. The use of this instrument for detection of pigments in urine is well described in *Harrison's Chemical Methods in Clinical Medicine*.

Reducing Substances

In the surgery the important points are, first, is a reducing substance present? and, secondly, is it glucose? If the latter, then further tests may be necessary to establish the diagnosis of diabetes. Take 5 ml. of Benedict's reagent, measured if possible in the graduated cylinder. Place it in a test-tube and add 0.5 ml. or eight drops of urine by dropping pipette (held vertically). Mix by shaking and boil thoroughly for at least one minute, or place in a boiling-water-bath for five minutes, and allow it to stand for a few minutes. A positive result is shown by the presence of a yellow or reddish yellow precipitate. A green colour or a greenish precipitate should be ignored, as it is probably due to a concentration of normal urinary constituents. It is of the greatest importance that the quantity of urine to that of Benedict solution should not exceed 1 to 10 or many false positives will result.

As glycosuria, whatever its cause, depends upon the blood level, when the urine is collecting in the bladder it is important to know that enough carbohydrate has been taken to cause such a blood level. The actual concentration in the urine will also be influenced by the amount of fluid taken. The best time to test for glycosuria is in the first specimen passed one and a half to two hours after a fairly liberal carbohydrate meal. If a negative result is obtained it is unlikely that the patient ever passes glucose. Other reducing substances are not dependent upon the previous carbohydrate intake, and reduction may be obtained in the presence of lactose, pentoses, laevulose, and derivatives of salicylates taken in the form of aspirin, sodium salicylate, or para-aminosalicylic acid. Pentoses are of no pathological significance, but their presence inevitably gives rise to a suspicion of diabetes. They may appear after their ingestion in fruits, but occasionally persistent pentosuria, unaffected by diet, occurs as an inborn error of metabolism.

A very rare cause of reduction is due to homogentisic acid in alcaptonuria. The reduction due to pentoses is not very pronounced and will be much the same in any specimens, fasting or otherwise. Glycuronates are very rarely a real cause of difficulty and will be related to the ingestion of large amounts of some drug such as morphine, chloral, etc. In adults, lactose, except in very small amounts, is found only in the urine of nursing mothers and is specially apt to occur at the time of stopping breast-feeding. Lactose may occur in the urines of infants with gastro-intestinal disturbance; very rarely galactose is found in the urines of infants made ill by the taking of milk in any form. Laevulose is uncommon but will sometimes be found in the urine of those consuming large amounts of honey.

The commonest false positive is that due to salicylates. Its incidence bears no relation to meals. If suspected it can be recognized by adding about 10 drops of solution of ferric chloride to about 5 ml. of urine and noting the intense purple colour.

Confirmation of the presence of glucose can be made by osazone and fermentation tests, and minute traces may be detected by chromatography; but the relation of the reducing substance to meals is usually sufficient evidence on which to base the diagnosis of glycosuria.

Acetone Bodies

The acetone bodies present in urine may be acetone, diacetic acid (aceto-acetic acid), and β -hydroxy butyric acid. Qualitative tests are available only for the acetone and diacetic acid. Ketonuria is usually associated with diabetes, but it can occur in any condition in which there is deprivation of or failure to use carbohydrate. Children rapidly develop acetone bodies in the urine when carbohydrate is cut off by vomiting or fasting.

Rothera's Test.—In a test-tube place ammonium sulphate to about the 1-in. (2.5-cm.) level and add about 10 ml. of urine. Shake well until most of the ammonium sulphate has dissolved. To this add three or four drops of a fresh solution of sodium nitroprusside, made by dissolving a few crystals in about 1 in. of water in a test-tube so that a fairly deep red solution results. Then add one drop of strong ammonia and mix well. A positive result is shown by the appearance of a deep purple colour. The test is given by both acetone and diacetic acid and is extremely sensitive. Because of this sensitiveness slight colour production should be ignored, and negative results indicate that there is no degree of ketosis. If the positive reaction is marked it is as well to perform a further test with ferric chloride, which, being relatively insensitive, has a greater significance if positive.

Ferric Chloride Test.—To about 10 ml. of urine add solution of ferric chloride drop by drop, mixing well after each addition, until the precipitated ferric phosphate appears to be maximum. Filter, and if the filtrate is free from any marked reddish colour add another drop of ferric chloride. If the phosphates have not been fully precipitated a further precipitate will result and the fluid must again be run

through the filter paper. To the clear filtrate add the ferric chloride solution drop by drop and notice if a red or reddish brown colour develops. It is very important to add the ferric chloride with care as excess destroys the colour of the iron salt formed with diacetic acid: false negatives are always due to excess of reagent. Of the acetone bodies only diacetic acid gives a colour. As the test is not very sensitive a genuine positive result indicates a fairly marked degree of ketosis. Drugs such as salicylate can give an intense purple or reddish purple colour but a negative nitroprusside test. If there is any doubt about the genuine nature of a ferric chloride test, take 10 ml. of urine in a cylinder and add 10 ml. of water, transfer to a small beaker, and boil until the volume is reduced to about 10 ml. Repeat the ferric chloride test. Any diacetic acid will have been converted to acetone and driven off by the boiling and no colour will now be obtained. Drugs will not be volatile and the result will be practically the same as in unboiled urine.

Bile Pigments

Bile pigments are present in urine only in jaundice, so a patient who shows no sign of pigmentation of the sclerotics is unlikely to have bile pigment (bilirubin) in his urine. Bile pigment may cause the urine to vary in colour from orange to deep brown; occasionally on standing there is a greenish tint due to oxidation to biliverdin. A characteristic of urine containing an appreciable amount of bile pigment is that, on shaking, the froth acquires a yellow tinge. Dark urines due to concentration, urobilin, blood pigment derivatives, and drugs do not show this. The yellow colour of the froth is not easily recognized in artificial light.

Iodine Test.—To about 10 ml. of urine add about one-tenth of its volume of dilute iodine solution—that is, 1 part of liq. iod. fort. diluted with 20 parts of water. Pour the iodine slowly down the side of the slanted tube so that it forms a layer on the surface of the urine. A green ring developing at the junction of the two liquids is proof of the presence of bile pigment. This is a good but not very sensitive test.

Fouchet's Test.—For the detection of small quantities of bile pigment this test is the most reliable. To about 10 ml. of urine add about 2 ml. of 10% barium chloride solution. Mix well and filter. The precipitated barium sulphate and phosphate will absorb the bile pigments and after the filter paper has been allowed to drain it should be opened out flat on a white tile or another filter paper. Two drops of Fouchet's reagent are dropped in the centre. The presence of bile pigment is shown by the production of a green or greenish blue colour due to the oxidation of the bilirubin.

Bile Salts

The Sulphur Test.—Place about 50 ml. of clear urine in a beaker or urine glass and from a sprinkler or pepperpot sprinkle dry flowers of sulphur on to the surface. A positive result is shown by the sulphur particles streaming towards the bottom of the vessel. The beaker is best viewed by transmitted light; shaking must be avoided. This test cannot be done properly in a narrow vessel such as a test-tube. It is a sensitive test but can be given by other substances capable of lowering surface tension. Urine from a case of jaundice of some duration with much bile pigment will not necessarily show any bile salts as these are excreted only in the early days of the onset of obstructive jaundice and sometimes when a case of infective hepatitis is clearing up.

Urobilin

The presence of urobilin in the urine indicates either excessive haemolysis with excess production of the pigment or of some degree of liver damage. It is excreted partly as the colourless chromogen urobilinogen and partly as the yellow or orange pigment. On standing, urobilinogen is slowly converted to urobilin and the colour of the urine will deepen. Marked urobilinuria closely resembles the

colour of bile pigment, but the froth is not coloured on shaking and gives no reaction with iodine or Fouchet's reagent. There is no point in trying to distinguish between urobilin and urobilinogen, and the best test is Schlesinger's, which gives a reaction with either.

Schlesinger's Test.—To about 10 ml. of urine in a test-tube add two drops of liq. iod. fort. or any comparable solution of iodine; mix well. In another tube place about 1 g. of powdered zinc acetate and add about 10 ml. of absolute alcohol or industrial methylated spirit. Shake well and mix the two fluids, pouring from one tube to another several times, and then filter. A positive result is shown by a filtrate that while yellow or pinkish yellow to transmitted light will show a definite green fluorescence by reflected light. The test is best carried out in daylight. This test is sensitive, and unless the fluorescence is readily perceptible an excess of urobilin can be excluded.

Chlorides

It is sometimes important to know if a patient is excreting a reasonable amount of chloride, and this can best be ascertained by adding to about 10 ml. of urine about 1 ml. of strong nitric acid and 2 ml. of solution of silver nitrate. Normal urine should give a heavy white curdy precipitate. No precipitate or only a slight turbidity or opalescence indicates a marked chloride deficiency in that specimen.

Next article on *Clinical Pathology*.—"Infected Urine," by Dr. Cuthbert E. Dukes.

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

BUTAZOLIDIN SYMPOSIUM

CLINICAL AND EXPERIMENTAL OBSERVATIONS

A symposium on "butazolidin" (phenylbutazone) was held under the auspices of the Empire Rheumatism Council at the Royal Society of Medicine on November 13. The clinical section was under the chairmanship of Dr. W. S. C. Copeman, and Professor E. C. Dodds presided over the experimental section.

Dr. O. STEINBROCKER (New York) presented the results he and his colleagues had obtained with both short- and long-term butazolidin treatment. They found that it was a powerful analgesic, but that its antirheumatic effect, if any, was slight. They had compared the effects of intra-articular injections of butazolidin and hydrocortisone, and, although they had not observed any significant differences in the results, he was not prepared to attribute an antirheumatic action to phenylbutazone on this basis. The incidence of side-effects was 22% in the short-term therapy, and it was found that toxicity occurred in one-third of the cases on long-term treatment. At all periods administration of the drug was fraught with hazards. Dr. Steinbrocker emphasized that no serious toxic effects were encountered in the first 500 cases treated by his group, but that following this two major episodes occurred within one week. He warned against undue optimism and advised weekly analysis of urine and blood counts during the whole course of treatment.

Analgesic Action

Dr. J. P. CURRIE (Glasgow) compared the analgesic action of butazolidin with that of other analgesic antipyretics and newer analgesics. In conditions other than "rheumatism"

butazolidin was a poor analgesic, and he thought that there was some specificity for "rheumatic" pain. In a series of some 1,200 cases not only was the incidence of toxicity extremely low, but even mild side-effects were rarely seen.

It was known that toxicity was increased by the simultaneous administration of amidopyrine and barbiturates, and in Glasgow they were very careful to stop all other drugs during the administration of butazolidin. He suggested that the high incidence of toxic effects encountered by other observers might be due to the fact that phenobarbitone was so extensively used. The potency of pyrazol derivatives in relieving the symptoms of rheumatoid arthritis appeared to be proportionate to their experimental trauma-protective effect, and it was suggested that further screening of pyrazol compounds should make use of this association.

Dr. G. R. NEWNS (Sheffield) discussed the results obtained in 197 cases treated with phenylbutazone. There was sustained relief of pain in 65% of patients, but the drug did not affect the course of the rheumatoid process. Toxic effects occurred in 25% of cases, and included gastrointestinal disorders, skin rashes, agranulocytosis (with one death), and oedema. In spite of the high incidence of toxicity he considered the use of butazolidin in rheumatoid disease was justifiable and that it was particularly useful in the rehabilitation of the more long-standing cases.

Blood Concentrations and Toxicity

DRS. ENA BRUCK, M. E. FEARLEY, and R. I. MEANOCK (London) reported that the incidence of toxic effects increased considerably with increasing blood concentrations of phenylbutazone. When the blood concentration rose above 10 mg./100 ml., 85% of patients developed toxic effects, as against 37% with blood concentrations between 5 and 9 mg. and 12% between 0 and 4 mg. Maximum relief of symptoms occurred with blood concentrations between 5 and 10 mg./100 ml. Increasing the blood concentration to above 10 mg. did not produce further relief of symptoms. In view of the marked variations in absorption of the drug in different individuals they considered it was impossible to formulate a rigid dosage schedule which would prove satisfactory in the majority of patients.

The discussion was opened by Dr. F. DUDLEY-HART (London), who agreed that butazolidin was a powerful analgesic without specific antirheumatic effects. Its value, he thought, was greater in osteoarthritis than in rheumatoid arthritis and he had found it effective in Paget's disease and metastatic carcinomatosis.

Dr. JOHN GLYN said that they had treated 11 cases of rheumatic fever at the Bellevue Hospital, New York, and found that the results were comparable with those produced by salicylates. The constant and dramatic response of the joint inflammation as well as the immediate effect on pyrexia and tachycardia provided some evidence that in this condition butazolidin had more than a purely analgesic effect.

Professor R. DOMENOS (Saarbrücken) said that he and his colleagues had found that the effect of butazolidin in inhibiting formalin-induced inflammatory oedema in rats was significantly greater than that of A.C.T.H. or cortisone. They were unable to demonstrate any correlation between the adrenal ascorbic-acid-depleting effect of various drugs, including phenylbutazone, and their anti-inflammatory effect. He considered this lack of correlation indicated that butazolidin did not act via the pituitary-adrenal axis. Experiments in rats showed that the effects of phenylbutazone were not influenced by adrenalectomy and that renal excretion of various substances, including P.A.S. and penicillin, was appreciably delayed by butazolidin.

Dr. R. M. MASON (London) presented observations he had made on uric acid metabolism in four patients with gout and one patient with Paget's disease who was treated as a control. These patients took 600 mg. of butazolidin daily by mouth, and in all but one, who developed congestive heart failure, there was a persistent though slight in-

crease in uric acid excretion and a corresponding fall in blood levels. He believed that the explanation for the differing results reported by other observers lay in the variable preponderance of water-retaining and uricosuric effects in individual patients.

Effect on Clotting Time

Dr. J. G. HUMBLE (Westminster Hospital) reported that in 44 patients treated with butazolidin the clotting time was significantly increased in six cases and in 14 cases the prothrombin times were prolonged. Experiments showed that butazolidin plasma would correct the deficit in "tromexan" plasma and in "aged" normal plasma. It would not correct that in patients suffering from liver disease and obstructive jaundice. He considered, therefore, that the cause of the clotting effect was due to deficiency of prothrombin. This was confirmed by the two-stage prothrombin assay. The oral administration of vitamin K₁ resulted in a prompt return to normal of both prothrombin and clotting times.

DRS. A. HILL and M. S. GOOD (Aylesbury) had studied the effect of butazolidin on C-reactive protein, but the number of cases was too small to enable them to reach any definite conclusions. Their preliminary observations, however, led them to believe that further studies in this field would be amply justified.

Dr. P. O. WILLIAMS (London) reported that butazolidin caused retention of sodium and water during the first few days of treatment, but with continued administration of the drug both water and salt excretion returned to normal. In 13 patients who developed oedema while on treatment with butazolidin all except one had some demonstrable cardiac or renal lesion. He suggested, therefore, that oedema did not develop during therapy unless there was some other pre-existing defect in the control of salt-and-water balance. Since oedema occurred only under these circumstances he did not favour the routine prescription of the low sodium diet. When oedema does develop it should be regarded as more than a simple side-effect of the drug.

SIR RICKARD CHRISTOPHERS, 80

One of the leading malariologists of the century, Sir Rickard Christophers, celebrated his eightieth birthday this week (on November 27). Colleagues who have worked with him in recent years may find it hard to believe that he is anything like that age, though anyone familiar with the extent of his work—work still in progress, needless to say—will wonder how one man can have found time to accomplish so much. He graduated in medicine in 1896, and his first contact with the disease with which his name will always be associated was in 1898, when with J. W. W. Stephens and C. W. Daniels he was appointed a member of the Malaria Commission of the Royal Society. The investigations conducted in 1899–1900 by the Commission in Central and West Africa laid the foundation of the study of malarial epidemiology. For the first time the conceptions of endemicity in malaria as now understood were set out, and for the first time the principle of segregation of the susceptible immigrant from indigenous infection was laid down as a major antimalarial measure. The connexion between blackwater fever and malignant tertian malaria was also established.

A year or two later Christophers and Stephens carried out researches in India which had a profound effect on the future of malariology in that country, for they stimulated general interest in the study of malaria problems. One important discovery was that different species of anophelids are very selective in their choice of breeding-place and vary widely in their capacity for transmitting malaria—the foundation of the modern concept of species sanitation. Christophers entered the Indian Medical Service in 1902, and during the next few years he was busy studying the life cycle of

Nov. 28, 1953

SIR RICKARD CHRISTOPHERS, 80

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Correspondence

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

Seven Insulins in Britain

SIR,—Since Monday, November 16, seven insulin preparations are available on the British market, three old and four completely new, to the medical profession and the diabetics of this country. The whole question of these new insulins was discussed by interested doctors at the annual meeting of the Diabetic Association last July, and it was felt most strongly that the introduction of all these little-known new preparations at once would be most confusing to doctors and hence even dangerous to patients. It was unanimously agreed to advise the authorities that it should be introduced first. This opinion was immediately forwarded both to the Ministry of Health and to the British Insulin Manufacturers. Events have shown that this expert medical opinion has been completely ignored. And, after all, several diabetic centres have worked intensively at testing these new products for the British Insulin Manufacturers, and the neglect of our known opinion has been our reward.

I feel that the above should be made public in your columns in the hope of preventing a similar occurrence again, because I think there will be further modifications of insulin within the next few years. I should like to know what other steps, apart from raising the matter in Parliament, we might take to ensure that the considered opinion of those deeply concerned with the best treatment of diabetes in this country should not again be ignored.—I am, etc.,

R. D. LAWRENCE.

London, W.1.

Insulin Zinc Suspensions

SIR,—We feel that the series of papers on the new insulins (*Journal*, November 7) require comment. We have been using "lente" insulin for the treatment of diabetic outpatients, selecting only patients requiring high doses of insulin or those in whom satisfactory control had not been achieved with other insulins. So far lente insulin has been tried in 15 cases, all of whom have been at work. In general, we agree with the authors of the several papers that in such patients lente insulin will frequently achieve satisfactory control with a single daily dose. In some respects, however, our impressions differ from those conveyed by some of the papers and by your leading article.

Drs. J. D. N. Nabarro and J. M. Stowers (p. 1027) suggest that the present mixture of lente insulin is not suitable for the British dietary habit, and your leading article (p. 1037) supports their suggestion that the proportions of crystalline suspension and amorphous insulin should be altered. This would add yet another mixture to the many available, which seems quite unnecessary. The bulk and carbohydrate content of a meal can be varied independently by any dietitian, and in this way the dietary habits of the patient can be adjusted to the type of insulin. In our experience there is no characteristic dietary habit, for, while many patients are accustomed to take their main carbohydrate meal at midday in the form of sandwiches, others habitually have it at night. It seems to us unjustifiable on the experience of some 30 cases to suggest that a mixture of insulin which has been found suitable for some 500 patients in Denmark is unsuitable in this country. Like Drs. I. Murray and R. B. Wilson (p. 1023), we have found patients who have not been as well controlled on lente insulin as on globin or a mixture of soluble and zinc protamine. We do not agree, therefore, with the suggestion of Dr. Wilfrid Oakley

various blood parasites—notably *Hepatozoon canis*, *H. gerbilli*, and *Babesia canis* in both their mammalian and insect hosts—the anatomy and histology of the tick, and the newly discovered parasite of kala-azar. In 1909 he founded the Central Malaria Bureau at Kasauli and started the collections which formed the basis for systematic study of the mosquito fauna of India. He returned to this work after military duty during the first world war in Mesopotamia, where, as might be expected, he made important observations on the anopheline fauna of that country.

In 1924 he published his classic paper on the mechanism of immunity against malaria in communities living under hyperendemic conditions. In the same year he described a new technique for the accurate measurement of the spleen, which has been used as a standard method in India for malaria surveys ever since. Before retiring from the I.M.S. in 1932 Christophers was director of the Kala-azar Commission in Assam in 1924–5 and of the Central Research Institute in Kasauli from 1925 to 1932. His volume on Anophelini in the "Fauna of British India" series appeared in 1933.



(Walter Stoneman, London)

phelini in the "Fauna of British India" series appeared in 1933.

From 1932 to 1938 Christophers was professor of malarial studies at London University with his headquarters at the London School of Hygiene and Tropical Medicine. Strains of monkey malaria had recently become available for study, and he was quick to realize the importance of this new field of research. In collaboration with J. D. Fulton he conducted a series of comparative studies of the respiratory metabolism of *Plasmodium knowlesi* and *Trypanosoma rhodesiense*, the first observations of their kind in this field. After six years he left London and settled in Cambridge, where he now lives and works. During the second world war he was in charge of the mosquito repellent inquiry. During his investigation of the repellent properties of several hundred substances he devised new methods for breeding large numbers of mosquitoes in the laboratory and techniques for the testing of repellency. When hostilities ceased he found himself at last free to return to his first love, the mosquito. He is at present engaged on a study of the natural history and structure of *Aedes aegypti*, and this, we understand, is nearing completion. Recently he delivered the Manson Lecture on "Malaria in the Field" before a large and enthusiastic audience at the London School of Hygiene.

A list of all the honours Sir Rickard has received would be a lengthy one. He was appointed C.I.E. in 1915, made Honorary Physician to the King from 1927 to 1930, and knighted in 1931. He has received numerous medals, among them being the Queen Wilhelmina Jubilee Foundation Medal in 1928 and, this year, the Buchanan Medal of the Royal Society, to which he was elected in 1926. His presidency of the Royal Society of Tropical Medicine and Hygiene ran from 1939 to 1943.

His work continues, and he still maintains an interest in a side-line study, that of geology. His many friends, not least those in India, will join in extending their heartiest good wishes to him and to Lady Christophers on this occasion.

(p. 1021) that globin and P.Z.I. insulin should be withdrawn. No paper reports local reactions to the new insulins. Two of our patients who are sensitive to globin and P.Z.I. have also developed local reactions to lente insulin.

Drs. Nabarro and Stowers suggest that insulin should be injected one hour before breakfast. We have not found this necessary. Many of our diabetics leave for their work at 6 a.m. after taking their insulin and a light breakfast at 5.30 a.m. They have a second breakfast when they get to work. They would be reluctant (and unlikely) to get up before 5 a.m. in order to inject their insulin.

There is no doubt that the new insulins, particularly lente, are a valuable addition to the range available for treating diabetes. We do not think that any one preparation can cover the whole range of the diabetic population; the other insulin preparations which are available have still a place in out-patient treatment.—We are, etc.,

A. STUART MASON.
D. VEREL.

London, E.1.

SIR,—We should be grateful if you would allow us to comment on some of the points raised in the three articles on the insulin zinc suspensions ("lente" insulins) published in the *Journal* of November 7, and in your leading article on this topic in the same issue (p. 1037).

In his authoritative paper Dr. Wilfrid Oakley (p. 1021) suggests that, while the time is ripe for the introduction of "lente" insulin, the marketing of "semilente" and "ultralente" should be deferred. However, as Drs. Ian Murray and Robert B. Wilson make clear in their article (p. 1023), some diabetic patients cannot obtain with lente alone a control superior to that achieved with the previously available insulin preparations: they need a mixture of lente with semi- or ultralente. It would seem a pity to deny to these patients, few though they are, the advantages of the lente series when many of their fellow patients will certainly be gaining these advantages—from the lente preparation used by itself. Very careful trials have been and are being carried out with both semilente and ultralente in Denmark and in this country, and the results are certainly favourable.

Drs. Nabarro and Stowers suggest that an 80 u. per ml. ultralente preparation is desirable. It was not anticipated by Novo, or indeed by the other manufacturers, that there would be any great demand for the preparation in this strength; but, if there should prove to be such a demand, steps will be taken to meet it. As regards their desideratum of a lente preparation that can be mixed with soluble insulin to give a mixture of predictable effect, the Novo Laboratories have this under very active consideration. We would, however, point out that semilente can be so mixed, that in its action it resembles soluble insulin fairly closely, and that in future the only major sphere of usefulness of soluble insulin may well prove to be that of diabetic emergencies. In other words, for everyday use the lente series will be sufficient.

As regards their final suggestion that for the lente preparation a semilente-ultralente ratio of 2:8 (or 1:4) would be more suitable to the British dietary than the present lente ratio of 3:7, it can be stated that Novo also have this matter under consideration. While prepared to make any necessary adjustment in lente for this country, Novo are unwilling to do this unless the need for it is generally accepted. Other things being equal, it would obviously be undesirable to have a lente preparation that differed in its composition from country to country; though doubtless, in view of the multiple dietary variations that do exist, a case could be made for such variation.

Finally, in connexion with the implication in your leading article that supplies of the lente insulins are inadequate, we would point out that unless the size of the demand is known it is impossible to say whether or not supplies will be sufficient. While demand may outrun the supply, there are no grounds at present for advising doctors not to prescribe the lente insulins for those patients who will clearly be suited by them.—We are, etc.,

Medical Information Department,
Evans Medical Supplies Ltd.,
Liverpool.

R. POWELL.
S. BRADSHAW.

Appendix in Hernial Sac

SIR,—Recent correspondence in the *Journal* on the incidence of inflamed appendices in hernial sacs has revealed six cases—two inguinal (Dr. T. E. Winckworth, September 5, p. 567; Mr. H. B. Walker, October 17, p. 886) and four

femoral (Dr. T. D. S. Holliday and Mr. J. R. A. White, two cases, October 3, p. 779; Dr. D. G. Maurice, two cases, October 17, p. 887). In all except one the appendix was removed through the incision used for the exploration of the hernia. The surmise of the true incidence depends on recording details of such cases when the question is raised, and hence the following notes of a true strangulation of the appendix which I recently encountered are offered.

A moderately thin woman of 36 was suddenly seized with pain in the right groin followed by vomiting. Over the next few hours a small lump in this region, noticed by the doctor, gradually became tender, and the patient was referred to hospital. A small, fixed, tender, cherry-sized lump was found over the right femoral region. There was no discoloration and no source of infection in the leg. Exploration revealed a U-loop of a fairly long appendix tightly strangulated in the femoral canal, the tip and base being normal. The appendix was removed, none too easily, as the portion of caecum to which the base was attached could just be drawn into the canal and no more. Repair was then carried out, and this was followed by rapid recovery.

As regards the question of normal appendices in hernial sacs also raised, I recently removed an appendix the tip of which protruded through an inguinal sac on the left side in a small child—an unexpected manoeuvre.—I am, etc.,

Wolverhampton.

HENRY B. YOUNG.

SIR,—I have noted the various letters on this subject and am particularly interested in Mr. H. B. Walker's case in a 7-weeks-old infant (*Journal*, October 17, p. 886).

Some years ago I had a similar case in the Royal Hospital for Sick Children, Glasgow. The patient, a boy, was born two months prematurely and on admission he was 3 weeks old and weighed 3 lb. 12 oz. (1.7 kg.), so that he was operated on five weeks before he should have been born. A large right scrotal hernia had been present since birth but gave no trouble until the day before admission, when it increased in size and became irreducible, with continuous vomiting and constipation.

Under a general anaesthetic, the large mass of hernia was reduced by taxis except for a sausage-shaped swelling which still extended along the inguinal canal into the scrotum. It could be rolled under the fingers, and it was diagnosed as probably the appendix. In spite of the protests of the theatre sister I decided to operate. The large sac was dissected out and opened. It contained the appendix, which was gangrenous in the distal two-thirds, owing to strangulation in the neck of the sac. The appendix was removed and the hernia repaired. Recovery was uneventful.

It is well to remember that, while strangulation in inguinal hernia in infants is uncommon, it certainly does occur. The danger of a reduction *en masse* in such a case is well known, and it would appear from this case that the possibility of leaving a strangulated gangrenous appendix after apparent complete reduction by taxis must be borne in mind.—I am, etc.,

Glasgow.

WILLIAM BEATTIE.

Overseas Service

SIR,—Mr. Ian Fraser (*Journal*, October 31, p. 987) is right. It is lamentable that in a great imperial and maritime country thousands should be moaning for comfortable jobs in the N.H.S. at home when there is so much work to be done in places like the Gold Coast. Tough work, certainly, but so remarkably varied and highly coloured. He is right, too, in asserting that a doctor should be paid more than most other classes of expatriate, the mental and physical strain of a medical officer's work being so much heavier. Compare it, for example, with that of a person sitting in an office in secretariat or treasury.

A serious deterrent to service overseas now is the greater difficulty in re-settling, compared with pre-1948 times, after normal retirement, or earlier retirement for health, family, or other reasons. Here the Ministry of Health could help by a directive that whenever a post in the N.H.S. is being filled, whether hospital (other than teaching) or general practice, any applicant who has served six or more years in the armed Forces, Colonial Service, or mission field, and is otherwise adequately qualified, should have preference over all applicants who have not so served.

It is unfortunate that there is in medical circles in this country a certain bias against those of us who work overseas. If at a refined medical gathering one mentions that one is in the Colonial Service (as I used to be), or a ship surgeon (as I am now), there is a distinct drop in the temperature. A directive such as that outlined above would be simple and just, and its benefits would be felt in many quarters.—I am, etc.,

Bristol, 8.

G. L. ALEXANDER.

SIR,—I refer to the article by my friend Mr. Ian Fraser on the need for medical officers in the Gold Coast (*Journal*, October 31, p. 987) and your annotation (p. 984). A poet has written that "the thoughts of youth are long, long thoughts." The thoughts of young medical men and women are long enough to stretch ahead to the end of a normal period of service in the Tropics, and to cause them to ask about their prospects of employment on returning home, for I do not think that Mr. Fraser would suggest that service in the Tropics should be for the term of one's natural life.

If, like myself, the returning physician, surgeon, sanitarian, pathologist, ophthalmologist, etc., is a native of Northern Ireland, he will find, for example, that the public health service there is completely closed to him by the regulation which debar anyone from holding a public health appointment unless he has been continuously resident in the United Kingdom for five years immediately preceding. If he seeks a hospital appointment he comes up against the age limit, and if he seeks to enter general practice he finds that the panel has been virtually closed for some years. I am not well informed about the position in the rest of the United Kingdom, but within the circle of my own acquaintance I could name two surgical specialists, an ophthalmic specialist, a pathologist, and the chief health officer of a State, none of whom are employed in their specialties. The principal medical officer of a colony obtained a public health appointment of the grade open to persons qualified for two years.

If, as Mr. Fraser says, the specialist service in the Gold Coast is the first priority, I can think of no more potent attraction to bring good men and women into the service, and keep them there for the full term of service, than the assurance that the emeritus medical officer who is highly qualified academically and by experience and by achievement will be employed in a post worthy of his capacity on his return.—I am, etc.,

Belfast.

H. G. CALWELL.

Medical Needs in the Gold Coast

SIR,—As one who has been in the Gold Coast Medical Service, I read your annotation (*Journal*, October 31, p. 984) with considerable concern. You write of a country subject to rapid economic and political change. Rapid political change may well be, but the evidence of rapid economic change is difficult to see. We must remember that the Gold Coast is, in the sterling area, second only to Malaya in earning dollars, and her economic future is reasonably assured. The prospect of uncertainty of employment of non-Africans during the next forty years is so remote as to be out of sight. As Mr. Ian Fraser writes (*Journal*, October 31, p. 987), "Certainly this [Africanization] will happen in time, but at the moment the question does not arise."

It is indeed an exaggeration to imply that qualified Africans are reluctant to return home. Only one Government scholar has remained in the United Kingdom, and all privately qualified Africans have returned to the Gold Coast except one. This has occurred over the last twenty years, during which some twenty scholars have been sent to the United Kingdom. The Government scholar who stayed behind is now fully ready for appointment "to fill one of the many specialist posts available" mentioned by Mr. Fraser. It remains to be seen whether he will get appointed. It can be stated with every confidence that all who wish to go and help can do so with assured prospects of work

in an exhilarating field where, in the absence of the accustomed diagnostic aids, there is required greater clinical acumen.—I am, etc.,

K. A. TAYLOR.

Ecceles.

Symptoms of Temporal Arteritis

SIR,—Like Dr. K. V. Crowther (*Journal*, October 17, p. 888), I have been interested in the association of joint pains with arteritic symptoms in temporal arteritis. I met this association in the first case which I saw 17 years ago, and from my subsequent personal experience of the disease and from that of others it is evident that the association is not fortuitous. While Dr. Crowther's case may have had an arteritis near the hip-joints, an arthritis in those joints is a more probable explanation of the sudden pain around the hips. The late Dr. John Gray, who examined the temporal artery section in my first case, while not able to exclude polyarteritis nodosa, was more struck by a similarity of the condition to rheumatic arteritis. I have recently had a case² of a febrile illness with headaches, arthritis, and the general manifestations so like those of severe "temporal arteritis" that, though the temporal arteries appeared clear, I felt that it was almost certainly a case of that condition.

We should not regard the joint symptoms, the cerebral symptoms, or scalp ulceration as complications so much as different aspects of this complaint. No one denies that its most striking features are polyarteritic and, in particular, an arteritis of the temporal vessels. But the degenerative collagen changes are soon seen to be both periarterial—hence the very interesting and unusual scalp ulceration described by Dr. David Kendall (*Journal*, August 22, p. 418)—and widespread in other tissues. The fever, anaemia, loss of weight, and joint symptoms which are so often seen in temporal arteritis rank it as a generalized "collagen" or "pararheumatic" disease akin to rheumatism, acute diffuse lupus erythematosus, dermatomyositis, and the rest. Perhaps it is a manifestation of the hypersensitivity state largely peculiar to old people. Certainly prolonged cortisone and A.C.T.H. are its best treatment, with salicylates as a less effective reserve.—I am, etc.,

G. H. JENNINGS.

Edgware.

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Sickle-cell Anaemia

SIR,—The paper on sickle-cell anaemia by Dr. G. M. Edington (*Journal*, October 31, p. 957) raises many important points, though perhaps none is more interesting than the observation that sickle-cell disease becomes less severe with age, and that, in fact, his oldest patient, aged 44 years, had no attacks or crises for nine years. It was already known that the onset of the disease is not at birth or even in very early infancy. Vandepitte and Louis¹ reported recently that they had discovered a test for sickle-cell anaemia which was positive even in babies with "pre-clinical" sickle-cell anaemia.

In Africa it has been difficult to accept the homozygous theory of sickle-cell anaemia of Neel² and Beet.³ With the great number of Africans showing the sickling phenomenon one would expect a disease occurring in all homozygotes to be more common. It was then reported by the Lambotte-Legrands⁴ and Foy and his colleagues⁵ that a search among the younger age groups showed sickle-cell anaemia to be more frequent, and it was suggested that the disease was rare in adults because those who suffered from it failed to grow up. This seemed to be impossible at least so far as those African tribes were concerned in whom very high incidences of the sickling trait had been discovered⁶—so high that they had to include homozygotes. The sickling gene seems to vary in the amount of abnormal haemoglobin it confers in different families,⁷ and it is possible therefore that in these tribes in many instances one gene produces rather less than 25% of the abnormal haemo-

globin, so that even homozygotes fail to accumulate the level of more than 50% which seems to be necessary to cause the anaemia. However, Dr. Edington's observation that sickle-cell anaemia becomes less severe with advancing age might go far in clarifying what up to now was a difficulty to those wanting to reconcile the homozygous theory with the sickle-cell anaemia incidence found in Africa. It is noteworthy that thalassaemia also becomes less severe with age, and, provided it is possible to keep those who suffer from it alive with transfusions, even severely ill children can become virtually symptom-free when they reach adolescence. Dr. Edington's observations tally with some of my own and in retrospect they fit in with what I noticed in some adults in Uganda.

It might be worth while in future investigations of sickle-cell anaemia incidence to differentiate between those homozygotes who actually suffer from the disease and the others who are at risk only. The first group would be found largely in childhood, and the second would include apparently healthy neonates and adults. In parallel with thalassaemia the purely clinical diagnosis of sickle-cell anaemia would then be divided into a major, minor, and minimal dyscrasia. On a recent visit to Greece I found that Professor Choremis already made such a subdivision for purely clinical reasons. The parallel between thalassaemia and sickle-cell anaemia can be carried further. Both the potentially lethal thalassaemia gene in Italy and Greece and the sickling gene in Africa should have died out rather than exist at the high frequency at which they are actually found. Neel¹ has recently summarized possible explanations for this apparent paradox. One is that a very high mutation rate reproduces the gene often enough to replace the loss caused by deaths from sickle-cell anaemia; another is that sickle-cell haemoglobin may confer a reproductive advantage balancing the genetic disadvantage—the theory of "balanced polymorphism." Thus Brain² recently drew attention to the possibility that sickle-cell haemoglobin might give relative protection against malaria parasites. This theory, if confirmed, would go far in helping to explain the geographical distribution of the trait (it is a fact that its incidence is high only in regions where there is much malaria) and would usefully supplement the purely anthropological approach to the phenomenon.

Thalassaemia and sickle-cell anaemia have in common a significant percentage of foetal haemoglobin in the red cells. It has recently been possible to differentiate between adult and young infants' red cells by means of a specific agglutinating serum,³ and, although the number of tests is not yet large, the only adults whose cells were also agglutinated by the anti-foetal red cell agglutinin were all sickle-cell anaemia and thalassaemia major patients and some—but not all—carriers of the thalassaemia and of the sickling trait. This suggests that all these individuals had, in common with young infants, a component of their red cell envelope not found in normal adults. It may not be a coincidence that the decline in the "natural resistance" of the newborn to malaria takes place when it loses its foetal haemoglobin.—I am, etc.,

H. LEHMANN.

London, E.C.1.

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Anal Fissure in Children

SIR,—In the descriptions of fissure in ano which appear in general medical journals there is often no reference at all to its occurrence in children (*Journal*, October 10, 1953). Yet this common condition is possibly even commoner in childhood than in adult life. It is true that the natural history of anal fissure is similar in adults and children, but a few differences are worth noting.

In the large majority of children in whom a fissure is found the onset can clearly be dated back to a time when large constipated stools were passed, often with an acute

febrile illness; occasionally, and especially in infants, the onset synchronizes with a bout of acute enteritis. The typical case presents as a child who, with dramatic suddenness, has developed an intense fear of defaecation. The abdomen is often distended, there may be bouts of abdominal pain, and sometimes defaecation is accompanied by vomiting. In the worst cases, in which chronic obstipation has been allowed to develop, a "rockery" of faecal masses can be felt in the abdomen, and in a few overflow incontinence of stools occurs. In childhood sentinel tags are uncommon, and complications such as mucosal polyp, abscess formation, and fistula formation extremely rare.

The results of simple medical treatment are almost uniformly good, and possibly children are more amenable than adults in this respect. In 30 consecutive patients a cure resulted in 27; 2 further patients did not return to report progress; and in 1 other the fissure had not healed completely after intermittent (and possibly inefficiently applied) treatment over a period of several months. In all but a few the treatment was carried out by the mother at home. In a small number in whom the mother's co-operation was doubtful, and the response unsatisfactory, medical treatment was repeated in hospital with good results. In a few severely constipated cases olive oil enemata were given as a preliminary measure. Fissures seen in the acute stage healed within two, or at most three, weeks. The chronic fissures sometimes took several weeks to heal, but eventually disappeared completely. In one child a fissure recurred after apparent cure, but this was probably due to obstipation in a patient with grossly defective toilet training.

The essential of treatment is to relieve pain and the consequent spasm which prevents healing of the fissure. For this purpose 1% amethocaine ointment was applied to the raw area: in this strength it proved effective, and there were no examples of induced skin sensitivity which has been described with higher concentrations in adults. The mother was shown how to insert the ointment on a pledget of wool firmly wrapped on an orange stick or on the tip of her small finger (with the nail cut short), a procedure which she was instructed to carry out three times daily and particularly before defaecation was expected. Her relief, and the child's, at the demonstration of complete painlessness induced by the surface analgesic were potent factors in ensuring co-operation in treatment. The children were encouraged to defaecate at a regular time each day. Small quantities of liquid paraffin were given several times daily and continued for several months after cure. It was not found necessary to make any changes in the diet.

Although chronic fissures in childhood respond satisfactorily to treatment, and undoubtedly some acute fissures resolve spontaneously, it appears advisable to treat all cases early. By so doing not only is unnecessary suffering obviated, but the formation of a habit of chronic constipation (which can persist indefinitely even after the fissure has healed) is forestalled.—I am, etc.,

Bristol.

JOHN APLEY.

Thyrotoxicosis and Purpura

SIR,—The publication in the *Journal* of October 31 (p. 976) of the medical memorandum by Drs. W. G. D. Caldwell and M. Meikle on one of those rare cases in which thyrotoxicosis and purpura are associated prompts me to record the following case, the only one of this type which I met with amongst about 2,000 cases of thyrotoxicosis during the years 1921–51. I will report those details only which are relevant to the subject of the letter.

A married woman aged 40 was sent to me on September 11, 1948, suffering from typical thyrotoxicosis. She had had no treatment. On being given the choice of medical or surgical treatment she at once chose operation. She was admitted on September 13 and prepared with Lugol's solution, min. 7 (0.42 ml.) three times a day, until September 20, when I performed a bilateral subtotal thyroidectomy. As the iodine was given for the first time, she reacted very well. No iodine was given after operation. She had no upset and was sent home on October 1

with a healed wound and doing well. On my return from holiday a fortnight later I found an urgent message to visit her at once. She was in bed suffering from sleeplessness due to three days' intolerable itching in both lower limbs. She had many purpuric bruises on both legs and thighs, and stiffness of her knees. She was readmitted and the pathologist reported on her blood as follows: October 18, 1948, haemoglobin 80%; red cells 4,270,000; colour index 0.94; red cell morphology normal; leucocytes 9,100 (polymorphs 6,051; lymphocytes 2,457; monocytes 455; eosinophils 46; basophils 91); Arnett count, shift to left; platelets 185,000. No further purpuric areas appeared and the condition subsided without incident in two to three weeks. The stiffness of the knees improved, but did not altogether disappear for some months. She made a very rapid recovery from the thyrotoxicosis, was in full charge of her business two months after operation, and has remained in very good health.

On careful investigation of her history it was found that her symptoms had begun about five days before operation. She had spasms of coldness down her spine and stiffness of the knees, and had reported this to the nurses. It had continued after operation, but had not become really troublesome until after she returned home. The only explanation I could think of was that she had a rare idiosyncrasy to the potassium iodide in the Lugol's solution. Is it possible, if this view is correct, that the condition of severe thrombocytopenic purpura recorded in association with thyrotoxicosis may be due to long-continued administration of Lugol's solution in patients with a similar idiosyncrasy to potassium iodide?—I am, etc.,

Bradford

PETER MCEWAN.

Niels Stensen

SIR,—Your paragraph on Niels Stensen (*Journal*, October 31, p. 992) contains the sentence: "He became a convert to Roman Catholicism and was nominated as Bishop of Titiopolis," which appears to give the impression that he was made a bishop merely as a result of, or as a reward for, his conversion.

Stensen's discoveries were not at first appreciated in his own country. He therefore went to Florence, where he was appointed anatomist to the Hospital of Santa Maria Nuova. It was while in this city that he became convinced of the truth of Catholicism, and he was received into the Church in 1667. Mainly through the influence of Griffenfeldt he was nominated to the post of Anatomicus Regius in the University of Copenhagen. He could not be made a professor to the university, as no Catholic was permitted to hold that position. Two years later he returned to Italy, where he began his studies for the priesthood. He received holy orders in 1675, and two years after was consecrated bishop. He worked in Münster, Osnabrück, Paderborn, and Cologne as a priest. He gave all his possessions to the poor and lived a life of mortification.—I am, etc.,

Llwynypia.

M. S. PATHY.

Succinylcholine Chloride for Casualty Anaesthesia

SIR,—I should like to make a few points on the subject of succinylcholine chloride for casualty anaesthesia. First, Dr. D. C. Adamson has stated (*Journal*, October 31, p. 993) that he observed relaxation of the cardiac sphincter when succinylcholine was given during oesophagoscopy. I find it hard to believe that this is a property of the drug in question, as there are reasons for believing that it only acts on the striated muscle of the upper half of the oesophagus. Furthermore, the sphincter may be seen opening with each inspiration when the oesophagoscopy is carried out under local analgesia alone.

Secondly, I would like to stress that the sequelae of a combination of succinylcholine chloride and short minimal anaesthesia can be very uncomfortable to the patient. Distressing muscular stiffness appears to be by no means a rare complaint if these anaesthetics are carefully followed up. I observed another sequela while doing a series of some 30 anaesthetics for in-patient E.C.T. which I have not seen referred to. A high proportion of patients given thiopentone succinylcholine chloride developed sore throats after a variable delay of up to two hours. None given thiopentone

gallamine triethiodide did so, and the further interesting fact emerged that it was those who had a completely or almost completely modified convulsion who developed the complaint. I am indebted to Dr. J. G. Bourne for the suggestion that this "sore throat" was the patients' interpretation of stiffness of the pharyngeal muscles. Had these been out-patients, or had an endotracheal tube been passed, I doubt whether this disadvantage of succinylcholine chloride would have been observed or properly interpreted.

Thirdly, I feel that casualty anaesthesia will always be administered in part by those who are not specialists in the field of anaesthesia, and the requirements of such a technique are safety, simplicity, effectiveness, and the use of drugs with which the administrator is likely to be familiar with apparatus which is likely to be already found in most casualty theatres. I think the following technique meets with these requirements: 5 to 10 ml. of ethyl chloride is sprayed into the empty chloroform bottle on a standard Boyle's machine and the cork is replaced. Two litres of oxygen and 6 litres of nitrous oxide a minute are run through the machine and the lever on the chloroform bottle is raised until the ethyl chloride can just be smelt emerging from the mask. Induction is then commenced.

This ensures adequate oxygenation and at the same time precludes access to the patient of a sudden strong concentration of ethyl chloride vapour.

Initially the mask need not be held against the face, and induction by this method appears to be much smoother and more pleasant to the patient than one would anticipate. The concentration of ethyl chloride is gradually increased, but it is rarely necessary to depress the plunger on the bottle. Emergence is rapid, overdosage is almost impossible, and neither salivation nor vomiting is a feature of this technique.—I am, etc.,

Thornton Heath.

V. P. WORDSWORTH.

Laryngeal Vertigo

SIR,—Dr. C. W. M. Whitty's "cough syncope" (*Journal*, November 7, p. 1047) is a better title than the present one. During the winter it is not an unusual occurrence for a patient in general practice to complain that a severe spasm of cough has produced a momentary blackout of vision or even loss of consciousness. But, when this complication under the misnomer of laryngeal vertigo was the plea in defence of a suspected drunk-in-charge, I, as the police medical witness, agreed with the opposing counsel that I had never before seen a case (and was therefore presumably unfit to recognize one). However, in his turn, the otorhinolaryngologist appearing for the defence had to admit that his only personal experience of such a case was a wartime one in which he had advised the grounding of an R.A.F. pilot—in fact, the present defendant.

May it not be that the few cases which have filtered into a specialist department have given both title and apparent rarity to this "general practice" symptom?—I am, etc.,

R. N. C. SMITH.

Ilford.

A Case of Anthrax

SIR,—I feel that the following case is sufficiently unusual to be worthy of record.

A woman of 27, a Civil Servant, was admitted to hospital on July 9. About seven days prior to admission she noticed a small spot on the skin over the right clavicle which she thought was due to an insect bite. Very soon swelling of the surrounding skin occurred, and this spread to involve the right side of the neck and the front of the chest. The swelling was painful and there was considerable itching of the skin. On admission she was severely ill with a subnormal temperature and peripheral circulatory collapse. The blood pressure was unrecordable, but she was able to give a fairly clear history. The whole of the front of the chest, including the breasts, and the right side of the neck were swollen by very firm oedema and the overlying skin was erythematous and patchily haemorrhagic. Just above the right clavicle there was a shallow ulcer with a dark red base about 1 in. by $\frac{1}{2}$ in. (2.5 cm. by 1.25 cm.) in size. There was some serous exudate but no pus. A few inconspicuous vesicles surrounded the ulcer.

Anthrax was considered, but at first not seriously, as there was nothing in the history to suggest a possible source of infection. Fortunately swabs were taken both from the base of the ulcer and from one of the vesicles, and from each Gram-positive bacilli were found on direct examination. These were later proved to be *Bacillus anthracis* and the diagnosis was confirmed by pathogenicity tests. She was at once treated with penicillin, 1 million units six-hourly, until July 18. Recovery from the toxæmia and peripheral circulatory failure was reasonably rapid, but the oedema decreased slowly and the local lesion took nearly a month to heal completely. She was given terramycin, 2 g. daily, from July 20 to July 27. On July 17 she became pyrexial for the first time, and on July 18 she began to complain of pain in the calves, and this pain rapidly increased in intensity. By July 19 there was severe hyperæsthesia of both legs, marked loss of power in all the muscle groups of the legs, and some weakness of the wrists and hands. All the tendon reflexes were brisk and equal and a full neurological examination showed no other abnormalities. An irregular fever, reaching 103° F. (39.4° C.) on one occasion, continued until July 31. The pain and weakness gradually decreased and she was discharged from hospital free from all signs and symptoms on August 8. It was assumed that she had had an acute "toxic" polyneuritis, but the rapid recovery and the absence of changes in the reflexes seem to make this diagnosis unlikely. A lumbar puncture was not performed.

Infection in this case is believed to have been due to an insect bite. The medical officer of health for Croydon has informed me that no cases of human anthrax have been reported in the past few years, but that a case of animal anthrax was notified in December, 1952, at premises within two miles of the place in which the patient thought she had been bitten by an insect.—I am, etc.,

Thornton Heath, Surrey.

G. P. BAKER.

Rupture of the Spleen after Glandular Fever

SIR.—The description by Mr. R. W. Tudor (*Journal*, October 10, p. 813) of rupture of the spleen in a case of infective mononucleosis recalls a similar example.

A schoolgirl, aged 6 years, who had had transient jaundice two months earlier, tripped on her nightgown when going upstairs and fell forwards. She was admitted to hospital with pallor, rapid pulse, and tenderness over the middle of the abdomen. Her condition was stationary over several hours. There was no evidence of blood in the stools and the urine was normal. The history of transient jaundice suggested the possibility of a previous hæmolytic crisis. The medical registrar, Dr. C. Cohen, however, postulated a glandular fever with jaundice, splenomegaly, and subsequent rupture. In view of persisting abdominal rigidity, laparotomy was considered advisable, and this diagnosis was confirmed. The peritoneal cavity contained much clotted blood. The spleen was enlarged to about four times the normal size, and showed a rupture round the upper third, linear on the outer and contused on the inner aspect. Splenectomy was performed and a pint (0.57 l.) of blood was transfused. She made good progress, and she was discharged twelve days later.

Blood counts after operation showed: white cells 23,800 (polymorphonuclears 56%; lymphocytes 38%; monocytes 6%). On the fourth post-operative day: red cells 4,050,000; Hb 66% (9.7 g.); white cells 19,700 (neutrophil polymorphonuclears 29%; lymphocytes 62%; monocytes 6%; eosinophils 2%; basophils 1%); reticulocytes 5%; platelets 527,000; Race-Coombs test negative; 4 nucleated red cells per 100 white cells; red cell fragility normal; moderate degree of microcytosis, but cells well filled with hæmoglobin. Six days after operation the Paul-Bunnell test was positive in dilution of 1 in 128; thymol turbidity 9.4 units; thymol flocculation 2+; alcohol turbidity 14.7 units; zinc sulphate turbidity 9.4 units; colloidal gold 2; alkaline phosphatase 9.6 units. The urine showed absence of bile salts and bilirubin, and slight increase of urobilin. Specimen.—The cut surface of the enlarged spleen presented numerous small opaque white spots, less than 1 mm. in diameter, which were not raised above the surface. Microscopic examination showed the sinuses packed with blood, no gross sinus proliferation, but the Malpighian bodies enlarged as a result of central oedema. There was diminution of the lymphoid element of the Malpighian body and an increase centrally in the reticulo-endothelial cells.

Jaundice is not a usual accompaniment of glandular fever. The further occurrence of splenomegaly and of rupture of the spleen spontaneously or after minor trauma has been described in the relatively few cases to which Mr. Tudor has referred.—I am, etc.,

Carlisle.

R. M. HILL.

POINTS FROM LETTERS

Appendix in the Hernial Sac

Mr. R. T. BURKITT (Nairobi) writes: I have just seen Dr. T. E. Winckworth's letter (*Journal*, September 5, p. 567). Some years ago I had a similar case, the gangrenous appendix this time lying in a small femoral sac. The interest in this case was accentuated by the fact that the patient was aged 92. If I remember rightly she made a satisfactory immediate recovery from the operation, but, as so often happens in old people, the enforced recumbency was too much for her and she died some weeks later.

Mr. N. N. IOVETZ-TERESHCHENKO (Georgetown, British Guiana) writes: Although Dr. T. E. Winckworth (*Journal*, September 5, p. 567) has not met anyone who has also found an appendix in a hernial sac, the condition is not particularly rare. In the first reported case of survival after removal of a perforated appendix the viscus was found in the sac of what was thought to be a strangulated right inguinal hernia (Hall, R. J., 1886, *N.Y. med. J.*, 43, 662). Since then many cases have been reported, mostly from Latin countries. Personally, I have on eight occasions found the appendix in a hernial sac and removed it—three times in a right femoral hernia and five times in a right inguinal hernia. So far in only one case was the appendix actually acutely inflamed at the time of removal.

Oily Stools and Antibiotic Therapy

Dr. RUSTOM JAL VAKIL (Bombay) writes: In view of the extensive and universal application of newer antibiotics, I would like to call attention to an apparently common, though innocuous, side-effect of such therapy. Routine inspection of stools after the therapeutic use of newer antibiotics, such as aureomycin, terramycin, and erythromycin, has disclosed the frequent appearance (in over 10% of cases) of oily or fatty stools. Examination reveals a layer of oil or oily droplets floating on top of an otherwise healthy stool. The incidence of this phenomenon appears almost twice as great with erythromycin as with terramycin and aureomycin. The condition, which is apparently quite harmless, may appear even within 48 hours of the inception of antibiotic therapy and may outlast it by several days or weeks (up to five weeks in one case).

Succinylcholine Chloride for Casualty Anaesthesia

Dr. D. J. ADDERLEY (Epsom) writes: There is one stage in the use of succinylcholine chloride in the casualty department described by Drs. T. Vaz and J. M. Bishop (*Journal*, October 17, p. 885) at which difficulties may be experienced—namely, that at which the needle is introduced into a vein before strapping the syringe to the hand. I have found when giving succinylcholine chloride alone, prior to thiopentone for electro-convulsive therapy, that very small quantities of the drug released into the circulation give rise to most unpleasant sensations in a conscious patient. This has occurred, for example, when a second attempt at venepuncture has been necessary owing to extraveneous leakage. The patient looks terrified, cries out, and raises his hand to his throat as if feeling choked. The quantity required to produce this effect could easily be injected in the early stages of this technique, but if care is taken to avoid this no trouble should arise.

Spectacles

Dr. M. ASTON KEY (Southsea) writes: Dr. C. F. Hadfield (*Journal*, October 17, p. 886) has quoted Dr. Samuel Gee as professing contempt for spectacles as a remedy for migraine. Let me recount the experience of another senior physician of one of our largest London medical schools, who told me himself that he had occasionally fallen unconscious in a ropewalk tube train in an attack of migraine, and had been carried out and laid on the platform until he recovered. He had consulted four leading London oculists without benefit. He then consulted the late Mr Ernest Clarke, who prescribed spectacles which immediately relieved him, and the trouble ceased.

Avalanche of Advertisements

Dr. B. SANDLER (Urmston, Lancs) writes: I should like to draw attention to one of the minor nuisances in life which medical practitioners must suffer from advertisers in this country. A though I changed my surgery four years ago and have several times notified pharmaceutical houses I have never had even a acknowledgment of my letters, and an avalanche of advertising material still follows me round on my holidays and elsewhere. Can anyone suggest a satisfactory method of informing the pharmaceutical houses that the net effect of their failure to address letters to the correct address is very effectively neutralize the value of all their advertising?

Obituary

Sir LANCELOT BARRINGTON-WARD, K.C.V.O.
Ch.M., F.R.C.S., F.R.C.S.Ed.

Sir Lancelot Barrington-Ward, formerly Surgeon to the Household of the late King George VI, died at his home at Bury St. Edmunds on November 17 at the age of 69. Earlier this year he underwent a serious operation in the General Infirmary at Leeds.

Lancelot Edward Barrington-Ward was born at Worcester on July 4, 1884, the second of the five sons of the late Canon M. J. Barrington-Ward, all of whom were King's (or Queen's) Scholars at Westminster School and all of whom attained eminence in later life.



(Press Portrait Bureau, London)

One of his younger brothers, Mr. R. M. Barrington-Ward, was Editor of *The Times* from 1941 up to the time of his death in 1948. Lancelot Barrington-Ward was educated at Westminster and Bromsgrove Schools, gaining classical scholarships to both, and at Worcester College, Oxford, where he was a classical exhibitor. For his medical training he went to Edinburgh and graduated M.B., Ch.B., with

honours, in 1908. He was elected F.R.C.S.Ed. in 1910, became a Fellow of the Royal College of Surgeons of England in 1912, and in the following year proceeded to the Ch.M., again with honours, being awarded the Chiene medal in surgery in the same year. After holding the appointment of house-surgeon at the Edinburgh Royal Infirmary, he came south to The Hospital for Sick Children, Great Ormond Street, where he served successively as casualty officer, house-surgeon, and medical superintendent. His experience and interest in children's surgery gained him a post on the surgical staff of the hospital in 1914. On the outbreak of war later in that year he went off immediately to the Balkans, serving as surgeon-in-chief of No. 2 Serbian Relief Fund Hospital with the rank of honorary colonel in the Serbian Army Medical Service, and for this work he received the award of the Order of St. Sava. Later he worked as a surgeon in military hospitals in this country. When still a young man Barrington-Ward's ability as a surgeon was widely recognized, and he was called in during the illness of Prince Albert (later King George VI), on whom he performed an appendicectomy in 1918. During his lifetime he operated on other members of the Royal Family, including the late Queen of Norway. In 1935 he was created K.C.V.O., and in the following year was appointed Surgeon-in-Ordinary to the Household of the Duke and Duchess of York, continuing from 1937 as Surgeon to His Majesty's Household. Last year he was appointed an Extra Surgeon to the Queen's Household.

In addition to his work at Great Ormond Street Barrington-Ward was on the staff of the Royal Northern Hospital, where he eventually became senior

surgeon, and he also had a large consultant practice. He was an examiner in surgery for the Universities of Edinburgh and St. Andrews. His experience in children's surgery is recorded in the many articles he published in various journals, and he wrote an excellent textbook entitled *Abdominal Surgery of Children*. He also edited and contributed to the *Royal Northern Text-book of Operative Surgery*. His work on idiopathic dilatation of the colon was of outstanding merit. He was appointed Hunterian Professor at the Royal College of Surgeons of England in 1952. His success as a surgeon was not due only to his technical skill and clinical judgment: he was a most gentle and sympathetic surgeon, and had the enviable knack of obtaining the confidence of the children who were his patients.

Barrington-Ward was a man of many parts, for, in addition to being a classical scholar—a rare accomplishment in a surgeon—and distinguished in his profession, he was a great sportsman, and knowledgeable enough about agriculture to have been made president of the Surrey Agricultural Association. On the Rugby field he was among the best players of his day, and was selected to play for England four times in 1910. He had the distinction of playing against Wales in the first international match played on the new Twickenham ground. Earlier he had played for Edinburgh University during six seasons, and was captain of the side in 1908. He also boxed for the University as a middle-weight. In later years he became a keen golfer.

Barrington-Ward was twice married. His first wife, formerly Miss Dorothy A. Miles, whom he married in 1917, died in 1935, leaving him with three daughters. In 1941 he married Miss Catherine Reuter, and she survives him. There was one son of the second marriage.

B. C. MAYBURY, M.B., F.R.C.S.

Mr. B. C. Maybury died suddenly at St. Thomas's Hospital, Hydestile, Godalming, on November 15 at the age of 65. He had been ill since his summer holiday.

Bernard Constable Maybury, the third son of the late Dr. A. V. Maybury, of Portsmouth, was born on February 9, 1888. From Epsom College he went on to study medicine at St. Thomas's Hospital, graduating M.B., B.S., with honours in surgery, in 1910. He won many distinctions as a student at St. Thomas's, including the Treasurer's gold medal and the Cheselden medal for anatomy and surgery. He became F.R.C.S. in 1913.

After qualification Maybury held a number of house appointments at St. Thomas's until 1915, when he entered the R.A.M.C. to serve as a surgeon specialist in the first world war, first at Netley and later in France and Italy with No. 9 Casualty Clearing Station. He was particularly interested in peripheral vascular injuries at this time, an interest that he had acquired from Sir George Makins. He made many friends among the surgeons working at casualty clearing station, and at the end of the war a group of these surgeons founded the Travelling Surgical Club, the members of which visited surgical centres in most European countries between the two wars. Maybury was a very popular member and he derived great pleasure from the club's journeys and meetings. The two great influences in his younger days and during his training were Makins and Wallace. His interest in military surgery was inspired by them, and he carried on their teachings and traditions at St. Thomas's. He was appointed to the staff after the

first world war and was junior surgeon to Sir Cuthbert Wallace until the latter's retirement: they worked together in the founding of a professorial surgical unit at the hospital.

Maybury was essentially shy and retiring, and it was difficult to get him to write or to speak in public. His rare contributions to discussions at the Royal Society of Medicine were a joy to all who heard them, and his two most important contributions to surgical literature—the articles on peritonitis and diseases of the appendix, jointly with B. W. Williams, in Choyce's *System of Surgery*, and the treatment of traumatic false aneurysm and arteriovenous fistula in the *Bulletin of War Medicine* (1945)—will live for ever. A profound and critical thinker, he was scrupulous in his attention to detail. He had a horror of error and was himself the acme of integrity. When faced with an unusual or difficult clinical problem he was at his best, and the number of his colleagues who sought his advice on professional and other matters was the greatest tribute to his wisdom. He could be brusque on occasion, but none of his patients doubted his sympathetic understanding of their troubles.

He was an excellent teacher for the more intelligent, though sometimes it was difficult to hear all that he said. His skill as an operator was quite remarkable—he never made an unnecessary movement and appeared unhurried and deliberate; in fact he was a very rapid operator.

He retired from the staff of St. Thomas's at the age of 60, five months before the National Health Service Act became operative, and went to live in Hampshire, where he was extremely happy with his family and his house and garden. His services to Salisbury General Hospital, given in a purely advisory capacity, were greatly appreciated by all who benefited from them. He was a skilled craftsman, not only as a surgeon but also as a plumber and carpenter, and derived great enjoyment from these hobbies.

He married Miss Isobel Lyall in 1930 and she survives him, together with their two young children. All those who knew him will feel the loss of a true friend and a wise counsellor.—R. W. N.

We are indebted to Sir MAX PAGE for the following appreciation: B. C. Maybury was one of those intelligent and efficient people who do their full share of work in life with a minimum of self-advertisement—and this despite the fact that as a student he gained almost every prize and medal open to him and then proceeded to mount the surgical ladder steadily, except during some years of work at a casualty clearing station in the first world war. He was naturally a self-effacing and reticent man, and I think his close professional association with Sir George Makins and Sir Cuthbert Wallace caused him to develop a conservative and critical attitude towards surgical problems. He was a neat and speedy operator, and his mastery of the technique of abdominal surgery was generally recognized from the time of his casualty work in France till his full maturity at St. Thomas's. His clinical judgment was excellent, although as a teacher of the average student he was not popular. The more advanced student and the postgraduate, however, appreciated the sterling worth of his counsel. It is worth noting that among his patients were to be found many doctors and their relatives. "B.C." disliked committees and their works, but would attend if a matter which interested him was under discussion: he could then be strong in opposition if his convictions were challenged. He wrote little and then usually only under pressure from without; in his rare contributions in debate he spoke with authority and with a full grasp of his material. By his passing we may well regret the loss of one of the few remaining fully equipped surgeons of the past era.

C. F. MARTIN, M.D., C.M., F.R.C.C.

Dr. Charles F. Martin, formerly dean of the faculty of medicine and professor of medicine at McGill University, died in Montreal on October 28 at the age of 85. He was one of the leading medical men in Canada.

Charles Ferdinand Martin was born in Montreal and educated at Montreal High School and at McGill University, where he graduated in medicine in 1892. After a period of postgraduate study in Europe he returned to Montreal and was appointed lecturer on pathology and on medicine at McGill. He was also elected to the staff of the Royal Victoria Hospital in 1895. In time he became physician-in-chief there, and he remained on the consultant staff after his retirement in 1934. His contributions to medical literature reflected his interest in internal medicine and in medical education.

The medical school at McGill University owes much to Martin, who was professor of medicine and dean of the faculty from 1923 to 1936, and also acting principal of the university for a time. Much reorganization was undertaken during his tenure of office, and he persuaded many famous and able men to join him in his labours. In 1934 he collaborated with Dr. Wilder Penfield in founding the Montreal Neurological Institute. He played a leading part in the foundation of the Royal College of Physicians and Surgeons of Canada, and he served as president of the American College of Physicians (1928-9), the Association of American Medical Colleges (1929), and the Canadian National Commission for Mental Hygiene. In 1948 he was awarded the first Alfred Stengel Memorial Medal by the American College of Physicians, and only last June he received the Starr Award of the Canadian Medical Association for his work in furthering medical education in Canada.

Dr. WILLIAM MCINTYRE BROWN died on October 27 at his home at West Kirby, Cheshire, on his 83rd birthday. Born at Dublin in 1870, he was educated at University College, Liverpool, and took the degrees of M.B., Ch.B. of the Victoria University of Manchester in 1894. Soon after the foundation of the University of Liverpool in 1903 he received the corresponding degrees of the new university, proceeding to the M.D. in 1908. After graduation, he first held the appointment of house-physician at Liverpool Royal Infirmary, and then settled at West Kirby, remaining there in active practice until failing health forced him to retire in 1946. During the whole of this 50 years the welfare of his patients was his sole preoccupation. His skill and devotion gained him a large circle of patients and friends. He was one of the old type of practitioner who regarded his work as a privilege, and he could always find time to listen, advise, and comfort. His great kindness and sympathy towards all those in need of help will long be remembered.—P. B. P.

With the death on October 15 of Mr. W. BRITAIN JONES, of Middlesbrough, at the age of 76, the people of Tees-side have lost a well-known and much-loved personality. The son of the Rev. T. T. Jones, William Britain Jones was born at Rhymney, South Wales, on October 5, 1877. He received his medical training at University College, London, taking the London degrees of M.B., B.S. in 1909. After graduation he held a house appointment at Ashton-under-Lyne Infirmary, and in 1911 moved to Middlesbrough to become house-surgeon to the North Ormesby Hospital. Later he became honorary surgeon to the hospital and medica

superintendent and surgeon to the Municipal (now General) Infirmary, Middlesbrough. Apart from his hospital operating sessions and his work in private practice as a consulting surgeon, he devoted his life to the development of the General Hospital: its present high status owes much to his foresight, energy, and administrative powers. He was a quick and brilliant surgeon, and in spite of a very busy life he always found time to help a younger man in difficulties, he always approached with patience and tact. He had the welfare and training of his nurses very much at heart, and many of them owed much to his interest and help. A great individualist with marked personality, he never took kindly to red tape and unnecessary form-filling, and was never at a loss for most expressive language in which to voice his opinion. He was chairman of the Clevedon Division of the B.M.A. for a short time in 1940. A keen student of many subjects besides surgery, he took an intelligent interest in psychic phenomena and gave popular lectures thereon, for he was a gifted and fluent speaker. He leaves a widow, one daughter, and two sons.—J. E. M. P.

Dr. F. H. ALEXANDER, of Angmering, died on October 29 at the age of 77. He was one to whom B.M.A. members in Sussex owed so much. His brief fatal illness started within two hours of his last attendance at a meeting of the Sussex Branch council, of which he had been a member since 1927; a few months ago he had a long and painful indisposition resulting from an injury sustained in his efforts to attend the annual general meeting of the Branch (of which he was president three years ago). He had been an active member of the West Sussex (formerly Chichester and Worthing) Division for as long as records exist, and he attended meetings of the executive committee with the greatest regularity for 30 years. He was chairman of the Division in 1929-30 and vice-chairman in 1930-1, and he had represented it on the Representative Body continuously since 1935. Frederick Hugh Alexander was born on April 17, 1876, and received his medical education at University College Hospital, obtaining the conjoint qualification in 1902 and the London M.B. two years later. He was in general practice at Littlehampton from 1905 to 1935, with the exception of his period of service as a captain in the R.A.M.C. in the first world war, service which included the Gallipoli campaign. Later he took a great interest in the British Legion and was a founder member of the Littlehampton branch and vice-president of the Sussex council. He was for many years divisional surgeon to the St. John Ambulance Brigade and was responsible for its reorganization and the invigoration of its activities in the Littlehampton area. Keen on sport of all kinds, he was for some time captain of the local hockey club and a vice-president of the cricket club, but in later years his own recreations were fishing and golf. He retired from practice in 1935 to Angmering, where he was a churchwarden and active in all village affairs. Throughout his life in Sussex he was universally admired for his gentleness and unassuming manner and for his unfailing kindness to all who approached him.—T. P. M.

The treasurer of the Medical Defence Union writes: Your admirable obituary notice (*Journal*, November 7, p. 1051) of "BILL" TUCKER (senior) prompts me to record an almost unknown incident connected with him. It happened in 1905 that I was medical officer on a steamer which called at Bermuda, so naturally I called on Tucker, for he and I had many times played football together. He gave me an excellent lunch, and that was the last time I saw him. Shortly after my return to England a man was apprehended who had been masquerading as Dr. W. E. Tucker and committing numerous frauds in connexion with purchases and sales of practices. One of the prosecution's needs was to prove that this man was not the man he pretended to be: somehow or other the late Dr. A. G. Bateman, then secretary of the

Medical Defence Union, heard that I had recently been in Bermuda and "tipped off" Scotland Yard to that effect. I was thereupon visited by a C.I.D. officer, who questioned me as to my movements. On hearing that I had actually been Tucker's guest only two or three months before, he said, "You are the man we need," and promptly arranged to subpoena me to appear as a witness at the forthcoming Warwick Assizes. The prisoner, who incidentally was a man of about 60 and a bigamist to boot, had the nerve to cross-examine me when I declared in court that he was not the William Eldon Tucker whose name appeared in the *Medical Register*; but, as has been demonstrated recently in other cases, to attempt to shake a witness who knows he is telling the exact and literal truth does not really help a defendant's case, and he was duly sentenced to three years' imprisonment. I at once joined the Medical Defence Union and have been a member ever since.

Dr. HUGO BOGER, who died on October 29 in the Hospital of St. John and St. Elizabeth at the age of 61, was the son of Dr. Hugo Boger, a medical practitioner who had a large general practice at Beni, in Bolivia. He was born at Reyes, Bolivia, on December 8, 1891, and was educated at St. Joseph's College, Norwood, becoming a medical student at University College Hospital during the first world war. In his final years there he worked single-handed as surgical dresser and unqualified house-surgeon to the late Mr. Wilfrid Trotter. He was captain of both the U.C.H. and the United Hospitals association football teams. After qualifying M.R.C.S., L.R.C.P. in 1922, he started a general practice among the South American and Spanish residents of London. In 1940, at the height of the air raids on London, he courageously took over a panel practice in Paddington because he wished to assist the country in which he had been resident for so many years. He liked panel practice so much that he continued it up to a few weeks before he was admitted to hospital as a patient. He was Vice-Consul for Bolivia in London for twenty-four years. Dr. Boger bore a striking resemblance to the late Henry Ainley, the actor, for whom he was frequently mistaken in the street. He leaves a widow, formerly Miss Dorothy Treadwell, a son, and a daughter.—A. M.

Dr. P. G. CARNEY, who died at his home at Clonskeagh, Dublin, on November 8 at the age of 63, had a distinguished career in the R.A.M.C. in both world wars. Born at Cootehill, County Cavan, in 1890, Philip Gerard Carney was educated at St. Mary's College, Dundalk, and at University College, Dublin, graduating M.B., B.Ch. of the National University of Ireland in 1914. After holding a resident appointment at the Mater Misericordiae Hospital, Dublin, he entered the R.A.M.C. in 1915 and served in France until 1918. He was awarded the Military Cross and the Croix de Guerre, with palm, in 1918 and for his war service he was admitted to the honorary degree of M.Sc. of the National University of Ireland in 1919. He then took a permanent commission in the R.A.M.C. and served in the Punjab and on the North-West Frontier of India until 1923, when he retired from the Army for family reasons. On return to civilian life he entered private practice at Cootehill, becoming district medical officer for the area in 1924. He re-entered the R.A.M.C. on the outbreak of the second world war in 1939 and saw service in France, the Middle East, and Greece until 1945, being mentioned in dispatches in 1944. Most of his time was spent in the Middle East, where he commanded a field ambulance in the second Libyan campaign against Rommel, and for two years he commanded the 53rd General Hospital at Haifa. He was released from the Army in 1945 with the rank of lieutenant-colonel and returned to his practice at Cootehill and to his duties as district medical officer until failing health forced his retirement in 1951. His outstanding personal qualities were simplicity and an unfailing kindness

and sympathy to everyone, especially the sick poor, by whom he was well loved. His intense interest in his work and his zeal for his patients never flagged, and if he had been less conscientious he might have been still alive. He died from arteriosclerotic hypertension. His chief hobbies were reading, archaeology, sailing on the broad lakes near Cootehill, and gardening.

Medico-Legal

DISTINGUISHING A PSYCHOPATH

During the trial at the Old Bailey on November 3 of Francis Wilkinson, 24, furnaceman, of Balham, who was sentenced to death for the murder of 5-year-old Miriam Susan Gray at the house where he was a lodger, Mr. Justice Hilbery queried the definition of the words "psychopathic personality."

Dr. Desmond Curran, psychiatrist, stated he had examined Wilkinson in Brixton Prison. "I have no doubt that Wilkinson should be regarded as the possessor of a psychopathic personality, or what is generally called an anomaly of character. I don't believe he is suffering from any mental disease."

The Judge asked what he meant by psychopathic personality. "I am collecting from various psychiatrists their definitions. Now, what is yours? *Psyche*, the soul, and *pathos*, illness: *sickness of the soul* I can appreciate; but what is your definition?"

Dr. Curran said he would read the definition as given by Dr. Denis Hill, who gave evidence before the Royal Commission on capital punishment. His definition was: "The diagnosis of psychopathic personality is made on persons of habitual abnormal behaviour, behaviour which has been abnormal from childhood; and the disorder of behaviour is seen in abnormal emotional reactivity, so that the individual who has it shows abnormal outbursts of temper, outbursts of emotional violence, and alcoholic excesses, often repeated, or suicidal attempts, and in some cases homicidal attempts."

The Judge: Does it mean the individual must exhibit all those things, those abnormalities, to be a psychopathic personality?

Dr. Curran replied he thought it was agreed that the individuals differed and there was no sharp dividing line.

The Judge: Every habitual criminal must be a psychopath if that is so.

Dr. Curran said he did not think every habitual criminal would show some of the features given in the definition.

The Judge: And what of abnormal behaviour? Do you agree normal behaviour is honest behaviour?—I don't know what is normal behaviour.

Mr. Christmas Humphreys (prosecuting): In the world of psychiatric medicine, is it right there is an elaborate classification of the disease of the mind?—Yes, there are many.

And in the study of psychiatric medicine there is at present a tendency to put into a new group those persons who do not suffer from a disease of the mind, but suffer from some form of character deficiency or emotional instability which makes it impossible for them to enter into normal contact with society?—Yes.

So when you say he is a psychopath, you are inferentially saying he is distinct from a person suffering from a distinct disease of the mind?—Yes.

Not within M'Naghten Rules

Dr. J. C. McL. Matheson, principal medical officer at Brixton Prison, who was called by the prosecution, said he agreed with Dr. Curran in that Wilkinson could be called a psychopath. He was not suffering from any mental disease which would bring him within the M'Naghten rules. But Wilkinson was abnormal.

The Judge: He is a misfit?—Yes.

The Judge ruled that there was no evidence that Wilkinson was suffering from a disease of the mind which would bring him within the M'Naghten rules.

According to the prosecution, Wilkinson, early on the morning of August 15, went into the kitchen where Miriam was sleeping, shone a torch on her, and hit her with the leg of a chair, fracturing her skull. He then made an attempt to assault her sexually.

Wilkinson's mother, Mrs. B. Wilkinson, said that her son had always been restless and could not sleep at night. No one would sit beside him in a cinema because he would disturb them by his restlessness. When he was 8 or 9 he had a great shock when he found a newborn baby torn in half in a dustbin. She found that one day he had broken a mirror because he could not bear to see himself; afterwards he told her he had not known he had done it. His father could not get on with him, and she broke the home up by leaving. She left because she could not stand it any longer.

Notice of appeal has been lodged.

Medical Notes in Parliament

LORDS' VIEWS ON SMOG

LORD AMULREE turned the attention of the House of Lords on November 18 to smog, describing its dangers to health and urging that action should be taken to prevent or minimize its occurrence, with particular reference to the extended use of smokeless fuel. In the severe fog of December, 1952, between 4,000 and 5,000 people died from the effects of the fog. There was also a big increase in the sickness rate.

The reason why the fog of 1952 was more dangerous than any suffered before was that there was a much greater concentration of sulphur dioxide in the air. It seemed that there was some kind of correlation between the sulphur dioxide content of the air and deaths from fog. More important was what could be done to stop the occurrence of fogs in future. Obviously it was going to take a long time, but one would like to know that the Government and local authorities were aware of the problem and doing something to meet it. What was being done, for example, to increase the use of smokeless fuels, which would go far to solving the fog question in general, and the formation of smokeless zones? A large range of industries was exempted from the powers given under the Public Health Act, 1936, but a firmer line should surely be possible in 1953. A new factor in London was the erection of power stations, of which there were nine on the banks of the Thames, in the valley where the worst conditions making for fog would occur. He was told that 97% efficiency could be obtained in washing the fumes. The solid part was efficiently extracted, but what was evil to health was the fumes. The N.H.S. fog masks, he thought, would not be of much value in dealing with the tiny particles, which could get round the corners of the mask and penetrate the gauze.

LORD HADEN-GUEST said it was calculated that 5,000,000 tons of domestic coal were consumed in Greater London during the six winter months. That sent into the atmosphere from 800 to 1,000 tons of smoke a day, 2,000 to 3,000 tons of sulphur dioxide a day, and up to 2,000 tons of carbon monoxide a day. One of the difficulties in the way of effective action was the simple administrative one that there was no single authority in London to control smoke pollution. The L.C.C. were taking preliminary steps to facilitate the formation of such an organization.

The EARL OF LISTOWEL mentioned some remedial measures which the L.C.C. would include in evidence to be submitted to the Beaver Committee. The first was to provide the public with information about the damage caused by fog. How many, for instance, knew that smokeless fuels gave off as much sulphur as coal or coke, or that fuel oil gave off half as much sulphur again as an equal weight of coal or coke? Even if there were smokeless zones the main evil of sulphur remained without a remedy. People contemplating the construction of new power stations must surely in the light of the second fact pause

for thought. Within an area of 20 square miles in London there were three large power stations—Battersea, Fulham, and Lotts Road—which burned 60% of all the coal used in the area. There was a lack of basic data from which firm conclusions could be drawn. A serious difficulty about washing the smoke was its expense.

No Authoritative Pronouncement

The EARL OF SELKIRK, Paymaster-General, said that the provision of smokeless fuel was only part of a big and intractable problem of long standing. Even were the atmosphere cleared of smoke there would still remain the problem of the colourless gases, sulphur dioxide and carbon monoxide. They were not yet in a position to make an authoritative pronouncement. Roughly half the smoke came from industrial plant, and the other half from the 16 million domestic grates. Only about a quarter of these grates could use coke, the only smokeless fuel available in any quantity. The high-grade smokeless fuels cost half as much again as coke, and unless their cost could be brought within the reach of the average householder there was no prospect of their making more than a small contribution to smoke abatement. He deprecated the banking up of coal fires at night, particularly in foggy weather, and said the Government would like that to be known. The cleansing of flue gases at power stations was a difficult subject. It was done at Battersea before the war, but there was no statutory obligation to carry it out. It was expensive, and not entirely satisfactory. The Beaver Committee would be making an interim report, which would be available in a few days' time.

Foreign Doctors and Dentists

MR. RAYMOND GOWER asked the Minister of Health what steps had been taken to employ the services of foreign doctors now domiciled in this country. MR. IAIN MACLEOD stated on November 19 that foreign doctors who had secured registration by the General Medical Council and who were domiciled in this country could, and did, take part in the National Health Service on equal terms with their British colleagues.

Doctors' Surgeries

MR. A. BLENKINSOP asked the Minister of Health on November 19 what action he had taken to help secure an improvement in the condition and equipment of general practitioners' surgeries and waiting-rooms. MR. IAIN MACLEOD said he understood that the chairman of the General Medical Services Committee of the B.M.A. wrote last month individually to all the 20,000 or so general practitioners taking part in the Health Service calling their attention to their responsibilities in providing a proper standard of surgery and waiting-room. He proposed to await the results of this approach.

Retiring Age

MR. WILLIAM BLYTON asked the Minister of Health on November 19 whether, in view of the Government policy of encouraging people to continue working instead of taking a pension, he approved the action of a regional hospital board in terminating the contract of a doctor medical superintendent at the age of 60 years without consulting the hospital management committee principally concerned, who were desirous of retaining their medical superintendent. MR. IAIN MACLEOD stated that under the terms and conditions of service of hospital medical staff a hospital doctor's regular contract came to an end when he was 65 (or 60 if he was a mental health officer), but his employing authority might retain him temporarily after that age. No approval on the Minister's part was needed.

Nerve Gas Experiments

MR. IAN WINTERBOTTOM asked the Parliamentary Secretary to the Ministry of Defence what special inducements were offered to Servicemen to take part in dangerous experimental

work, such as research into nerve gases. MR. NIGEL BIRCH, replying on November 17, said that volunteers for special types of experimental work, including chemical warfare research, were paid sums which varied between the different kinds of experiments. This extra pay was normally at the rate of between 10s. and 15s. a week. The men were volunteers, the nature of the experiment was clearly explained to them, and they were given a chance to withdraw. There had been only one fatal accident since 1922.

Private Members' Bills

Among 19 Bills presented by private members in the House of Commons on November 18 was one by Colonel M. Stoddart-Scott "to make it compulsory for the exchange of certificates of medical examination between persons before marriage." The second reading was fixed for March 26, 1954.

There were also a Coroners Bill, "to amend the law on the fees and allowances payable by coroners to witnesses, to persons summoned to attend as witnesses, and to medical practitioners making post-mortem examinations by the coroner's direction or at the coroner's request (for February 12); an Animals (Cruel Poisons) Bill, to prohibit the killing of animals by strychnine or other cruel poisons, and to amend the Pharmacy and Poisons Act, 1933 (for March 12); a Protection of Animals (Anaesthetics) Bill, to repeal the Act of 1919 and to extend the provisions of the Protection of Animals Acts in relation to the performance of operations on animals (for February 12); and a Safety in Employment (Inspection and Safety Organization) Bill, to ensure the representation of employees in the establishment and maintenance of conditions of safety and health in employment, which is supported by Dr. A. D. D. Broughton and Dr. Barnet Stross (for February 26).

Industrial Diseases Benefits

The House of Commons gave an unopposed second reading on November 23 to the Industrial Diseases (Benefit) Bill. MR. O. PEAKE, Minister of Pensions and National Insurance, explained that it extended the provisions of the Pneumoconiosis and Byssinosis Benefit Act, 1951, to cases of partial disablement. A large number of persons had failed to get compensation either under the Workmen's Compensation Acts or the industrial injuries scheme for two reasons; many had contracted pneumoconiosis before it was covered under the Workmen's Compensation Acts, and others leaving the prescribed industries had failed to prove their disablement within the time limit. It was believed that 15,000 cases were likely to succeed under the Bill. A flat rate of payment equal to one-half the rate payable for total disablement under the 1951 Act was proposed. It was estimated that in a full year the charge on the industrial injuries fund would be £750,000 for pneumoconiosis patients and about £50,000 to £60,000 for other diseases. The total cost would be about £1,500,000 a year, which would tend to diminish annually.

Dr. EDITH SUMMERSKILL welcomed the Bill on behalf of the Opposition. Dr. BARNET STROSS urged the need of a comprehensive cover to ensure that every human being was safeguarded if he was rendered ill or crippled by his occupation. Dr. H. MORGAN protested that this was a petty measure, and ran away from the responsibility of doing justice to men in the mining industry.

Certain dental charges have been repealed by regulations. They were imposed under the National Health Service Act, 1951. The charges concerned are those on dentures supplied as part of a course of clinical dental teaching at certain teaching hospitals. These are Guy's Hospital, King's College Hospital, the United Newcastle-upon-Tyne Hospitals, the United Leeds Hospitals, and the United Liverpool Hospitals. The regulations are the National Health Service (Remission of Dental Charges) (No. 2) Order, 1953.

Universities and Colleges

UNIVERSITY OF OXFORD

Sir Howard Florey, F.R.S., has been appointed the representative of the University on the governing body of the Lister Institute of Preventive Medicine.

Dr. A. G. McD. Weddell has been appointed delegate of St. Catherine's Society on the Hebdomadal Council.

In Congregation on August 1 the degree of B.M. was conferred on N. F. Brooks, J. W. Pearson (in absence), and Josephine Bradford (in absence).

UNIVERSITY OF CAMBRIDGE

The following appointments are announced: Dr. D. H. M. Woolham, University Lecturer in Anatomy; Dr. G. F. Roberts and Dr. B. M. Herbertson, University Lecturers in Pathology; Dr. A. P. Waterson, University Demonstrator in Pathology; and Dr. R. A. Parker, University Assistant Pathologist to Addenbrooke's Hospital, all with tenure from October 1, 1953, for three years.

In Congregation on August 1 the following medical degrees were conferred:

M.D.—*D. O'Brien, E. J. Holborow, B. H. Vawdrey, J. Gloster, E. G. Pyn, L. D. Osler, F. J. Y. Wood.

M.B., B.CHIR.—*P. M. O. Massey, W. B. Hepburn, E. D. Williams, Mrs. Esther S. Kerr.

*By proxy.

UNIVERSITY OF LONDON

Sir Archibald Gray has been reappointed a Crown Member of the Court of the University for a further period of five years from October 1, 1953.

The following have been nominated, appointed, or reappointed as representatives of the University on the governing bodies indicated in parentheses: Sir Archibald Gray, Dr. C. F. Harris, and Dr. Andrew Topping (British Postgraduate Medical Federation); Sir James Paterson Ross (Guy's Hospital Medical School); Professor Dorothy Russell (Institute of Ophthalmology); Dr. H. B. May and Professor H. R. Robinson, F.R.S. (Queen Mary College); Dr. M. I. A. Hunter and Professor J. Whillis (Royal Dental Hospital of London, School of Dental Surgery); Professor J. Z. Young, F.R.S., and Mr. E. G. Slesinger (St. George's Hospital Medical School); Professor W. C. W. Nixon (St. Mary's Hospital Medical School); Mr. J. P. Hedley (St. Thomas's Hospital Medical School); Sir Charles Harington, F.R.S., and Sir Archibald Gray (University College Hospital Medical School); Professor R. Hare (Wright-Fleming Institute of St. Mary's Hospital Medical School); Professor R. V. Christie (Inter-university Council for Higher Education in the Colonies).

The following have been recognized as teachers of the University in the subjects indicated in parentheses: St. Thomas's Hospital Medical School, Dr. J. G. Bourne (Anaesthetics); Dr. J. M. Tanner (Physiology). St. Bartholomew's Hospital Medical College, Mr. I. M. Hill (Surgery). Royal Free Hospital School of Medicine, Mr. J. C. R. Hindenach (Orthopaedics). London Hospital Medical College, Mr. J. E. Richardson (Surgery). St. Mary's Hospital Medical School, Dr. H. L. Thornton (Anaesthetics); Dr. W. F. Widdas (Physiology). University College Hospital Medical School, Mr. H. R. I. Wolfe (Surgery). University College, Dr. D. H. L. Evans (Anatomy). Dr. D. N. Baron has been granted probationary recognition for two years from July, 1953, as a teacher of pathology (chemical pathology) at Middlesex Hospital Medical School.

The title of Professor Emeritus of Physics in the University has been conferred on Professor H. R. Robinson, F.R.S.

The following candidates have been approved at the examinations indicated:

M.D.—Part I: Marion M. Ashforth, Marie J. Bouton, W. Brumfit, P. H. Connell, H. Foster, P. Glasman, J. F. Horley, P. J. Koblenzer, F. H. Lumb, T. G. Paxon, J. C. Pond, H. R. C. Riches, J. J. Segall, B. Strickland.

M.S.—Part I: C. I. Cooling, E. L. John.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Faculty held on September 7, with Dr. Andrew Allison, President, in the chair, E. Armitage and S. Sachdev were admitted Fellows of Faculty *qua* physician and R. S. Cowie was admitted a Fellow of Faculty *qua* surgeon.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending November 7 (No. 44) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	18	2	7	0	1	29	3	12	1	1
Dysentery ..	358	71	206	1	1	413	18	95	0	0
Encephalitis, acute ..	10	1	1	0		2	1		0	
Enteric fever:										
Typhoid ..	3	0	1	0	1	8	1	0	1	0
Paratyphoid ..	9	4	0	0	1	7	2	1 (B)	0	0
Food-poisoning ..	138	16		0		85	7		0	
Infective enteritis or diarrhoea under 2 years ..					15				11	22
Measles*	1,030	31	25	14	49	11,223	1252	154	51	63
Meningococcal infection ..	21	2	12	0		34	3	19	4	1
Ophthalmia neonatorum ..	26	2	4	0		38	3	10	0	
Pneumonia†	506	33	153	3	3	575	48	292	1	1
Poliomyelitis, acute:										
Paralytic ..	60	1	16	3	8	65	3	6	2	6
Non-paralytic ..	34	3				21	1			
Puerperal fever‡	205	20	12	0	1	259	43	10	2	1
Scarlet fever ..	1,187	58	217	22	74	2,094	120	345	27	84
Tuberculosis:										
Respiratory ..			157	35				160	25	
Non-respiratory ..			22	10				20	4	
Whooping-cough ..	2,175	135	293	40	33	1,449	77	83	32	84

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	3	1		0		1	1		0	
Encephalitis, acute ..		0			0		0		0	
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	6	0	0	2	5	6	1	2	0	0
Influenza ..	14	2	1	0	0	11	0		0	0
Measles ..		0	0	0	1		1		0	0
Meningococcal infection ..		0	0				0			
Pneumonia ..	212	32	15	11	8	200	25			5
Poliomyelitis, acute ..	7	0	1		0	1	0			0
Scarlet fever ..		0	0	0	0		0		0	1
Tuberculosis:										
Respiratory ..	96	10	13	4	3	94	8	8	3	9
Non-respiratory ..		0	1	2	2		2	5	0	0
Whooping-cough ..	4	0	0	0	0	1	0		0	0
Deaths 0-1 year ..	195	21	21	7	29	211	19	37	7	8
Deaths (excluding stillbirths) ..	5,193	723	533	114	159	5,027	714	588	87	140
LIVE BIRTHS ..	6,950	985	833	185	398	7,212	1099	865	175	355
STILLBIRTHS ..	178	21	25			182	22	19		

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

Vital Statistics

Trichinosis in Liverpool

Professor Andrew B. Semple, Medical Officer of Health for Liverpool, reports that up to the week ending November 21 some 68 cases of trichinosis had occurred in the Liverpool area over the previous two weeks. Eighteen of these patients have been admitted to hospital. Most of the cases are mild, but three patients are seriously ill. The source of the infection has been traced to a sausage factory in the city, and investigations are still proceeding to trace back the infection further. Nearly all the persons affected give a history of eating raw sausage meat. Further cases are still being found, and there is no evidence that new infections are occurring.

Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending November 7 were increases of 188 for measles, from 842 to 1,030, and 108 for whooping-cough, from 2,067 to 2,175.

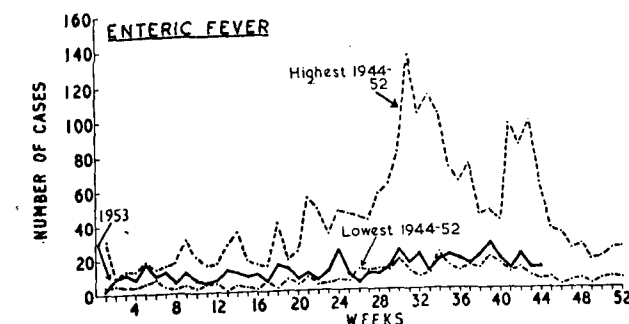
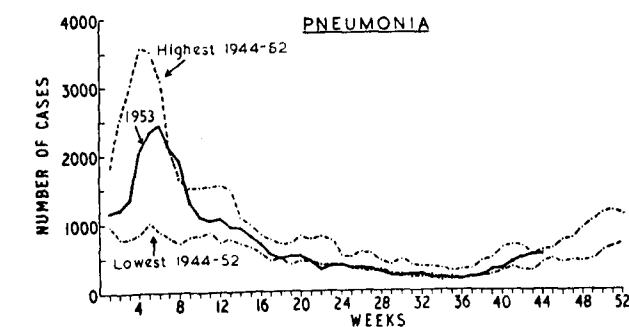
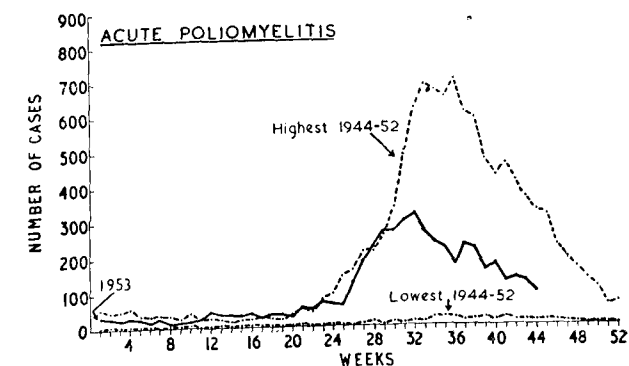
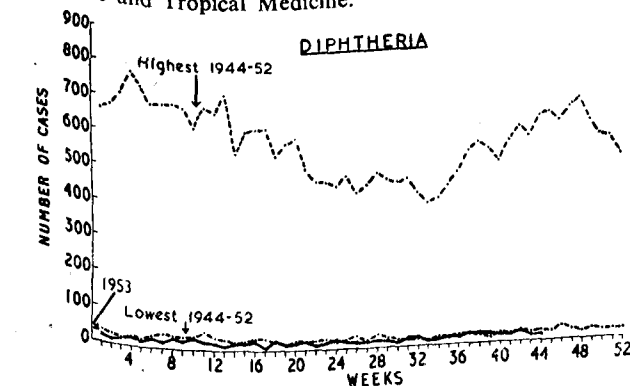
The largest rise in the incidence of measles was 73 in Cumberland, from 55 to 128, due to the outbreak in Workington M.B., where the cases rose from 51 to 121. The other large rises in measles were 42 in Lincolnshire, from 9 to 51 (mainly due to an outbreak with 32 cases in Horn-castle M.B.), 43 in Lancashire, from 205 to 248, and 36 in Yorkshire West Riding, from 64 to 100. The largest rises in the notifications of whooping-cough were 42 in Lancashire, from 216 to 258, 38 in Surrey, from 53 to 91, and 37 in London, from 98 to 135. 1,187 cases of scarlet fever were notified, being 39 fewer than in the preceding week; the largest decrease was 29 in London, from 87 to 58. The number of notifications of diphtheria was 18, the same as in the preceding week. The notifications involved nine counties, compared with only four in the previous week. The chief features of the returns were decreases in Staffordshire from 9 to 5 and in Lancashire from 7 to 2.

94 cases of acute poliomyelitis were notified; these were 28 fewer for paralytic and the same number for non-paralytic cases as in the preceding week. The largest returns were Lancashire 15 (scattered over 13 administrative areas); Wiltshire 9 (Calne and Chippenham R.D. 3, Highworth R.D. 3); Warwickshire 6; Yorkshire West Riding 6.

358 cases of dysentery were notified, 36 fewer than in the preceding week. The largest centres of infection were London 71 (Greenwich 12, Islington 10); Yorkshire West Riding 62 (Bradford C.B. 40); Lancashire 51 (Bolton C.B. 34); Yorkshire North Riding 28 (Middlesbrough C.B. 27); Essex 17; Middlesex 16.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending November 14

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,400, whooping-cough 2,410, diphtheria 26, measles 816, dysentery 370, acute poliomyelitis 95, paratyphoid fever 1, and typhoid fever 1.

The Services

The name of Captain M. A. Lerner, R.A.M.C., appears in a list of those mentioned in dispatches in recognition of gallant and distinguished services in Malaya, during the period January 1 to June 30, 1953.

The President of the U.S.A. has bestowed the decoration of Legion of Merit, Degree of Legionnaire, upon Surgeon Captain T. B. Lynagh, R.N., for distinguished services in operations in Korean waters.

The *London Gazette* has announced the following awards by the President of the U.S.A. in recognition of gallant and distinguished services during the operations by the United Nations in Korea:

Legion of Merit, Degree of Legionnaire.—Colonel G. Anderton, O.B.E., late R.A.M.C., (now R.A.R.O.).

Bronze Star Medal.—Captain H. I. Jory, R.A.M.C.

The *London Gazette* has announced the award of (a) the Army Emergency Reserve Decoration and (b) First Clasp to the Army Emergency Reserve Decoration to Major R. F. Lawrence, R.A.M.C., retired.

Surgeon Commanders R. I. Bence, D.S.C., R.N.V.R., C. K. Churches, and S. A. Sewell, R.A.N.R., and S. L. Townsend, R.A.N.V.R., and Surgeon Lieutenant-Commander J. R. H. Peat, R.N.V.R., have been awarded the Royal Naval Volunteer Reserve decoration.

Medical News

Rabbit Myxomatosis.—The danger of this disease to laboratory rabbits kept for experimental purposes is pointed out in Newsletter No. 7 of the Laboratory Animals Bureau, M.R.C. Laboratories, Hollyhill, London, N.W.3. Vectors of the disease include mosquitoes and midges, and they should be prevented from entering rabbit houses by the proofing of windows and other openings. Airlock doors are needed, outer garments and footwear have to be changed by those entering the rabbit houses, and insecticides may be useful. Diseased rabbits should be killed immediately, the carcasses burnt, the cages disinfected, and contacts isolated for seven days. A strong immunity to myxomatosis, lasting for at least 12 months, can be conferred by vaccination with the Boerlarge strain of the Shope fibroma virus. The Bureau cannot say where the vaccine is to be obtained until the Carrington Committee investigating the Kent outbreak has reported.

Dr. Ludwig Guttmann, director of the spinal injuries centre at the Ministry of Pensions' Stoke Mandeville Hospital, has been awarded the rehabilitation prize of the World Veterans Federation. He is its first recipient. Dr. Guttmann was born in 1899 in Upper Silesia, and graduated at Freiburg University in 1924. By 1937 he had become medical director of the department of neurology and neurosurgery at the Jewish Hospital, Breslau, but in 1939 the policy of the Germans compelled him to leave. He then came to Oxford and worked on nerve regeneration. At the end of 1943 he was asked to start a spinal unit at the Ministry of Pensions Hospital, Stoke Mandeville. He was awarded the O.B.E. in 1950.

Help for Visitors.—A memorandum outlining social facilities for visitors from Canada and the U.S.A. is obtainable from Dr. G. Wolstenholme, Director, The Ciba Foundation, 41, Portland Place, London, W.1. The Horse Shoe Club exists to foster friendship and exchange of medical research and clinical workers between Canada, the U.S.A., and Britain. Details may be obtained from the hon. secretary, Dr. C. S. Nicol, St. Bartholomew's Hospital, London, E.C.1. The Society for Visiting Scientists aims to exchange ideas between scientists of Britain and those from overseas. It provides food and accommodation. Particulars may be obtained from Miss E. Simpson, assistant secretary of the Society, 5, Old Burlington Street, London, W.1. The Ciba Foundation, a trust independent of the pharmaceutical firm, arranges scientific conferences and also provides accommodation for visitors from overseas. Full information can be obtained from the Director, Dr. G. Wolstenholme, at the address above.

United Hospitals' Festival Choir.—The choir, conducted by Colin Ratcliffe, is to give two concerts next year at the Royal Albert Hall: the first is Mozart's "Requiem," with the Philharmonia Orchestra, on January 20, and the second (probably Verdi's "Requiem") with the London Symphony Orchestra on June 3. Rehearsals are held every Thursday between 8 and 10 p.m. at the Church of the Most Holy Trinity, Brompton. Membership is open to anyone who works in any capacity in any hospital, and applications will be considered from anyone who has done so in the past. There are vacancies for all voices. Requests for membership should be directed to the Choir Secretary, Flat 1, 93, Lexham Gardens, London, W.8.

Thunberg Memorial Volume.—Supplement 111 of *Acta Physiologica Scandinavica* (1953, vol. 30) is a memorial volume to Torsten Thunberg, the distinguished Swedish physiologist and biochemist, who died in 1952. He occupied the chair of physiology at Lund University from 1905 to 1938. The volume includes an account of his scientific work, a full bibliography of his writings, a description of the great new Institute of Physiology at Lund, and a number of papers from Thunberg's Swedish colleagues and friends.

Family Doctor.—A timely warning against the dangers of fire at Christmas time appears in the new issue of *Family Doctor*, with advice on fire-guards and first-aid. A new series of "How to Live with your Nerves," by Dr. Walter C. Alvarez, of the Mayo Clinic, begins this month. Sir Russell Brain, P.R.C.P., gives an account of the Royal College of Physicians, London, and Dr. W. Edwards writes about the patient's protest that doctors never tell you anything in hospital.

COMING EVENTS

Pyrogens.—A symposium on the assay and detection of pyrogens will be held at University College, London, W.C.1, on Friday, December 11. Particulars may be obtained from Dr. K. R. Capper, Pharmaceutical Society of Great Britain, 17, Bloomsbury Square, London, W.C.1.

Internal Medicine Congress.—The third International Congress of Internal Medicine will be held in Stockholm from September 15 to 18, 1954. The president will be Professor Nanna Svartz, and the secretary-general Professor Anders Kristenson. The two main subjects for discussion at the congress will be the pathogenesis and treatment of hypertension, and the common characteristics of mesenchymal diseases (collagenous diseases) and their nature. Further information may be obtained from Third International Congress of Internal Medicine, Karolinska Sjukhuset, Stockholm 60.

NEW ISSUES

Journal of Neurology, Neurosurgery, and Psychiatry.—The next issue (Vol. 16, No. 4) will be available in a week's time. The contents will include:

THE BRAIN-STEM LESIONS IN PARKINSONISM. J. G. Greenfield and F. Dawn Bosanquet.
ROENTGENOLOGICAL EXAMINATION OF THE ARNOLD-CHIARI MALFORMATION WITH THE ZIESSER DES PLANTES PROCEDURE. H. Verbiest.
TEMPORAL LOBE EPILEPSY WITH PERSONALITY AND BEHAVIOUR DISORDERS CAUSED BY AN UNUSUAL CALCIFYING LESION. Murray A. Falconer and Desmond A. Pond.
SPINAL PATHWAYS SUBSERVING DEFECATION AND SENSATION FROM THE LOWER BOWEL. P. W. Nathan and Marion C. Smith.
SUBSTANCES WHICH SUPPORT RESPIRATION AND METABOLIC RESPONSE TO ELECTRICAL IMPULSES IN HUMAN CEREBRAL TISSUES. H. McIlwain.
THE SEX-RATIO IN CONVULSIVE DISORDERS WITH A NOTE ON SINGLE-SEX SIBSHIPS. Christopher Ounsted.
PROGNOSTIC FACTORS IN ELECTRIC CONVULSIVE THERAPY. Robert F. Hobson.
BOOK REVIEWS.
INDEX TO VOL. 16.

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

SOCIETIES AND LECTURES

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

Friday, November 27

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., clinical meeting for general practitioners. Mr. J. C. Hogg: Relationship Between Sinusitis and Chest Disease.

Saturday, November 28

WEST MIDLANDS PHYSICIANS ASSOCIATION.—At Queen Elizabeth Hospital, Birmingham, 11 a.m., autumn meeting.

Monday, November 30

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: lecture demonstration. LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Special University Lecture in Pathology by Professor J. R. Squire: Nephrotic Syndrome.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. B. G. C. Ackner: Management of Some Common Sexual Difficulties.

Tuesday, December 1

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. W. D. M. Paton: Anticholinesterases.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Professor C. A. Keele: Hyperhidrosis.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—4.45 p.m., Thomas Percy Legg Memorial Lecture by Mr. V. E. Negus: The Relationship Between Rhinology and Laryngology and the Thyroid Gland.

MIDDLESEX COUNTY MEDICAL SOCIETY.—At North Middlesex Hospital, 3 p.m., clinical meeting.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Arris and Gale Lecture by Mr. G. J. Hadfield: Effect of Hormones on Healing.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. H. K. Waller and Dr. R. Lightwood: Breast Feeding.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. B. C. Parsons-Smith: neurological demonstration.

Any Questions?

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

Causes of Failure of Contraceptive Diaphragms

Q.—What are the possible causes of failure of the diaphragm contraceptive cap? In the last year I have had 3 failures in 20 patients.

A.—The diaphragm contraceptive cap ("Dutch cap") is remarkably reliable in the experience of those who specialize in giving advice and instruction in contraception. It must, of course, be used in conjunction with an efficient spermicidal jelly, of which there are several preparations on the market.

Unaccountable failures are rare, and a failure rate of 3 in 20 cases strongly suggests some error in the fitting of the diaphragm, inadequate instruction of the patient in its use, or failure on the part of the patient to follow instructions implicitly on all occasions. It is not uncommon for a woman who conceives to deny any breakdown in technique, only to confess years later that she did in fact depart from instructions. The commonest causes for failure of an occlusive diaphragm are:

1. Incorrect placing of the cap by the patient. Many women require long and patient instruction and few can feel their cervix unless specially taught to do so. If the cervix cannot be felt by the patient a watch spring (instead of a coiled spring) diaphragm may be easier and safer to use. Even then there should be a periodic check by the doctor to make sure that she is inserting it correctly.
2. Removal of the cap too soon after coitus. There should be an interval of eight hours.
3. Use of the cap without a spermicidal preparation, or the practice of coitus several hours after its insertion without supplementing the spermicidal jelly.
4. Omission of the cap on isolated occasions; sometimes the patient even forgets she has not inserted it.
5. The cap may not fit as well as it appears to do when tested in the doctor's surgery. At that time the woman may be nervous and tense, whereas during coitus the pelvic muscles are relaxed.
6. Use of the cap in cases in which it is not suitable. The coiled-spring diaphragm, for example, is not reliable if the vaginal walls are lax and the anterior fornix is shallow; retroversion is a contraindication in certain cases.

Abortifacient Pastes

Q.—In "Pye's Surgical Handicraft" (1950, 16th edition, p. 386) *utus* (formerly *aretus*) paste is recommended as a simple and effective way of producing abortion up to about the sixteenth week. Is this a generally held opinion? If so, of what is the paste composed, and how is it applied?

A.—Abortifacient pastes of the type mentioned have been marketed on the continent of Europe, in the United States, and in Britain since about 1930. They consist essentially of alkaline soaps medicated with iodine and astringents. They have a strong haemolytic and cytolytic action, and act by chemical rather than mechanical irritation of and act by chemical rather than mechanical irritation of the uterine wall. The paste is injected (through the special cannula supplied with the tubes) into the lower part of the uterus, outside the membranes, the amount depending on the duration of pregnancy. Expulsion of the ovum generally takes place 24 to 36 hours after injection. Anaesthesia is not necessary, but the injection should be made slowly, without pressure, and with due regard to asepsis. If there is any pain or bleeding the injection should be stopped at once. The method should never be used during the first

Wednesday, December 2

EDINBURGH CLINICAL CLUB.—At Royal Hospital for Sick Children, Edinburgh, 4 p.m., clinical meeting. Dr. Margaret MacK. Methven: Case Conference in the Psychiatric Department.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Bullous Eruptions of the Skin.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. F. R. Kilpatrick: Tuberculosis of the Renal Tract.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Mr. A. Lawrence Abel: Present Position of the Cancer Problem.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—7.30 p.m., Professor A. D. Macdonald: Applied Pharmacology.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Sir Harold E. Whittingham: Hygiene and Sanitation in Aviation (illustrated).

SOCIETY OF PUBLIC ANALYSTS.—At Chemical Society, 7 p.m., Professor C. H. Gray: Recent Advances in Medical Chemistry.

Thursday, December 3

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. R. M. B. MacKenna: Scientific Approach to Dermatology.

CHADWICK TRUST.—At Wright-Fleming Institute of Microbiology, St. Mary's Hospital, 5 p.m., Malcolm Morris Memorial Lecture by Professor P. W. Windeyer: Radiotherapy in its Relation to Dermatology.

FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, 5 p.m., clinical evening.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Professor J. N. Davidson: A Biochemist Looks at the Cell.

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. E. B. French: Pigmentation.

INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY.—At National Hospital, Queen Square, W.C.1, 5.30 p.m., Dr. L. T. Hilliard: Mental Deficiency and Paralytic Syndromes.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—At Royal College of Surgeons of England, 5.30 p.m., Dr. Michael P. Ward: Ascent of Mount Everest: Medical Problems.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Symposium: Pathology of Tuberculosis.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., otolaryngology lecture by Dr. Michael P. Ward: Ascent of Mount Everest: Medical Problems.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Mr. V. E. Negus: Ciliary Action.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Denis Williams: neurology demonstration.

SOCIETY OF CHEMICAL INDUSTRY: MICROBIOLOGY GROUP.—At Medical Society of London, 6.15 p.m., papers by Professor M. Stacey, D.Sc., F.R.I.C., F.R.S., Mr. A. E. James, B.Sc., A.R.I.C., Dr. F. Fletcher, Mr. A. R. Lockwood, B.Sc., A.R.I.C., and Mr. A. W. Wilkinson on Dextran.

Friday, December 4

HEBERDEN SOCIETY.—At Royal College of Surgeons of England, 3.30 p.m., Heberden Oration for 1953 by Sir W. Russell Brain: Spondylosis: The Known and the Unknown.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. T. Brain: Diseases of Children.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—Professor Charles Wells: The Suprarenal Gland, its Surgical Significance in Health and Disease.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., film and commentary by Dr. R. G. Macfarlane: Marrow Puncture.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Dissertation by Mr. J. C. Guinard: Astronautical Medicine.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., debate. Motion: Corporal Punishment has no place in the Penal System of an Enlightened Society. Proposer, Mr. G. Benson, M.P.; Opposer, Dr. W. J. O'Donovan.

Saturday, December 5

MIDLAND TUBERCULOSIS SOCIETY.—At Birmingham Chest Clinic, Professor R. S. Pilcher: Bronchiectasis in Children.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Roads.—On November 13, 1953, at Shrewsbury, Salop, to Eve (formerly Daniel), wife of Peter Roads, M.D., a daughter—Gillian Mary.

Rugg-Gunn.—On November 20, 1953, to Patricia, wife of Surgeon Commander M. A. Rugg-Gunn, M.D., M.R.C.P., R.N., a son.

DEATHS

Barlet.—On November 4, 1953, at the French Hospital, London, W.C.1, Jehan Meredith Barlet, M.D., of Putney, London, S.W.

Blunt.—On November 10, 1953, at his home, Tyrrel Road, Chandler's Ford, Hants, Thomas Edward Blunt, M.R.C.S., L.R.C.P., Surgeon Captain, R.N., retired.

Cook.—On November 10, 1953, at Malvern Mill, Blockley, Glos, Robert Haldane Cook, M.D., aged 87.

Graham.—On November 6, 1953, Charles Lester Graham, M.B., Ch.B., J.P., of Netherby House, Wigan, Lancs, aged 67.

Henry.—On September 11, 1953, in Barbados, British West Indies, Arthur Martin Henry, M.R.C.S., L.R.C.P., L.D.S., Surgeon Lieutenant-Commander, R.N., retired, late of Chelmsford and Burnham-on-Crouch, Essex.

Luce.—On October 26, 1953, at her home, Milford, Surrey, Ina Marion Luce (formerly Clarke), F.R.C.S.I.

Shepherd.—On October 19, 1953, at his home, 27, Sea Lane, Goring-by-Sea, Sussex, Douglas Robert Chaplin Shepherd, M.B., B.S., M.R.C.P.

Stansfeld.—On October 24, 1953, at Brocklesbury, East Preston, Sussex, Dorothy Gales Stansfeld (formerly Parsons), L.M.S.S.A.

Sykes.—On October 30, 1953, at Glenbank, Kinross, Inverness-shire, Stanley Parkinson Sykes, M.B., Ch.B., Lieutenant-Colonel, R.A.M.C., retired, aged 67.

Watson.—On November 6, 1953, at his home, The Elms, Church Street, Wellingborough, Northants, Andrew Watson, M.B., F.R.C.S.Ed.

six weeks of pregnancy, otherwise the paste may escape past the small ovum and enter the Fallopian tubes and peritoneal cavity. The above instructions are based on those issued by manufacturers of these pastes.

The advantages of this method of inducing abortion are simplicity in technique and avoidance of anaesthesia. Although the method is often successful, reports indicate that the process of expulsion of the ovum is sometimes protracted for as long as five or six days, and operative interference to complete the abortion is required in 10 to 20% of cases. It is claimed that this method avoids such risks as rupture of the uterus and laceration of the cervix which attend other procedures. Nevertheless, such risks are not excluded, and cases of perforation of the uterus by the cannula are recorded. In early pregnancy at least, the paste may pass through the tubes and give rise to pain and collapse, and even peritonitis. At any time during pregnancy there is a real risk of endometritis and salpingitis, as well as extensive necrosis of the uterine wall. The paste can penetrate the myometrium, and can enter the chorio-decidual space and the blood stream to produce severe and sometimes fatal haemolysis. Fatal embolism, septicaemia, and kidney and liver lesions are all recorded, while non-fatal sequelae include chronic pelvic infection and sterility. Even when major complications are avoided, the bleeding following the abortion tends to be unusually heavy and prolonged.

Cases illustrating all these types of ill effects are described by R. W. Weilerstein,¹ who also gives many references in the Continental medical literature, all of which indicate the dangers of abortifacient pastes. By 1932 there were already reports of at least 25 fatalities in the German literature alone. In 1932 the American Medical Association published a report² calling the attention of the medical profession to the dangers of this method of inducing abortion, and the same journal has since given repeated warnings in its editorials.

It is only in recent years that the use of abortifacient pastes has received much attention in Britain, but they now appear to be obtaining adherents who are naturally attracted by the simplicity of the method and do not always appreciate the risks. These pastes are neither as safe nor as efficient as is often stated, but it has to be remembered that the same can be said of nearly all methods for inducing abortion. It is a matter of choosing the method which is least dangerous for any particular patient.

REFERENCES

- 1 *J. Amer. med. Ass.*, 1944, 125, 205.
2 *Ibid.*, 1932, 98, 215.

Sewage on the Garden

Q.—At a large military establishment near here the raw sewage is passed through "digesting" tanks, where it remains for 12 days. It is then dried for periods of one to six months, depending on the weather. After this treatment it is used for garden manure. What is the risk of amoebiasis or other intestinal disease as a result of contamination of fruit or vegetables?

A.—There is little risk of infection from this source. Amoebic cysts survive for only three to four weeks in water, and the higher the bacterial content of the water the shorter the life of the cyst. The practice outlined in the question is fairly uniform throughout the country, and no ill results are reported.

Cleft Palate

Q.—Does a cleft palate ever close spontaneously, or is an operation always indicated?

A.—A cleft palate never closes spontaneously; an operation is always indicated.

Curare and Peptic Ulcer

Q.—Is curare of any use in the treatment of peptic ulcer?

A.—I doubt if there is any scope for this drug in the management of peptic ulcer.

Suppositories for Hypnotics

Q.—In Switzerland it is not unusual to give hypnotics as suppositories. The idea is to prevent the cases of over-dosage which sometimes occur when hypnotics are taken by mouth. May I know your expert's opinion of this practice, and also a suitable prescription for giving a hypnotic in this way?

A.—The rectal administration of drugs is more popular on the Continent than in Britain. Except in certain special cases there is no particular advantage in administering drugs in this way. Anyone intent on taking an over-dose of barbiturates could swallow the suppositories and so produce the lethal effect. Thus the safeguard of rectal administration in this respect is slight, though perhaps there is less likelihood of suppositories being swallowed inadvertently than pills. Further, barbiturates can on occasion produce a very irritant effect on the rectum, and their rate of absorption is much more variable when administered in this unaesthetic way. Quinalbarbitone sodium ("seconal") is made up in suppositories containing 0.13 g., while the slightly longer-acting sodium amylobarbitone ("sodium amytal") is available in suppositories of 0.2 g.

Ergot Preparations and Migraine

Q.—Are any ill effects likely to follow the prolonged and frequent use of dihydroergotamine for migraine? A woman in her early forties is getting increasingly frequent attacks of migraine, and this drug affords the most certain relief of any remedies tried. Can dihydroergotamine be used prophylactically?

A.—Toxic effects from the use of ergotamine tartrate in the treatment of migraine are very uncommon, but occasional cases of ischaemic neuritis, gangrene of a finger, and exacerbation of anginal symptoms have been reported.¹ Dihydroergotamine is generally considered to be less toxic than ergotamine tartrate, and toxic effects from its repeated administration in migraine must be extremely rare. Dihydroergotamine may be used prophylactically, but the results are capricious, and its major value is when given at the first warning of an attack.

REFERENCE

- 1 *Proc. Mayo Clin.*, 1951, 26, 153.

Pendulous Breasts

Q.—What is the best way of dealing with breasts that have become unduly pendulous after breast-feeding?

A.—The most useful treatment is to ensure that the breasts are always kept well supported by a suitable brassière. Time alone will then probably improve matters. Exercise of the pectoral muscles—by breast-stroke swimming, for example—is sometimes advised, but is of doubtful value.

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

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 5 1953

AN EPIDEMIOLOGICAL STUDY OF RHEUMATOID ARTHRITIS ASSOCIATED WITH CHARACTERISTIC CHEST X-RAY APPEARANCES IN COAL-WORKERS

BY

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AND

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Members of the Scientific Staff, Medical Research Council, Pneumoconiosis Research Unit

[WITH SPECIAL PLATE]

A new syndrome has been described in coal-workers (Caplan, 1953) in which rheumatoid arthritis is associated with nodular fibrosis of the lung which is radiologically similar to, but distinguishable from, the massive fibrosis appearing in complicated pneumoconiosis. A syndrome which describes an association between two pathological conditions affecting different parts of the body is usually founded on a clinical impression but is rarely studied by epidemiological methods. Such methods may determine whether the association is more than a chance occurrence of the two conditions in the same subject. This paper describes an epidemiological study of rheumatoid arthritis in a community of coal-miners in South Wales to investigate this new syndrome.

Characteristic Chest X-ray Appearances

The radiological features of progressive massive fibrosis (P.M.F.) in coal-workers' pneumoconiosis have been fully described (Fletcher *et al.*, 1949). At the beginning, ill-defined opacities develop upon a background of category 2 or 3 simple pneumoconiosis; these gradually enlarge over a period of several years to produce irregular shadows which usually become more clearly defined; ultimately the masses may occupy most of a lobe and may be associated with distortion of surrounding structures and accompanied by emphysema. An example of the early stages of the development of such a shadow is shown in Fig. 1 (see Special Plate), and a typical example of advanced massive fibrosis is shown in Fig. 2.

The type of chest lesions associated with rheumatoid arthritis in miners is strikingly different in some respects. There is a much more rapid development of numerous discrete rounded opacities scattered diffusely throughout

both lung fields. These lesions seem to appear in crops, the lesions in each crop being similar in size and rate of development. Over a period of a few months they attain a diameter of 1-2 cm., occasionally as large as 5 cm., and thereafter as a general rule they change relatively little over a period of years; they may gradually enlarge, and cavitation may occur in them; occasionally they contract to form stellate scars or they may calcify. Characteristically these lesions develop upon a background of less simple pneumoconiosis than does typical P.M.F.: whereas P.M.F. rarely, if ever, starts when there is less than category 2 simple pneumoconiosis, these "rheumatoid" lesions are often seen with a background of only category 1. Fig. 3 illustrates a typical example of the "rheumatoid" type of chest x-ray picture in a coal-miner aged 40 with a history of rheumatoid arthritis for the past eleven years. The x-ray appearances described above have been noted only in men exposed to a dust hazard and have no similarity to the interstitial pneumonitis occurring in cases of rheumatoid arthritis described by Ellman and Ball (1948).

Planning of the Investigation

The chest x-ray films used in this study were all of miners or ex-miners examined in the Rhondda Fach, a South Wales mining valley where over 95% of the mining and ex-mining population had been x-rayed (Cochrane *et al.*, 1952). In 896 cases these films had previously been classified as showing either P.M.F. (788) or clinically significant tuberculosis (108); from this group Caplan, as the first observer of the syndrome, selected all films showing the radiological appearances which he thought would be associated with rheumatoid arthritis. Twenty such films were selected. These 20 cases and a randomly selected group of 60 controls,

stratified by age and chosen from the miners whose films had been read and discarded as showing none of the characteristic appearances, were visited at their homes by a physician who was not aware of the x-ray findings. When visiting these men, a standard questionnaire was used and all joints of the arms and legs were examined in cases in which the history suggested arthritis.

To check the reproducibility of reading the chest films, all 896 films were re-read by the same observer, and to determine the inter-observer error of diagnosis of rheumatoid arthritis in field-survey work another physician visited all selected cases and any controls who had shown some evidence of rheumatoid arthritis. This small study of intra- and inter-observer error is described in the Appendix.

All men considered by either physician to have rheumatoid arthritis, and the 20 cases selected because of their characteristic chest x-ray films, were more fully investigated later. A positive diagnosis of rheumatoid arthritis was made only when at least two of the following criteria were satisfied: (1) A typical history of symmetrical polyarthritis with or without residual deformity; (2) characteristic changes of rheumatoid arthritis in the x-ray films of hands or feet; and (3) a positive differential agglutination test for rheumatoid arthritis (Rose *et al.*, 1948).

In this investigation we were particularly keen to miss no cases of rheumatoid arthritis, and as a consequence several of the men considered to be doubtfully positive when seen at their homes when investigated further either failed to fulfil the criteria or were proved to be suffering from some other arthritic condition.

Results

Prevalence of Rheumatoid Arthritis

The proportion of cases of rheumatoid arthritis found among the control group of cases of P.M.F. or tuberculosis (3%) was greater than that reported in the normal population. In the Sickness Survey (Stocks, 1949) a prevalence of 0.419% among all males and females over the age of 16 was found, and in a recent investigation of rheumatism in coal-miners in Lancashire, Lawrence and Aitken-Swan (1952) reported less than 1% of cases in the same age groups, suggesting that the prevalence of this disease among miners is no higher than in the general population, but it should be noted that massive fibrosis itself is probably less common in Lancashire than in South Wales (unpublished data, Pneumoconiosis Research Unit).

As a higher prevalence of rheumatoid arthritis was found among cases of massive fibrosis than had been expected, it was clearly necessary to determine its prevalence in miners with and without simple pneumoconiosis, and two further groups were selected in the same way as the group with P.M.F. Several doubtfully positive cases in these other x-ray groups were also fully investigated, but with negative results. Table I shows the prevalence of rheumatoid arthritis in the four x-ray groups visited.

The prevalence is very much higher in the group with characteristic chest x-ray films than in any of the other three groups. Indeed, in these cases the diagnosis of rheumatoid arthritis could have been made from the chest x-ray films alone with more than a 50% chance of being correct. The prevalence of this type of arthritis also seems to be greater in cases of P.M.F. than in miners with simple pneumoconiosis or with chest x-ray films which show no signs of pneumoconiosis.

Table II is a summary of the clinical and x-ray findings of the 20 cases with characteristic x-ray appearances and of the two cases in the P.M.F. group, and shows those who were proved to be suffering from rheumatoid arthritis. It was found that there was no close correlation between the more

typical "rheumatoid" chest x-ray film and the activity, severity, and time of onset of arthritis, or between the chest x-ray films and the radiological evidence of rheumatoid arthritis in the hands and feet. The analysis by age, dust exposure, and somatotype does, however, reveal some points of interest.

TABLE I.—Prevalence of Rheumatoid Arthritis Among Miners and Ex-miners, Analysed by Chest X-ray Appearances

Clinical Findings	Chest X-ray Groups			
	Characteristic "Rheumatoid" Lesions	Progressive Massive Fibrosis or Clinically Significant Tuberculosis	Simple Pneumoconiosis	Normal
	No. (%)	No. (%)	No. (%)	No. (%)
Proved rheumatoid arthritis	11 (55%)	2 (3%)	—	—
No rheumatoid arthritis	9 (45%)	57 (97%)	92	112
Total	20 (100%)	59* (100%)	92	112

The difference between those with characteristic rheumatoid chest x-ray films and the control group of P.M.F. is highly significant. The difference in incidence between the P.M.F. group and the simple pneumoconiosis and normal group is exactly at the 5% level of significance. * One patient in this group had died in the interval between the x-ray survey and this investigation.

(a) Age.—The mean age of men with typical "rheumatoid" chest x-ray films and with arthritis was 48.9 years, compared with 41.5 years for those with similar chest films but without arthritis. This difference is not statistically significant ($0.10 < P < 0.20$). The "rheumatoid" lung lesions may precede the onset of arthritis by several years, as is discussed later, and it is possible that a number of men with typical x-ray films and without arthritis may develop it at a later date. The average age of onset of arthritic symptoms among the proved cases was 41.7 years.

(b) Total Dust Exposure.—The total duration of dust exposure has a mean of 22.6 years in the proved cases, as opposed to 16.3 years in those without arthritis. This difference is statistically significant ($0.01 < P < 0.02$). Age and total length of exposure to dust are of course correlated, and by making allowance for this fact it should be possible to throw some light on which is more closely related to the arthritis. The mean age of the proved rheumatoid arthritis cases can be compared with that of those without arthritis when the length of dust exposure has been allowed for, and, similarly, the duration of dust exposure standardized for age can be compared in the two groups. When this is done there is no significant difference between the two groups either in age ($0.60 < P < 0.70$) or in dust exposure ($0.10 < P < 0.20$), but whereas length of dust exposure, which previously was significant, now becomes just less than significant, all suggestion of a difference in age has vanished. Thus the dust exposure might be a factor differentiating the two groups, and age probably only so far as it is related to dust exposure. This difference, however, is not established with any degree of confidence.

(c) Stone Dust Exposure.—When analysed according to years of exposure to stone dust some interesting results are forthcoming. Taking the group with characteristic "rheumatoid" x-ray films and the control group of P.M.F. cases, we find there is no statistically significant difference between their exposure to stone dust, though it is possible that such a difference is present but not revealed in these relatively small groups. In the group with typical "rheumatoid" x-ray films, however, there are nine men who have had exposure to stone dust, and seven of these occur in the group of eleven who have proved rheumatoid arthritis. Two occur in the group without arthritis. The probability of this occurring fortuitously is 8%. Of these nine men, five have had a stone dust exposure of three years or more, and all these have rheumatoid arthritis. The probability of this occurring fortuitously is only 3%. The significance, if any, of this curious finding will be determined only when further cases of this syndrome are investigated. It is of interest to note that Collis and Yule (1933),

TABLE II.—Summary of Clinical Findings and Industrial Histories of 20 Cases with "Rheumatoid" Chest X-ray Films and 2 Cases with P.M.F.

No.	Age (Years)	History of Rheumatoid Arthritis	Differ- ential Agglu- tination Test (Rose)	X-ray Diagnosis of Rheumatoid Arthritis				Lowest E.S.R. (Westergren) mm. Fall in 1 Hour	Middlebrook- Dubos Agglutination Test (1:8 positive)	Somatotype Index	Age of Onset of Arthritis (Years)	Years of Dust Exposure Before X-ray			
				Hands		Feet						Stone	Stone and Coal	Coal	Total
				Observer	Observer	A	B								
Cases with Proved Rheumatoid Arthritis with "Rheumatoid" Chest X-ray Films															
1	72	+	+	3	3	3	3	40	—	107.8	47	—	—	34	34
2	60	+	+	2	2	2	2	36	+	114.4	58	8	—	26	34
3	58	+	+	1	2	2	2	39	—	99.4	48	—	—	22	22
4	50	+	—	1	2	0	0	30	—	111.5	45	3	—	19	22
5	49	+	—	1	1	0	0	6	+	105.3	47	18	—	9	27
6	46	+	+	0	0	0	0	20	N.R.	108.9	44	—	1	25	26
7	43	+	+	0	1	0	1	5	—	108.6	37	3	—	11	14
8	41	+	+	1	0	2	2	16	+	104.3	39	—	2	17	19
9	40	+	+	0	1	0	0	13	—	100.5	38	—	—	19	19
10	40	+	+	0	1	0	0	21	+	113.7	29	—	—	15	15
11	39	+	+	1	1	2	2	14	—	95.3	27	—	12	5	17
	Mean 48.9		72.7% positive					Mean 21.8	50% positive	Mean 106.3	Mean 41.7				Mean 22.6 yrs.
Cases without Proved Rheumatoid Arthritis with "Rheumatoid" Chest X-ray Films															
12	50	—	—	0	0	0	0	30	—	99.3	—	—	—	23	23
13	48	—	—	0	0	0	0	23	+	98.7	47(?)	—	—	15	15
14	45	+	(?)	0	0	0	0	4	—	105.5	—	—	—	20	20
15	44	—	—	0	0	0	0	7	+	111.7	—	—	—	20	20
16	40	—	—	0	0	0	0	1	—	105.6	—	—	2	12	14
17	39	—	—	0	0	0	0	6	—	99.4	—	—	—	13	13
18	38	—	—	0	0	0	0	5	+	105.3	—	1	—	19	20
19	35	—	—	0	0	0	0	56	—	100.0	—	—	—	10	10
20	35	—	N.R.	0	1	0	0	N.R.	N.R.	102.4	—	—	—	12	12
	Mean 41.5							Mean 16.5	37.5% positive	Mean 103.1					Mean 16.3 yrs.
Cases with Proved Rheumatoid Arthritis with P.M.F. Chest X-ray Films															
1	41	+	+	2	2	2	2	85	—	93.8	30	—	—	4	8
2	49	+	+	1	1	2	2	5	—	94.0	48	—	—	26	26

The readings of the x-ray films of the hands and feet are scored as follows: 0 = normal or doubtful changes of rheumatoid arthritis; 1 = minimal changes of rheumatoid arthritis; 2 = moderate changes of rheumatoid arthritis; 3 = marked changes of rheumatoid arthritis. N.R. = no record. * Observers A and B, see Appendix.

who analysed the Registrar-General's Decennial Supplement for 1921-3, found a remarkably increased mortality from a wide range of diseases in men exposed to a silica risk. This included a fourfold increase in the mortality rate from chronic rheumatic conditions.

(d) Somatotype.—It is often said that rheumatoid arthritis affects people of asthenic build. In this series anthropometric measurements were made, using the body index suggested by Rees and Eysenck (1945), which is

$$100 \times \text{stature in cm.}$$

$$6 \times \text{mean chest diameter in cm.}$$

Analysis shows that the group with typical "rheumatoid" chest x-ray films but without arthritis are similar in body build to the control cases with P.M.F., but those with arthritis have a higher mean "body index"—that is, they are of a more asthenic type. This difference may be a sampling effect, but if it is justifiable to assume that all the cases with typical "rheumatoid" chest films have some factor predisposing to the development of arthritis (see under Discussion) then this predisposing factor is not related to somatotype, and the difference in body build is probably secondary to the rheumatoid arthritis.

Clinical Investigations

Clinical examination, the x-ray appearances of peripheral joints, the erythrocyte sedimentation rate, and the differential agglutination test all indicated that the type of arthritis seen in these miners differs in no way from rheumatoid arthritis in other people. Of the 12 men who gave histories suggestive of rheumatoid arthritis, positive differential agglutination tests were obtained in eight. No positive result was obtained in any case without a history of polyarthritis. These findings agree with those found in other series of rheumatoid arthritis in males, and would not be expected in other arthritic conditions, with the possible exception of disseminated lupus erythematosus (Ball, 1952).

The Middlebrook-Dubos agglutination test was also carried out. This test, which is based on the agglutination by tuberculous patients' serum of sheep's red cells sensitized to tuberculin, seems to be of limited value except in research into the pathogenesis of tuberculosis, the false positives and false negatives being so numerous that the significance of the result in any individual case cannot be determined. In this series we found 8 positive results (agglutination to a titre of 1:8) in 18 sera tested (44%). In a series of 133 cases of early progressive massive fibrosis, agglutination to a titre of 1:8 occurred in only four cases (3%). This suggests that the lesions in the lungs are a form of tuberculosis, and there is other evidence which supports this, but both the Middlebrook-Dubos and the Rose agglutination test are based on the agglutination of sensitized sheep's cells by human serum, and may be interrelated.

Sputa or laryngeal swabs were cultured for tubercle bacilli in all cases, but there was only one positive (No. 8), and in his case morphologically atypical tubercle bacilli were isolated, which, however, produced tuberculosis on guinea-pig inoculation.

One man of 72 years (Case 1) has died since this investigation was made. His arthritis dated from 1926 and caused him to leave coal-mining in 1928 after having worked 25 years underground, chiefly as a collier. The significant clinical findings are shown in Table II, and x-ray films of his chest and hands are shown in Figs. 4 and 5. A summary of the post-mortem examination conducted by Dr. D. Rivers is given below.

Post-mortem Findings in Case 1

External Appearances.—The body was that of a well-nourished elderly male with numerous coal-pigmented scars present on the hands and forearms and pitting oedema of the lower limbs. Characteristic periarticular swellings and gross deformities of rheumatoid arthritis were present in the elbows, wrists, knees, and ankles. There was subluxation and severe ulnar deviation at all metacarpo-phalangeal joints

of the left hand, with spindling of the proximal interphalangeal joints; the right hand showed much less deformity, but changes typical of severe rheumatoid arthritis. The small toes of both feet had been amputated and there was pronounced lateral deviation of both large toes. No rheumatoid nodules were present.

Internal Appearances.—Pleural adhesions were present in both sides of the chest. Both lungs were enlarged and there was some bullous emphysema at the apices and along the free margins. The cut surface of the right lung showed a group of circumscribed fibrous nodules in the apex of the upper lobe, some of which were joined by narrow bands of black fibrous tissue. These fibrous lesions were 1-2 cm. in diameter, were almost entirely black in colour, but had a whorled appearance formed by thin concentric laminae of yellowish-white fibrous tissue. A number of similar lesions were scattered throughout the rest of the lung, and in addition there were numerous small dust-pigmented fibrous nodules varying from 1 to 2 mm. in diameter. Most of both the larger and the smaller lesions showed central softening and necrosis, but there was no definite caseation or other evidence of tuberculosis. The left lung showed essentially similar appearances, and in the lower part of the upper lobe there was also a large mass of black dust-pigmented fibrosis measuring 5 cm. across its greatest diameter. Central softening and necrosis were present in this mass, but again there was no definite evidence of tuberculosis. Both lungs showed a moderate number of soft-coal-dust foci uniformly distributed throughout their parenchyma, and both were congested and oedematous. The mediastinal lymph nodes were enlarged, black, and firm. There was some cardiac enlargement with right ventricular hypertrophy and atheroma in the main pulmonary arteries and their smaller branches. The liver, spleen, and kidneys were very congested. All other organs appeared normal.

Microscopical Appearances.—The histological features of the predominant type of lung nodule were essentially similar. Each had a large amorphous eosinophilic centre with numerous cholesterol clefts, and in some of them patchy calcification was present. This zone was surrounded by dense collagenous fibrosis, the inner layers of which were hyalinized, and the ghost structure of collagen could be identified towards the periphery of the central zone. In some lesions this central zone consisted of completely hyalinized collagen. A large amount of coal dust was distributed between the fibres of collagen and throughout the centres of the lesions.

Sections of the large mass in the left lung showed it to consist of largely hyalinized dense collagen containing areas of eosinophilic necrosis and cholesterol clefts and heavily impregnated with coal dust. No definite histological evidence of tuberculosis was identified in sections of the nodules or the mass, and no acid-fast bacilli could be found in Ziehl-Neelsen preparations.

Comment.—The cause of death was considered to be congestive cardiac failure due to coal-workers' pneumoconiosis. Though the macroscopical and microscopical appearances of the individual lung lesions are often seen in cases of P.M.F., and the rounded nodules are similar to those described by Gough (1947) as infective nodules, it is unusual to find them so large, so sharply circumscribed, or so numerous and widely distributed as in this case. The pathological evidence supports the contention that the lesions are unlikely to differ in aetiology from that of P.M.F., but material from a case in the active phase is essential to establish this more firmly. It is probable that the lesions described here were active about the time of onset of this man's arthritis 27 years ago, and the appearances are now those of a completely healed infection.

Discussion

This investigation has confirmed the observation that a particular type of radiological appearance in the chest x-ray films of coal-miners is closely associated with the presence of rheumatoid arthritis.

P.M.F. in coal-workers is generally regarded as tuberculosis modified by the presence of coal dust (Gough, 1947; Fletcher, 1948). How do these typical "rheumatoid" lung lesions differ from ordinary P.M.F.? The pathology of this syndrome has been studied at necropsy in only one radiologically characteristic case, but necropsies have recently been performed on seven cases of rheumatoid arthritis in coal-workers with chest films similar to, but less typical than, those described in this series, and evidence of active tuberculosis was found in five of them. The only two men with "rheumatoid" lung lesions who have had a positive sputum culture in life were noted to have morphologically atypical bacilli which, however, produced tuberculosis in guinea-pigs on inoculation.

In spite of the two types of lung lesions tending to merge into one another, we can say in general of the "rheumatoid" lesions that from the radiological point of view there is comparatively little simple pneumoconiosis relative to the time of appearance of the lesions; from the industrial point of view exposure to stone-dust inhalation seems important; from the bacteriological point of view the tubercle bacilli may be abnormal; and from the pathological point of view the lesions are individually similar to the infective nodules commonly found in the neighbourhood of the fibrotic masses of P.M.F. but are larger, more numerous, more discrete, and more widespread than are usually seen in complicated pneumoconiosis.

We have reported here only the results of an investigation in one mining valley, but a number of other cases of this syndrome have been studied. One most interesting finding concerns the time relationship between the development of rheumatoid arthritis and the development of the characteristic "rheumatoid" chest x-ray appearances. It seems likely that in most cases the onset of arthritic symptoms coincides with the development of the lung lesions. In some cases, however, the characteristic x-ray appearances may precede the arthritis by several years, and one case has been found of a miner who developed rheumatoid arthritis six years before his first chest x-ray film was taken; this showed simple pneumoconiosis. The next film, taken five years later, showed the typical "rheumatoid" appearances.

It has been shown that there is probably an increased prevalence of rheumatoid arthritis among cases of P.M.F. On the evidence available it is not possible to state whether the P.M.F. predisposes to rheumatoid arthritis, or whether rheumatoid arthritis predisposes to P.M.F., or whether the factors predisposing to rheumatoid arthritis also predispose to P.M.F. This problem can only be investigated epidemiologically by determining the attack rates of rheumatoid arthritis in men with and without massive fibrosis. It is nevertheless of interest to seek an explanation of the association of rheumatoid arthritis with these characteristic "rheumatoid" lung lesions, and there are at least three possible explanations of this association.

The simplest hypothesis is that the changes in the lung are merely one manifestation of the rheumatoid syndrome and are unrelated to typical P.M.F. Kellgren (1952) has suggested that the inflammatory lesion in the connective tissues in rheumatoid arthritis may be due to collagen breakdown, and it is possible that such changes in the lungs would be made more radio-opaque by the migration of dust-laden phagocytes to these areas of inflammation. This hypothesis is possible, but it is improbable for the following reasons: (a) Such lesions, even if less obvious, would have been seen at necropsy in non-miners. (b) There is some clinical and post-mortem evidence that the lesions are tuberculous. (c) Similar radiological findings have never been reported in association with rheumatoid arthritis. No similar cases were found among non-miners in the Rhondda Fach scheme, where almost 90% of the adult population of 20,000 people were x-rayed (Cochrane *et al.*, 1952).

Discarding the first hypothesis, then, the second explanation of the association is that the pathological changes reflected in the x-ray film may play the part of a chronic septic focus, one of the many other postulated factors in the

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W. E. MIALL AND OTHERS: RHEUMATOID ARTHRITIS ASSOCIATED WITH CHARACTERISTIC CHEST X-RAY APPEARANCES IN COAL-WORKERS



FIG. 1

FIG. 1.—The gradual development of a typical massive fibrosis opacity in the right mid-zone.

FIG. 2.—A typical example of advanced massive fibrosis.

FIG. 3.—A typical example of "rheumatoid" appearances.

FIG. 4.—Coal-miner aged 72 (Case 1) with rheumatoid arthritis of 26 years' duration.

FIG. 5.—Same case as Fig. 4, showing advanced changes of rheumatoid arthritis in both hands.



FIG. 2



FIG. 3



FIG. 4



FIG. 5

MICHAEL HARTY: BLOOD SUPPLY OF THE FEMORAL HEAD



FIG. 1.—Infant femur (×3). Inferior aspect head and neck, showing anastomosis between anterior and inferior retinacular vessels.



FIG. 2.—Posterior view of femoral neck. Arteries injected, and black paper under pedunculated retinaculum.



FIG. 3.—Postero-inferior view of femoral head and neck from below.

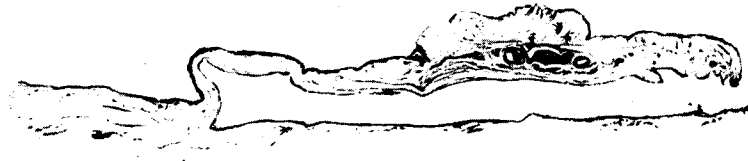


FIG. 4.—Section of retinaculum and periosteum of neck, with blood vessels in pedicle. (×3.)

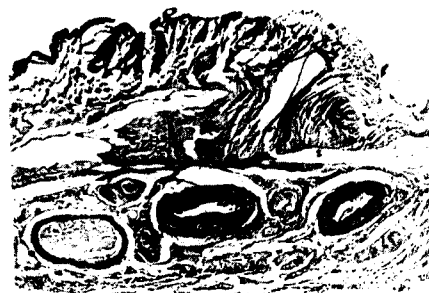


FIG. 5.—Vascular region, showing two thick-walled arteries and one vein. (×18.)



FIG. 6.—Injected retinacular artery to epiphyseal centre and recurrent branches to juxta-epiphyseal region. (×2.)



FIG. 7.—Indian ink injection showing increased concentration of blood vessels at the juxta-epiphyseal "line." (×4½.)

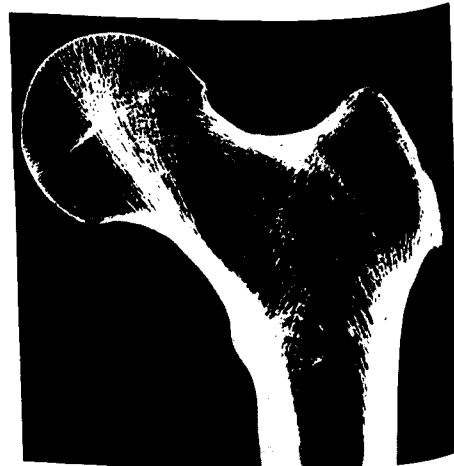


FIG. 8.—Skiagram of femoral segment, illustrating the superior and inferior triangles at the junction of head and neck.

aetiology of rheumatoid arthritis. Against this hypothesis we have the fact that in one case the arthritis preceded the development of typical "rheumatoid" lung lesions by more than six years, and in other cases there may be a latent period of as much as 11 years between the development of the typical lung lesions and the onset of arthritis.

It is possible, therefore, that neither of these hypotheses is correct and that there is some other factor which is causally related to both the arthritis and this type of "rheumatoid" lung lesion—for example, a more fundamental generalized abnormality of tissue reaction to dust and infection.

As these "rheumatoid" lung lesions in miners can develop several years before, concurrently with, or several years after the onset of arthritis, the suggestion is that there may be a particular type of tissue reaction to dust and tuberculosis in the lungs of miners who are predisposed to the development of rheumatoid arthritis. Recent work on adrenal cortical hormones and their relationship to rheumatoid arthritis and to tissue reaction suggests that this may be part of the explanation.

A.C.T.H. and cortisone are known to diminish the inflammatory response to trauma and chemical irritants (Shapiro *et al.*, 1951), to diminish the tuberculin reaction (Long and Miles, 1950; Long *et al.*, 1951; Pickering, 1952), and to inhibit the migration of dust cells in animals receiving intratracheal injection of powdered quartz (Harrison *et al.*, 1952). The formation of silicotic granulomata after intraperitoneal injection of powdered quartz is inhibited or diminished by cortisone in some experimental animals (Magarey and Gough, 1952; Schiller, 1953). These are the effects of excess A.C.T.H. and cortisone. Methods of assaying the levels of circulating A.C.T.H. and cortisone are not yet sufficiently developed to indicate whether these hormones are diminished in cases of rheumatoid arthritis; but Venning, Johnson, and Rose (1951) demonstrated a lowered excretion of certain groups of adrenal steroids in cases of rheumatoid arthritis, and Pearce (1950) found pituitary changes in patients dying with active rheumatoid arthritis, which he considered secondary to adrenal dysfunction. It is possible that rheumatoid arthritis may be related to adrenal or pituitary function, but, as Pickering (1952) points out, there is apparently no increased prevalence of this condition in cases of Addison's disease and Simmonds's disease, and it is therefore unlikely that it is simply due to a pituitary or adrenal defect; but such a defect may contribute to its aetiology, and, similarly, may contribute to the type of tissue reaction causing these "rheumatoid" lung lesions.

Summary

An epidemiological investigation of a syndrome in which rheumatoid arthritis is associated with characteristic chest x-ray appearances in coal-workers is described.

The widespread nodular fibrosis shown in these x-ray films is radiologically distinguishable from typical progressive massive fibrosis, but the available evidence suggests that the aetiology of both types of lesion is similar.

The prevalence of rheumatoid arthritis among cases with these characteristic chest x-ray films is over 50%; among cases of P.M.F. it was found to be 3%; whereas no cases were found in two similar groups of miners with and without simple pneumoconiosis.

The significant epidemiological, clinical, and pathological findings are given, and some possible explanations of the relationship between the "rheumatoid" lung lesions and the arthritis are discussed.

We wish to acknowledge our indebtedness to our colleagues in the Pneumoconiosis Research Unit for much helpful criticism and advice, and particularly to Dr. J. C. Gilson, the director; to Dr. C. M. Fletcher and R. F. Mahler, until recently members of the Unit; and to Dr. D. Rivers, who supplied the report on the pathology of this syndrome. The x-ray films of the peripheral

joints were kindly read for us by Dr. J. H. Kellgren and Dr. J. Sharp, of the Manchester Rheumatism Research Centre; the differential agglutination tests were performed by Dr. J. Ball, of the same unit; and the Middlebrook-Dubos tests were carried out by Dr. Geraint James and Dr. F. O'Grady at the Middlesex Hospital. It is a pleasure to record our thanks to them, and to the miners who so willingly co-operated in this survey.

APPENDIX

(a) *Intra-observer Error in Reading Characteristic Chest X-ray Appearances.*—All 896 films were read twice by the same observer. On the first occasion 20 films were selected as showing these typical appearances and divided into four groups—A, B, C, and D—group A being the most typical, group D the least typical. On the second occasion 27 films were selected, and divided in three groups only—A+B, C, and D. On the second reading, 16 of the 20 original films were reselected; only one of the four cases not reselected on this occasion was a proved case of rheumatoid arthritis, but 11 new cases not previously selected were added in this group; clinically none of these was a case of rheumatoid arthritis, but none was fully investigated in hospital. Of the 16 selected on each occasion, 13 were allotted to the same subgroups as previously. These results are shown in Table III.

TABLE III.—*Intra-observer Error in Reading "Rheumatoid" Chest X-ray Films in Miners*

First Reading	"Rheumatoid" Chest X-ray Appearances	Second Reading			
		A and B	C	D	Total
A and B	6	6	1	—	6
C	1	1	1	—	2
D	—	—	—	2	2
Not selected on first reading	—	—	4†	7†	11
Total	7	7	6	9	22

Cases selected on first reading were all fully investigated.
* One of these cases had proved rheumatoid arthritis, the other three not.
† These 11 cases selected on second reading but not selected on first reading all had no clinical evidence of rheumatoid arthritis, but were not fully investigated in hospital.

(b) *Intra-observer Error in Clinical Diagnosis of Rheumatoid Arthritis under Field-survey Conditions.*—Two observers visited cases at an interval of about three months. In this study 20 men with characteristic x-ray films but thought by Observer A to be possible cases of rheumatoid arthritis were visited by both doctors. Table IV shows the result of this investigation. It will be seen that both observers agreed on the clinical grading of 20 of the 25 men, but both thought two were cases of

TABLE IV.—*Inter-observer Error in the Clinical Diagnosis of Rheumatoid Arthritis in the Field*

Observer A	Clinical Grade	Observer B			
		Certain	Probable	Possible	Total
Certain	7 (7)	7 (7)	—	—	7 (7)
Probable	1 (1)	—	3 (1)	—	4 (2)
Possible	—	—	—	1 (1)	1 (1)
Negative	—	—	—	—	—
Total	8 (8)	7 (7)	3 (1)	1 (1)	11 (9)

The numbers in parentheses indicate proved cases of rheumatoid arthritis.
Certain = Typical history + marked residual signs.
Probable = Typical history + minimal residual signs.
Possible = Typical history + no residual signs.

rheumatoid arthritis when this diagnosis was not substantiated, and both thought one case normal when in fact he was suffering from rheumatoid arthritis. Observer A saw 16 cases he thought positive, of which 12 were later proved cases, and 9 he thought negative, of which 1 was later a proved case. Observer B saw 12 cases he thought positive, of which 10 proved to be so, and 13 cases he thought negative, of which 3 were later proved cases. Such disagreement as occurred

is partly explicable by the desire to find very early cases of a disease in which the earliest symptoms and signs are not usually clearly defined.

(c) *Inter-observer Error in Reading Characteristic X-ray Changes of Rheumatoid Arthritis in the Hands and Feet.*—Two observers from the Manchester Rheumatism Research Centre kindly read the films of the hands and feet of the 20 cases with typical "rheumatoid" chest x-ray films. Their readings are plotted against each other in Table V. In read-

TABLE V.—*Inter-observer Error in X-ray Diagnosis of Rheumatoid Arthritis*

		Second Observer				
		Normal or Doubtful	Slight	Moderate	Marked	Total
First Observer		<i>Hands</i>				
	Normal or doubtful	8 (1)	4 (3)	—	—	12
	Slight	1 (1)	3 (3)	1 (1)	—	5
	Moderate	—	—	1 (1)	—	1
	Marked	—	—	—	1 (1)	1
	Total	9	7	2	1	19
First Observer		<i>Feet</i>				
	Normal or doubtful	12 (4)	1 (1)	—	—	13
	Slight	—	—	5 (5)	—	5
	Moderate	—	—	—	1 (1)	1
	Marked	—	—	—	—	—
	Total	12	1	5	1	19

The numbers in parentheses indicate proved cases of rheumatoid arthritis.

ing the films of the hands there was agreement in 13 of the 19 cases, but in 5 cases one observer noted changes (3 of which were osteoporotic changes only) which were not noted by the other observer; in the remaining case the difference was only one of degree. In reading the films of the feet, however, there was agreement in 18 of the 19 cases. Table V also indicates that the x-ray changes in the feet seemed less likely to be present than in the hands, but when present they were more severe. In this series, four cases of proved rheumatoid arthritis had no changes in the x-ray films of the feet, whereas only one case had no changes in the x-ray films of the hands; nevertheless, among these 11 cases of rheumatoid arthritis six had moderate or marked changes in the feet, whereas only two had moderate or marked changes in the hands. Typical x-ray changes of rheumatoid arthritis were never read by either observer in this series for any case which had no other clinical evidence of arthritis; there was one case of proved arthritis which both observers agreed had no x-ray changes in the hands or feet. This study would have been improved if a normal control bone had been used when each film was taken. Many films were read as "doubtful" because osteoporosis cannot be accurately assessed without such a control.

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BLOOD SUPPLY OF THE FEMORAL HEAD

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[WITH SPECIAL PLATE]

Towards the close of the eighteenth century William Hunter had raised London to the position of one of the best anatomy schools in Europe. He visited Albinus, the celebrated Dutch anatomist, in 1748, and admired his injected anatomical specimens. On returning to London, Hunter developed and elaborated this technique, and many of his original examples are preserved in the Hunterian Museum at the University of Glasgow. This collection contains a number of illustrations of the circulus articuli vasculosus, which Hunter had described originally in 1743.

Materials and Methods

The injected specimens used in this investigation were removed from recent post-mortem bodies or from the anatomical dissecting-rooms. They were dehydrated and cleared in oil of wintergreen (methyl salicylate). Red lead and starch were employed for the intra-arterial injections in Figs. 1 and 2 and indian ink was used for Figs. 6 and 7.

Circulus Articuli Vasculosus.—Since Hunter's original description, this vascular articular anastomosis has been given various anatomical situations. In his account Hunter states, "All round the neck of the bone there is a great number of Arteries and Veins, which ramify into smaller Branches and communicate with one another by frequent Anastomoses like those of the mesentery." These vessels he placed by the margins of the articular cartilages in the subsynovial tissues (Figs. 1 and 2). Some more recent accounts put the circulus articuli vasculosus at the attachment of the joint capsule to the bone. This attachment may coincide approximately with the margin of the articular cartilage in those diarthrodial joints which permit little movements, such as the joints between the intervertebral articular facets. In the adult femoral neck, however, the regions are separated by from 2 to 5 cm. The head of the femur derives its main blood supply from the subcapital anastomosis, as the contribution via the ligamentum teres is, at any age, limited to a small medial segment of the head of the femur. Davies (1946), when discussing the dynamics of haemarthrosis, emphasized the richness and superficial position of the capillary fringe in the synovial membrane.

Retinacula.—The arterial circle at the base of the femoral head is supplied by arteries situated on the neck of the femur between the synovial membrane and periosteum. The vessels are concentrated postero-inferiorly, superiorly, and occasionally anteriorly. The synovial membrane covering these vascular bundles is thrown into longitudinal ridges, to which the term "retinacula" was first applied by Weitbrecht, of St. Petersburg, in 1742. The postero-inferior retinaculum is a very definite structure in the human femur, and shows as a duplication of synovial membrane measuring 1 cm. or more in 76% of specimens examined (Figs. 2, 3, and 4). This pleat of synovial membrane always contains medium-sized arteries, situated at the attachment to the periosteum of the neck or anywhere along the pedunculated area (Figs. 2, 4, and 5).

The Pericapsular Anastomosis.—The afferent arteries to the retinacular vessels are derived from another anastomosis on the capsular attachment towards the base of the neck. This pericapsular corona, which is part of the trochanteric anastomosis, gets its blood supply from the ascending branches of the medial femoral circumflex, the superior gluteal, the obturator, and profunda femoris arteries, as well as from small communications from the acetabular margin

BIBLIOGRAPHY

vessels. Arteries leaving this pericapsular anastomosis enter numerous bony foramina at the base of the femoral neck and pierce small openings in the attachment of the joint capsule. All these arteries are accompanied by a rich plexus of veins, which play an important part in the intravascular thrombosis associated with avascular necrosis of the femoral head.

Ontogeny

During the growth period the circulus articuli vasculosus is situated on the periphery of the epiphysal plate of cartilage and sends branches deeply to the bony epiphysis as well as recurrent vessels to the actively growing metaphysal region (Fig. 6). The marked vascularity of this juxta-epiphysal area, compared with the adjacent diaphysal bone, is obvious in injected specimens (Fig. 7). Harris (1933) pointed out that these metaphysal vessels terminate in large tortuous loops as end-arteries—in contrast to the epiphysal vessels, which anastomose freely. The retinacula in the growing child are well developed, but they are shorter and more firmly attached to the periosteum of the neck than in the adult hip-joint.

Freshly injected specimens demonstrate that the greatest concentration of intra-osseous blood vessels is in the region of Babcock's triangle. This triangle appears in antero-posterior skiagrams as an area sparse in trabecular bone situated inferiorly to the femoral head. An equally obvious triangle, often obscured by the acetabular rim, is seen superiorly at the junction of head and neck (Fig. 8). In fact, the whole base of the head is surrounded by this triangular tunnel, which is utilized by blood vessels to supply and drain the head of the femur. The afferent arteries to this vascular circle can be seen entering the subcapital bony foramina (Fig. 2).

Conclusions

The head and neck of the femur derive their significant blood supply from the pericapsular anastomosis at the base of the neck. The vessels which pierce the capsular attachment are subject to severe trauma and compression in dislocations of the hip-joint and in basal fractures of the femoral neck. These factors, together with pressure from local haemorrhage, jeopardize the vascular channels of the head of the bone.

Basal fractures of the neck of the femur in childhood are frequently complicated by avascular necrosis of the head. The more firm attachment of the synovial membrane to the periosteum of the neck is suggested as an aetiological component for this complication. While the epiphysal plate of cartilage is present the head of the femur depends on the retinacular vessels for its nutrition, as the consensus of reliable opinion is that the vessels in the ligamentum teres are immaterial for the vitality of the head.

Babcock's triangle is a common site for the early manifestations of bony tuberculosis of the hip-joint in children. This very vascular growing region, which is subject to repeated minor traumata and has a slow rate of blood flow, offers a well-protected culture bed for any circulating tubercle bacilli.

In transvesical adduction fractures of the femoral neck the superior and anterior retinacular vessels are always torn, whereas the vessels in the pedunculated postero-inferior retinaculum often escape actual rupture in their continuity but are badly distorted. This alteration of alignment and lumen, which slows or obstructs the local circulation and may lead to eventual thrombosis and avascular necrosis, is a strong argument in favour of early and gentle reduction of this fracture as advocated by recent writers.

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HYPOTHERMIA WITH AUTONOMIC BLOCK IN MAN

BY

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The reduction of oxygen consumption that accompanies a fall in body temperature and the possibilities that induced hypothermia opens up in the field of cardiac surgery and for the poor-risk patient have been the topics of numerous recent publications (Bigelow, Callaghan, and Hopps, 1950; Bigelow, Lindsay, Harrison, Gordon, and Greenwood, 1950; Churchill-Davidson *et al.*, 1953; Annotation, *Brit. J. Anaesth.*, 1953; *Lancet*, 1953). So obvious are the advantages of a state of affairs wherein the cellular oxygen requirements are markedly reduced that they need not be further discussed.

In the past local hypothermia had been produced for a variety of purposes—for example, the relief of pain (Bell, 1812) and the treatment of carcinoma (Arnott, 1851)—but it was not until 1936 that Smith and Fay first induced generalized hypothermia as a treatment for neoplasms (Smith and Fay, 1939). These workers appreciated the necessity of abolishing the body's normal reactions to cold—namely, shivering and vasoconstriction—to facilitate the cooling, and for this purpose they used deep narcosis. The increase in oxygen consumption produced by shivering had already been noted by Voit in 1878, and it was not until 1916, when Krogh eliminated this reaction by curarization, that a fall in oxygen consumption could be demonstrated at lowered body temperatures (Martin, 1930).

In 1948 McQuiston pointed out the possibility of applying the principle to cardiac surgery in hypoxaemic children, and published details of 25 cases (McQuiston, 1949).

The term "artificial hibernation" was originally used by Simpson (Simpson and Herring, 1905) and later by Smith and Fay (1939) to describe the state of induced generalized hypothermia. The recent reintroduction of the term is due in the main to the French workers Laborit and Huguenard (1951). They first studied the potentiation of anaesthesia by promethazine ("phenegan") and diethazine ("diparcol") (Laborit, 1950), and postulated that these drugs produced a partial block of the autonomic nervous system, thus diminishing the body's unfavourable reactions

to surgical trauma (Goldblat, 1951). These workers believe that in certain circumstances death may result from overaction of the autonomic nervous system in an attempt to maintain constant the body's internal environment (Laborit and Huguenard, 1951). Following this reasoning, they attempt to produce a block as complete as possible of the neurovegetative system at all levels, and it is this state which they refer to as "artificial hibernation." To achieve this result the "lytic cocktail" was devised, consisting of the above-mentioned drugs, together with pethidine and chlorpromazine ("largactil"). This latter is known to be a profound depressor of autonomic activity (Courvoisier *et al.*, 1953). A mild degree of hypothermia (34–35° C.) is used to reinforce the autonomic block (Huguenard, 1953).

The technique which we describe is a combination of induced hypothermia and "artificial hibernation," wherein the lowered body temperature is obtained by surface cooling, the lytic cocktail being employed to eliminate the body's normal responses to cold. Our object differs from that of the French workers in that we are primarily concerned with obtaining a reduction in body metabolism, the autonomic block being used only to facilitate the production of hypothermia.

The studies of Kayser and Hiebel (1952) have shown how inaccurate is the term artificial hibernation as applied to man. For this reason we prefer to call the technique "induced hypothermia with autonomic block." This paper is a report of 26 cases in which this technique has been used for major surgery.

Techniques

Production of Autonomic Block and Cooling

With a few minor exceptions the technique followed was the same in all cases. Premedication consisting of pethidine, 100 mg., and promethazine was given intramuscularly three to four hours pre-operatively. An intravenous infusion of normal saline or 5% dextrose was set up about one hour later as a vehicle for administration of the lytic cocktail. The constituents of this were the same for all cases—namely, chlorpromazine 50 mg. (2 ml.), pethidine 100 mg. (2 ml.), and promethazine 50 mg. (2 ml.). Because of the irritant effect of chlorpromazine the injection was made into the drip tubing as far away from the needle as possible. The initial injection was generally 2 ml., followed by supplements of 0.5 to 1 ml. at intervals of 15 to 20 minutes. Modifications in this dosage are discussed later.

Those patients who were not asleep before the beginning of the infusion became unconscious after the first or second dose of the cocktail. With one exception this had occurred within 30 minutes of administration of the first dose. The rapidity of onset of unconsciousness and its depth were a guide to the time to begin surface cooling. On an average this was one and a half hours before operation (range one to three hours). Ice-bags were first placed on the groin, and, in the absence of a response to this, the body was completely covered with ice. Shivering was looked for closely, and its occurrence taken as an indication for a further dose of the cocktail. In all cases cooling was continued until the patient was taken to the theatre. The amount of ice used in the early cases was much less than in later ones; this was partly due to attempts to follow the French methods and partly to caution with a new technique.

During the period of preparation, observations were made of B.P., pulse, and respiration every 15 minutes. Rectal temperatures were taken with a thermocouple which had been previously checked against a mercury clinical thermometer. These were recorded together with frequent observations on the condition of the patient, as assessed by colour, degree of consciousness, presence or absence of shivering, and the drugs administered.

Anaesthesia

The principles of this did not vary from those we would have used for similar cases under normal circumstances. Abdominal and thoracic cases received a sleep dose of barbiturate (if necessary), a relaxant, and nitrous oxide and oxygen (usually 2 litres of each), respiration being controlled or aided throughout. Endotracheal intubation by the oral route was carried out in every case. Induction in non-abdominal cases was with thiopentone and suxamethonium, intubation following topical application of 2% amethocaine or lignocaine to the larynx. Maintenance was with nitrous oxide and oxygen, with or without trichlorethylene or pethidine. There was an enormous variation in dosage from that which would be expected in normal cases, and this is discussed later. Replacement of blood loss was carried out as for normal cases. During the operation observations were made as for the period of cooling.

Rewarming

No attempts were made to hasten this process. On return to bed the patients were covered with a single sheet, and the appearance of shivering was an indication for the application of further covering. It was explained to the nursing staff that for the first 12 hours or so after operation they were to consider their patients to be poikilothermic and to treat them as such, removing blankets should a hyperpyrexia occur. In addition to the routine observations of temperature, B.P., etc., details were noted of post-operative analgesics and sedatives as regards both dosage and time of administration. Note was made of when the patients responded to their name, and this was later compared with the time when they themselves thought they awakened.

Special Investigations

Oxygen uptake was determined at various times during the cooling, the operation, or the rewarming in 12 cases, all of which maintained their spontaneous respiration comparatively undepressed. This was determined by using a Benedict-Roth spirometer. Pre-operative readings were carried out before the pethidine and promethazine were given. Observations during operation were limited to those cases in which, because of the depth of unconsciousness produced by the lytic cocktail and hypothermia, it was possible to avoid the use of an inhalational anaesthetic agent. It was felt that the presence of a gas such as nitrous oxide would unduly complicate the interpretation of results. Towards the end of the series routine analysis of the urine was carried out before and for several days after operation.

Observations

Table I gives a list of operations performed and details of patients.

TABLE I.—Details of Patients and Operations

Case No.	Sex	Age	Operation	Duration Hr. Min.
1	M	24	Portocaval anastomosis	4 40
2	M	33	Oesophago-jejunostomy	4 20
3	M	25	Devascularization of stomach and oesophagus	4 25
4	M	61	Total cystectomy	4 30
5	F	30	Pyelolithotomy	1 20
6	F	44	Partial gastrectomy	2 30
7	F	64	Radical mastectomy	2 0
8	M	60	Partial gastrectomy	2 20
9	F	24	Thyroidectomy	1 5
10	F	58	Splenectomy	2 5
11	M	55	Oesophago-jejunostomy	5 20
12	F	59	For intestinal obstruction	4 5
13	F	24	Exploration of femur	1 0
14	M	52	Colectomy	2 45
15	M	57	Devascularization of stomach and oesophagus	2 30
16	M	77	Bladder diverticulectomy	4 5
17	F	48	Mitral valvotomy	1 0
18	F	20	Thyroidectomy	3 35
19	F	60	Oesophago-gastrectomy	3 35
20	M	53	Laparotomy-colostomy	4 10
21	F	47	Oesophago-gastrectomy	6 25
22	M	53	Devascularization of oesophagus and gastrectomy	3 5
23	M	57	Splenectomy	4 0
24	F	73	Total cystectomy	1 30
25	F	60	Exploration of bile ducts	3 0
26	F	47	Total cystectomy	3 30

Respiratory System

Despite the fact that neither atropine nor hyoscine was given as premedication, no increase in secretions was noted during either cooling or operation in any case. The lytic cocktail invariably slowed the respiratory rate, but this was accompanied by a slight increase in tidal volume. At the temperatures which we reached before operation (36° to 27.4° C.) there were no instances of alarming decreases in respiratory rate, 8 to 10 a minute being the average when the patients were taken to the theatre. These changes were reversed during rewarming. Diminished sensitivity of the larynx, as might be expected from the doses of pethidine used, was very marked. Intubation was carried out in six cases at the end of the cooling, without any barbiturate, and in no instance was there a very pronounced reaction from the patient. This laryngeal insensibility was a disadvantage in one case.

Case 20.—The operation was laparotomy for intestinal obstruction. During cooling, moist sounds in the chest were heard and pulmonary oedema was diagnosed. On closer examination silent regurgitation of gastric contents was detected. Tracheal suction was carried out and the passage of an oesophageal tube revealed a full stomach.

Cardiovascular System

Average blood-pressure changes during the cooling and the operation are shown in Table II, and the suggested prin-

TABLE II.—Blood-pressure Changes During Cooling and Operation

During cooling and autonomic block:	26 cases
Fall	
During operation:	5 ..
No change	
Rise	
Fall	
Actual readings:	45/30
Average fall during cooling	110/80
" pre-op. B.P.	80/55
" during operation	30/25
" fall	60/30
" minimal B.P. during operation	50/30
" maximal fall	60/30

cipal factors causing the pressure falls during operation in Table III. Hypotension of varying degrees occurred during establishment of the autonomic block in every case and during most of the operations. Pressure falls following the first 2 ml. of the cocktail varied enormously from patient to patient and were unpredictable. This led us to introduce a test dose of 1 ml. in poor-risk cases, subsequent doses depending on the B.P. response to the first injection. The fall in B.P. which followed administration of the lytic cocktail had a large postural element in each case, and

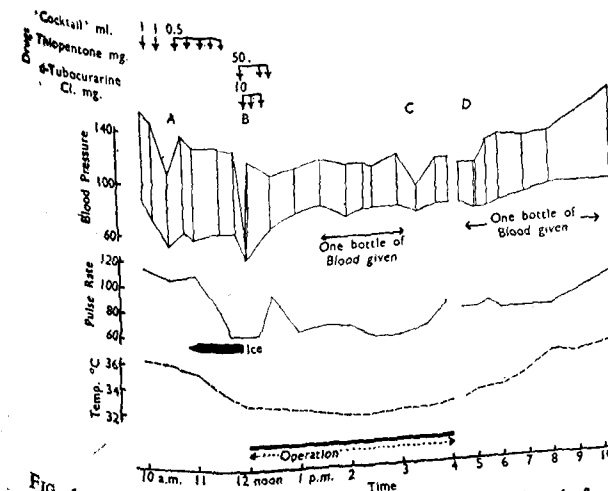


FIG. 1.—B.P., pulse, and temperature changes occurring before, during, and after operation in Case 24. Postural falls in pressure occurred as follows: A=after first dose of cocktail with patient sitting up; B=removal from bed to theatre; C=when head of table was raised. A and B were treated by the head-down position and C recovered spontaneously. D=patient back in bed.

could be reduced, but not abolished, by raising the foot of the bed (Fig. 1). The rise in pressure that was noted in one case during operation was attributed to the Trendelenburg position, which was used during the whole procedure.

From Table II it can be seen that pulse pressure is affected little during the operation, even at the lowest pressures. This might be expected because of vasodilatation due to chlorpromazine. A prominent feature throughout the series

TABLE III.—Suggested Principal Factors Causing Fall of B.P. During Operation

Posture		11	Hypothermia		2
Blood loss		5	Barbiturates		1

was the extreme sensitivity of the B.P. to haemorrhage. Quite significant falls occurred after even slight loss, the pulse remaining almost unchanged. This is due to loss of compensatory mechanisms.

In the absence of shivering the pulse rate fell by 10 to 20 beats a minute during the establishment of the autonomic block and cooling. Shivering invariably raised the rate by 20 to 40 a minute. The changes were very variable during operation, but on the whole there was little variation from that produced by the cooling. The average rate during operation was 80 a minute, values ranging from 55 to 104.

Cardiac irregularities were detected in three cases during cooling. In two instances auricular extrasystoles appeared at the lower temperatures, but disappeared spontaneously during the rewarming. These irregularities were of less importance than the auricular and ventricular fibrillation occurring in the following two cases.

Case 21.—A marked fall in B.P. followed the test dose of cocktail. Cooling was easily achieved, the temperature dropping rapidly to 32° C. At this stage cardiac irregularities were detected. Following thoracotomy the temperature fell to 28° C. and the pulse was grossly irregular, remaining so throughout the operation. A post-operative E.C.G. confirmed the presence of auricular fibrillation. Recovery was slow, and 34 hours post-operatively, when the temperature had reached 32.5° C., normal sinus rhythm reappeared.

Case 17.—A woman aged 48 was admitted for mitral valvotomy. She had a grade 3+ condition of her valve and was frequently in failure. She was orthopnoeic, cyanosed, and had a greatly enlarged right ventricle with signs of basal congestion. She was considered an extremely grave risk by the physicians, but, in view of her complete invalidism and hopeless prognosis, exploration was thought to be justified. After 4 ml. of cocktail the temperature dropped to 32.5° C. Her condition was described as much improved and she had become pink in colour. Her B.P. had dropped from 110/60 to 80/50 and her pulse rate from 80 to 48. When her temperature had reached 31.8° C. ice-bags were applied, and an hour later the temperature was 30.7° C. but her B.P. suddenly became unrecordable. Her pulse rate was 60. Elevation of the foot of the bed restored the B.P. to 85 systolic. Unfortunately, there was a delay in beginning the operation owing to the previous case taking much longer than had been estimated, and her temperature was allowed to fall to 28.4° C. before she was taken to theatre. This was 4 hours 20 minutes after the initial dose of cocktail and three hours after the first application of ice. Her systolic B.P. was 95 and she had had 9 ml. of cocktail. Her pulse was satisfactory, and she was pink. On opening the chest her temperature fell nearly 3°, to 25.7° C., and her heart rate slowed to 50. The surgeon estimated her systolic pressure at 100 and her pulmonary arterial pressure at 60 mm. Hg. The heart seemed to have shrunk to less than its normal size and did not fill the pericardial sac. The ventricular beat seemed weak and rather ineffective. On dilatation of the valve ventricular fibrillation began and was arrested after five and a half minutes by application of an electrical defibrillator (110 V. in 0.1-second impulses). Normal beat was resumed, but fibrillation recurred during suture of the auricular appendage. All efforts to restore this heart failed.

In the majority of cases the B.P. and pulse returned to normal as the temperature rose. In a few patients, however, a secondary fall in B.P. occurred about one to two hours post-operatively. This always responded to posture and small transfusions.

Temperature Changes

On the average a drop of 0.5° C. was obtained during the administration of the cocktail before the application of ice. During the period of cooling before operation a further average drop of 3.4° C. (1 to 10° C.) occurred. Fig. 2 shows temperatures existing during operation in

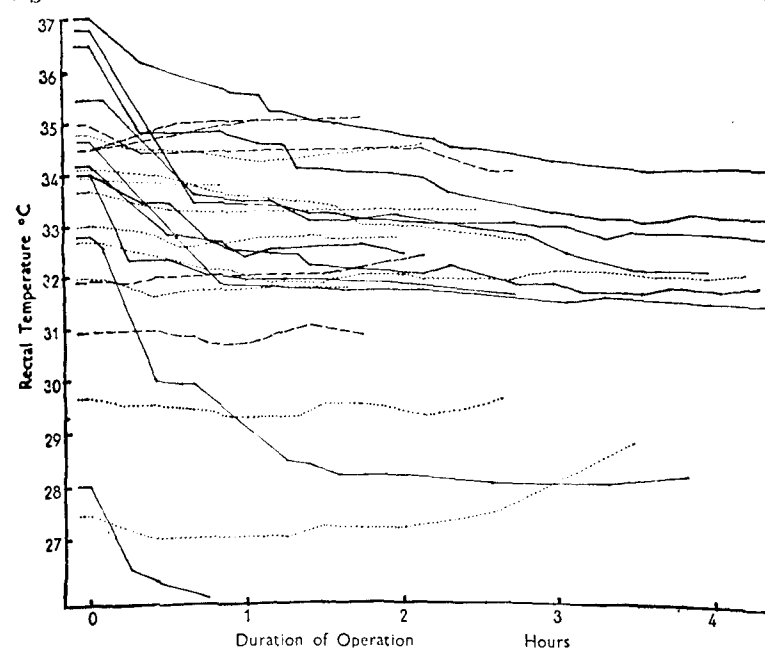


FIG. 2.—Temperatures recorded during operation. Continuous lines=thoracic and abdomino-thoracic cases. Dotted lines=abdominal cases. Broken lines=non-abdominal cases.

24 cases. Perhaps the most significant observation was the fall in temperature of about 2° C. occurring in all cases in which the chest was opened. This did not take place after abdominal section.

The majority of patients had regained their normal temperatures in about 10 hours after operation, though one case already reported (Case 21) remained subnormal for 48 hours.

Bleeding

This varied considerably from case to case, and apparently bore little relation to the existing B.P. In 14 cases there was a marked postural ischaemia; in four cases, despite suitable posturing, bleeding was much increased, while in the remaining eight the amount of bleeding appeared normal. One case of reactionary haemorrhage occurred. This took place 16 hours post-operatively and was of moderate severity.

Excessive bleeding in the absence of any rise in arterial B.P. may be attributable to a rise in venous pressure. This may be a factor at lowered temperatures, when, as has been shown by Bigelow, Lindsay, and Greenwood (1950), venous pressure is likely to rise.

Case 7.—This patient showed excessive bleeding during radical mastectomy; the degree of hypothermia was only moderate (34° C.), but may have been sufficient to exacerbate an already raised venous pressure due to a failing myocardium.

Apart from any consideration of the B.P., bleeding at low temperatures may be due to some interference either with the ability of vessels to retract or with the formation and contraction of blood clot. This may have applied to Case 22.

Case 22.—This man, undergoing splenectomy and transection of the stomach for portal hypertension, bled excessively throughout the operation, which, largely for this reason, lasted six and a half hours. During most of the time his B.P. ranged from 50 to 90 systolic and 40 to 65 diastolic. All efforts to arrest the oozing in the portal bed were unsuccessful, and when

the patient was returned to bed his rectal temperature was 31.5° C. and blood was pouring out of his under-water drain almost as fast as it was transfused. Owing to the large replacement of blood, adequate amounts of calcium gluconate and vitamins C and K were added to the transfusions, but only when the temperature reached 32° C. did the haemorrhage stop. At this time he had received 19 pints (10.8 litres) of blood; the measured loss corresponded. Altogether during and following his operation this man received a total of 21 pints (11.9 litres) to compensate for his loss, and he died 48 hours later, apparently from a transfusion reaction. Necropsy was not performed. At operation the liver was about half the normal size and an advanced degree of cirrhosis was present. The pathologist expressed the opinion that it was remarkable how he had managed to carry on with so little liver tissue. There seemed little doubt that this man's prothrombin level was so low that the clotting of his blood even with slight degrees of hypothermia was seriously affected.

Anaesthesia

The total dosage of all drugs given in thoracic and abdominal cases is shown in Table IV. From this it is immediately apparent that there is a striking reduction in the amount of thiopentone used. If those cases with liver damage are excluded a similar, though less marked, reduction in the amount of D-tubocurarine chloride used is evident. In cases with liver damage comparatively large doses of D-tubocurarine chloride were required (Table V), showing that the observation of Dundee and Gray (1953) in this respect holds true in hypothermic patients. Reversal of the effects of the D-tubocurarine chloride by neostigmine at the end of operation was as in normal cases (Fig. 3). Where suxamethonium was used for intubation its duration of action was normal.

TABLE IV.—Total Dosage of Anaesthetic Agents in 22 Abdominal and Thoracic Cases

Thiopentone	No. of Cases	D-tubocurarine Chloride	No. of Cases
Nil	7	Up to 20 mg.	6
Up to 100 mg.	7	20–30 mg.	5
100–200 mg.	4	30–40 mg.	1
250 mg. +	4	40 mg. +	1
Pethidine	No. of Cases	Others	No. of Cases
Nil	18	Nil	13
Up to 50 mg.	3	Lytic cocktail	2
50 mg. +	1	Chlorpromazine	1

* Excluding five cases with known liver damage. One case received gallamine triethiodide as relaxant.

TABLE V.—Comparison of Amount of D-tubocurarine Chloride Required by Patients with Abnormal Liver Function, and Those in Whom There Was No Reason to Suspect Liver Damage

Liver Function	No. of Cases	Average Duration of Operation (Minutes)	Average Dose of D-tubocurarine Chloride (mg.)
Normal	16	160 (35–320)	26 (5–48)
Abnormal	5	244 (145–385)	58 (50–75)

Post-operative Period

One formed the impression that the general condition of these cases was better than normal after operation. There was a reduction in the amounts of analgesics needed in the first two post-operative days, compared with normal requirements (Table VI). Seven subjects received no sedative or analgesic drug from the end of operation to their discharge from hospital. Although, on the average, patients responded to their names about three and a half hours after opera-

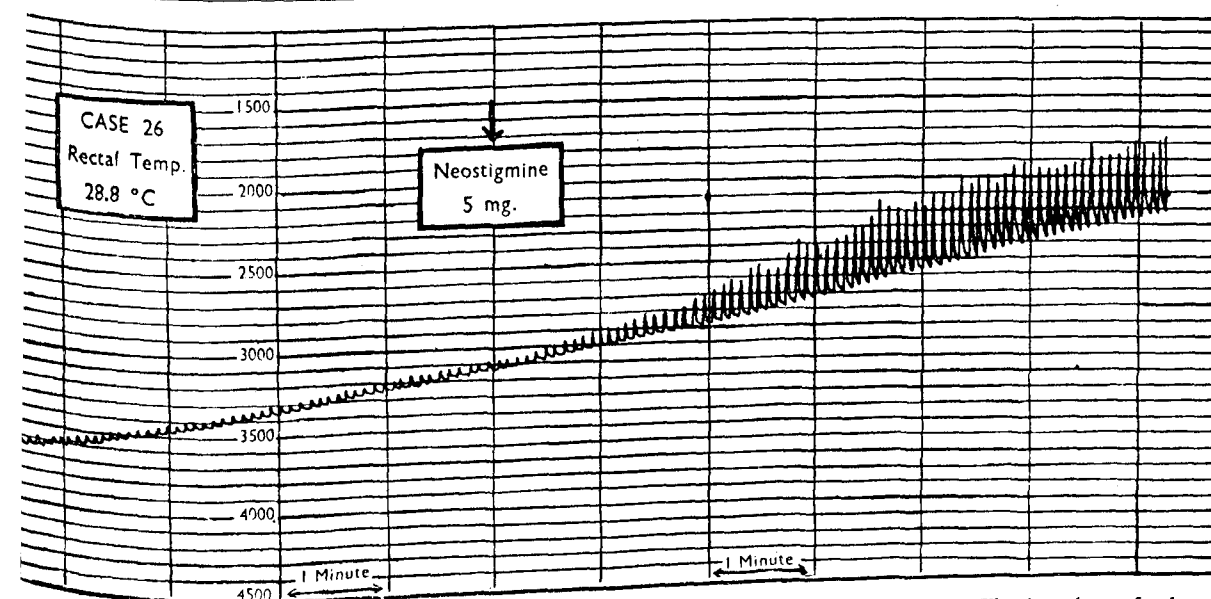


FIG. 3.—Spirometry tracing showing satisfactory reversal of gallamine triethiodide by neostigmine. The last dose of relaxant (40 mg.) had been given 30 minutes before the neostigmine.

tion, yet they themselves think that they did not waken for a further seven hours. This time is significant, as it coincides with the time of administration of the first dose of analgesic.

The complications occurring during this period are listed in Table VII. The three cases with respiratory trouble cleared up with orthodox treatment. The haematemesis which occurred in Case 24 was attributed to trauma during removal of the thermocouple from the oesophagus. It is worth mentioning that this was the only occasion on which rectal temperatures were not recorded, the reason being that excision of the rectum was contemplated in addition

TABLE VI.—Post-operative Analgesics (22 Cases). All Analgesics Recorded as Equivalent Doses of Pethidine (10 mg. Morphine or 8 mg. Methadone Considered Equal to 100 mg. Pethidine)

	First Dose		Total Dosage (mg.)	
	Time from End of Operation	mg.	First 24 Hrs.	Second 24 Hrs.
Hypothermia	10.5 hrs.	60	100	140
Orthodox anaesthesia	3.25 "	130	340	250

B. Analysis of dosage in cases of hypothermia

	No. of Cases	
	First 24 Hours	Second 24 Hours
Pethidine:		
Nil	7	7
Up to 100 mg.	12	6
100–200 mg.	1	4
200–300 mg.	3	1
300–400 mg.	1	1
Promethazine 50 mg.		
Phenobarbitone 200 mg.		

TABLE VII.—Post-operative Complications (Excluding Ketosis, as This was not Looked for in Every Case)

First 48 hours:	No. of Cases
Vomiting	3
Restlessness	2
Lobar collapse	1
Pneumonia	1
Continued haemorrhage	1
Reactionary	1
Prolonged hypotension	1
Sudden B.P. fall	1
Paralytic ileus	1
Haematemesis	1
Hyperpyrexia	1
Later:	
Paralytic ileus	1
Pulmonary embolism	1

to removal of the bladder. Paralytic ileus, which eventually proved fatal in Case 4, was attributable to the surgical procedure, although one cannot dismiss the possibility that autonomic block played some part.

The only hyperpyrexia that was noted occurred in our first case, which is worthy of mention.

Case 1.—The patient was returned from the theatre with a temperature of 34° C. and instructions were given that readings should be taken every 15 minutes. Two hours later a nurse, who was not conversant with the thermocouple, took the oral temperature and found that it was not recordable by a clinical thermometer. She immediately covered the patient with a heat cradle, and by the time the next reading was due the temperature was 39° C. Once the source of heat was removed the temperature gradually returned to normal.

Nursing staff who have been trained to conserve body heat on all occasions find it difficult to get used to patients lying in bed after operation covered only by a sheet. When the lessons from this case were pointed out to them we had no more trouble.

Deaths

Five deaths occurred in this series of cases (Table VIII). We feel that in two cases (Cases 17 and 22) hypothermia may have contributed to the outcome. One cannot dismiss

TABLE VIII.—Cause of Death

Case No.	Time Post-operatively	Cause
4	16 days	Paralytic ileus and peritonitis
16	24 hours	Peritonitis and cardiac failure
17	On table	Ventricular fibrillation followed by asystole
22	48 hours	? Transfusion reaction
24	13 days	Pulmonary embolism

the possibility that the technique played some part in Cases 4 and 24, although this seems unlikely, since the deaths occurred on the 16th and 13th post-operative days respectively. It is difficult to say what parts surgery and hypothermia played in the following case.

Case 16.—This patient suffered from senile dementia with incipient cardiac failure. The instability of this cardiovascular system was shown by a marked B.P. fall following the first dose of cocktail. Hypotension persisted throughout the cooling and for most of the operation, during which the temperature fell to 31.6° C., at which the pulse became irregular. There was a moderate reactionary haemorrhage 16 hours after operation. Rewarming was slow, but the patient's condition gradually improved.

Death occurred suddenly 24 hours post-operatively, when the temperature had reached 34° C. Necropsy revealed peritonitis and appearances suggestive of left ventricular failure.

Difficulties Encountered During Production of Autonomic Block and Hypothermia

In 17 cases there was no shivering or difficulties of any kind. Since this is a new technique the difficulties we encountered in the remaining nine cases are discussed in detail. These are listed in Table IX. Inability to control shivering

TABLE IX.—Difficulties During Cooling

	No. of Cases
Shivering difficult to control	4
Difficulty in producing hypothermia	3
Cardiac irregularities	3
Regurgitation	1
Restlessness	1
Uncontrollable B.P. fall	1

was generally accompanied by a slow fall in temperature. Resistance to the production of autonomic block occurred in the following four cases.

Cases 9 and 18.—Whereas the average dose of cocktail was 7 ml., in the presence of thyrotoxicosis we administered 12 and 13 ml. respectively to these patients, supplemented by intramuscular pethidine and diethazine in No. 18, and with thiopentone in both. Once the initial difficulties were surmounted, satisfactory cooling occurred in both.

Case 13.—This patient was a morphine addict, and even after 10 ml. of the cocktail the autonomic block was incomplete, and the rectal temperature never fell below 35.5° C.

Case 23.—Although this patient weighed only 9 st. 7 lb. (60 kg.) and had a Hb of 41% he proved the most difficult case encountered to date. The administration of 12 ml. of the cocktail over 100 minutes produced no effect on the B.P., and intense shivering was occurring. During the next hour 50 mg. of pethidine and 150 mg. of diethazine were given intramuscularly, the same doses together with 50 mg. of chlorpromazine and 50 mg. of thiopentone being given intravenously. This did not abolish shivering and the temperature fell to only 35° C. Shivering was then controlled by curarization, but in spite of the intensive application of ice the temperature fell by only 1° C. in 50 minutes.

This subject had been receiving nightly doses of butobarbitone (400–600 mg.) and promethazine twice daily for a month. These may have led to a tolerance to the drugs administered, but cannot explain the resistance to cooling when shivering had been completely abolished.

Further difficulties are illustrated in the following cases.

Case 11.—In this instance there was considerable doubt about the activity of the chlorpromazine. Despite the elimination of obvious shivering, presumably accomplished by the pethidine (Dundee *et al.*, 1953), the fall in temperature was negligible. This view is substantiated by the appearance of vasoconstriction following the application of ice.

Case 2.—A peculiar feature here was the almost complete absence of the usual narcotic effects of the cocktail despite a satisfactory response in all other respects. This deficiency was remedied by the use of 25-mg. doses of thiopentone.

Special Investigations

Oxygen Intake.—Fig. 4 includes all the observations that were made on 12 subjects, values being expressed as a reduction from the normal and temperatures as falls from 37° C. As can be seen, it was possible to follow only half the patients throughout the whole procedure, but isolated observations on the remainder were in agreement with these. The overall picture of falls in oxygen intake with hypothermia agrees with the findings of Bigelow, Lindsay, Harrison, Gordon, and Greenwood (1950) and Dundee, Scott, and Mesham (1953) in dogs. A constant observation not shown in Fig. 4 was a drop of 8–10% in oxygen intake that occurred after the cocktail, before the application of ice and drop in body temperature.

Urine Analysis.—This was done in eight cases only. A slight reddish coloration was present for three to four days in three cases. There was no haematuria on spectroscopic examination, and the colour is probably due to the breakdown products of the phenothiazine derivatives, as two of

these cases received promethazine as a sedative in the post-operative period.

The presence of ketone bodies could be detected in three cases after cooling and post-operatively, although clinically and biochemically there was no evidence of acidosis. In one case this persisted until the fifth post-operative day, but

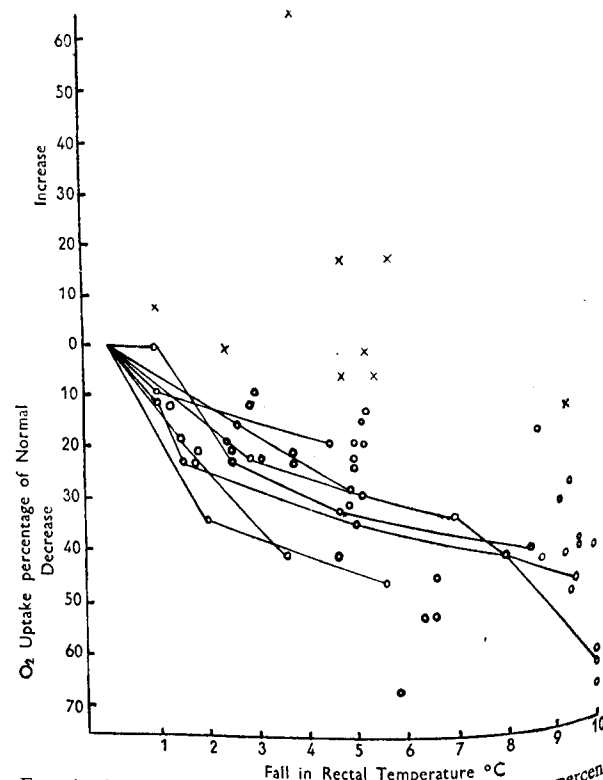


FIG. 4.—Relationship of oxygen intake (expressed as a percentage of normal) to fall in rectal temperature (expressed as a percentage of normal). o—o=observations made in the absence of shivering. Those joined together are serial readings during cooling and operation. O indicates isolated observations at any period of the procedure. X=readings taken when the patient was shivering.

cleared up after 48 hours in the others. Glycosuria was detected in two cases; in both instances the patient had received dextrose intravenously when the temperature was 30–32° C. This cleared up when the temperature was raised. Depression of the glycolytic activity of the liver at low temperatures is a possible explanation of this phenomenon.

Discussion

This paper has been written with the purpose of drawing attention to some dangers of hypothermic techniques. All the patients in this series stood to benefit from the production of hypothermia. Some who were rejected for anaesthesia by orthodox techniques made a highly successful recovery. The high mortality occurred in the group of patients who were seriously ill and who were grave operative risks by any standards. It is considered that in this group the method gave the best chance of survival. Our purpose in observing this series has been to obtain a preliminary assessment of the method of producing hypothermia by external cooling combined with autonomic block. It is useful to know that reduction of temperature can be satisfactorily and easily produced in patients, without the necessity for an extracorporeal arteriovenous shunt (Delorme, 1952), a procedure which it seems to us carries its own risks. It is apparent from our experience that an degree of hypothermia can be obtained by this technique. It is a method, moreover, which avoids an undesirable depth of anaesthesia or prolonged periods of respiratory arrest due to curarization, which would otherwise be necessary to avoid shivering.

Our experience both in this series and in animal experiments has led us to two conclusions. First, that the danger

of serious cardiac irregularity at temperatures lower than 28° C. is real, and is particularly imminent if cardiac manipulation is required. Secondly, the difference in oxygen consumption between a patient at 28° C. and one at 25° C. is insufficient, in the present state of our knowledge, to warrant the extra risks involved by proceeding to lower temperatures.

The reduction in bleeding during hypothermia has not always been as marked as was expected. At low temperatures the prolongation of the clotting time and/or bleeding time has on occasion been a source of embarrassment. We are proceeding to investigate the effect of different prothrombin levels on the clotting time of blood at different temperatures. We feel that, before hypothermia is employed for cases of portal hypertension with liver cirrhosis, the clotting-time of the patient's plasma should be estimated at various temperatures so that the critical level may be ascertained.

It seems to us reasonable also that hypothermia might be an added risk in patients whose myocardium is damaged (see Cases 7, 17, and 21). Initial heart-lung experiments which we have performed in the dog have confirmed the findings of Knowlton and Starling (1912) that the myocardium is affected at lower temperatures, and suggest that the Starling response to stretching the myocardial fibres is less efficient. It is therefore questionable whether any degree of hypothermia—say below 30° C.—is justifiable in cases with a damaged myocardium until further work has been carried out to elucidate this problem.

A weakness in this technique has been the comparative lack of control of the patient's temperature. If the hypothermia becomes too intense, as when allowance has not been made for the 2–3° C. fall which always occurs on opening the chest, there is no adequate means of correcting the situation. This is no fault of the autonomic blockade, but is a technical problem, to which we are giving consideration.

The indications for hypothermia would seem to be:

1. When a degree of hypotension is required to control haemorrhage either for patients in whom large blood loss is expected, or in whom even a small blood loss will embarrass the work of the surgeon. We have never been convinced of the safety of hypotensive techniques in which the supply of blood carrying oxygen to the tissues is reduced without any effort being made to reduce to some extent the oxygen demands.

2. In patients with a severe degree of anaemia which cannot be corrected before operation. This series has included four cases of oesophageal varices in which there was a marked degree of anaemia and which responded to transfusion only by further haematemeses. The combination of anaemia with the hypotension which is so helpful to the surgeon in these cases is justifiable only if the oxygen demands of the patient are reduced by hypothermia. This

is well illustrated by Case 3 (Fig. 5), when a patient whose Hb was only 50% was maintained for 44 hours at a B.P. averaging 60/30 (minimum 35/25). His recovery was complete and uneventful.

3. In operations on the heart and great vessels in which it may be necessary to cut off the cerebral circulation for a period of time. In this regard a startling observation was made in Case 17. For 17 minutes, at 25° C., after all possibility of cerebral circulation had ceased, this patient's respiratory centre continued to function, as evidenced by quite normal respiratory movements.

4. In thyrotoxicosis which cannot be controlled by medical treatment. One case in this series had been presented for operation on two previous occasions and returned to the ward because of an uncontrollable pulse rate of 160 a minute. Induction of hypothermia reduced this to 80 a minute, considerably improved the general condition of the patient, and enabled an operation to be performed, which was followed by an uneventful recovery.

5. Presumably in neurosurgery there will be indications for this technique, but up to the present we have had no experience with this application.

6. In certain therapeutic indications such as hyperpyrexia occurring in pituitary disorders or post-operatively in children, and in thyroid crises.

Summary

The history of the production of hypothermia in man is reviewed, and a method described for its production in man with the help of block of the autonomic nervous system.

The use of this technique in 26 cases undergoing operation is described.

Observations are recorded of the changes that occurred in the respiratory system, the cardiovascular system, and the body temperature, with the amount of bleeding.

Dosages of anaesthetic agents and post-operative analgesics are discussed, as are post-operative complications and deaths that occurred.

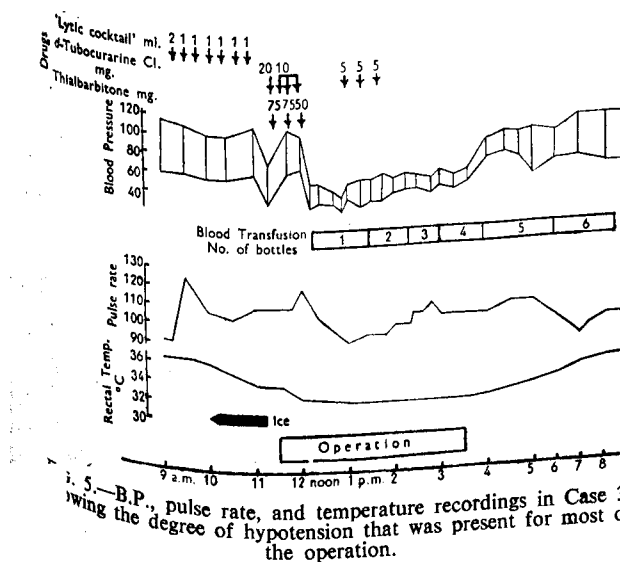
The troubles that we encountered during the production of the autonomic block and cooling have received special mention.

Our findings concerning the relationship of oxygen intake to temperature, and the presence of abnormal constituents in the urine following this technique are reported.

We are indebted, among others, to Professor C. A. Wells and Mr. R. W. Doyle, with whose co-operation this study was made possible. We are also grateful to Dr. J. Harper, of Pharmaceutical Specialities (May & Baker) Ltd., for supplying the chlorpromazine (largactil), promethazine (phenegan), and diethazine (diparcol) for this investigation; and also for his courtesy and assistance.

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THE PRODUCTION OF HYPOTHERMIA

BY

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The effect of hypothermia in diminishing the body's oxygen consumption has led to a recent interest in this as an aid to anaesthesia in the poor-risk case and in major surgery. Man is equipped with a highly effective mechanism for combating the effects of cold, and the first step in the production of hypothermia must be to overcome this response. This can be achieved by deep anaesthesia (Bigelow *et al.*, 1950), the use of muscle relaxants (Krogh, 1916), or by the "lytic cocktail" or "liberation cocktail" introduced by the French workers Laborit and Huguenard (Huguenard, 1953).

We have compared the efficacy of these three methods in facilitating the production of hypothermia in the anaesthetized dog by means strictly comparable to those applied in man, and the individual constituents of the "lytic cocktail" have been studied. Their effect on the rate of fall of the rectal temperature after the application of ice, and on the amount of shivering produced, has been studied. We have also investigated the effect of hypothermia, induced with the aid of the constituents of the "lytic cocktail," on oxygen intake, heart rate, and respiration.

Methods

Unselected mongrel dogs were used, varying in weight (8-16 kg.) and age. Basal narcosis was induced by the intraperitoneal injection of 30 mg./kg. pentobarbitone in a 3% solution at approximately blood heat (Adams, 1944). Once the dogs were asleep endotracheal intubation with a cuffed tube was carried out by the aid of a topical application of 2% amethocaine or 2% lignocaine. Forty-five minutes after induction of anaesthesia adjuvant drugs were administered in doses as follows: pentobarbitone, 15 mg./kg.; D-tubocurarine chloride, 3 mg./kg.; chlorpromazine, 2 mg./kg.; pethidine, 4 mg./kg.; promethazine, 2 mg./kg. The "lytic cocktail" comprised all of the last three in the doses mentioned. With the exception of pentobarbitone (which was given intraperitoneally), all drugs were given by deep intramuscular injection mixed with 1,000 Benger units of hyaluronidase. Immediately the muscle relaxant was given the cuff of the endotracheal tube was inflated and the animals' respiration mechanically controlled with oxygen for periods of three to four hours. A similar procedure was adopted when respiration failed because of hypothermia. Fifteen minutes after injection of the adjuvants the animals were covered with ice-bags. Cooling continued for 90 minutes, when the animals were gradually heated up by the help of hot-water bottles and a hair-drier.

These doses of the constituents of the "lytic cocktail" are similar to those which are given to man. The total amount of pentobarbitone (45 mg./kg.) administered to those animals who received it as an adjuvant will result in deep anaesthesia (Adams, 1944). In the case of D-tubocurarine chloride, 3 mg./kg. was given, as we found that this will invariably produce apnoea over the period of our investigations, and it can be safely reversed some three to four hours later by neostigmine 5 mg. and atropine 2 mg.

In order to reduce the factor of individual susceptibility of the dogs to the drugs and to cooling, the experiment was planned so that during its course each animal received each of the adjuvants. As will be reported later, three dogs died during this study. In the case of two of these the death occurred when the last adjuvant drug was being investigated, so that the series with these is complete. In the third instance the fatality was with the first drug, and no readings obtained from this dog are included in the results.

Rectal temperatures were noted by a thermocouple every five minutes, and the presence or absence of shivering was noted at similar intervals. The heart rate was recorded every 15 minutes. Oxygen intake was measured by means of a direct recording of respiration on a spirometer containing oxygen. To reduce resistance to respiration all valves were removed from the instrument and a small soda-lime canister was inserted close to the endotracheal tube. Care was taken to see that the circuit was leak-proof, and at temperatures below 30° C. respiration was aided during the period of observation. This ensures full oxygenation of the blood and eliminates respiratory depression as a cause of decreased oxygen intake (Bigelow *et al.*, 1950). Another factor which may well interfere with the readings is the excretion of nitrogen by the dog when breathing from a spirometer containing oxygen. To overcome this a large flow of pure oxygen was administered by a T-piece once the endotracheal tube was in position, and between readings the animal was maintained on pure oxygen.

Results

On all occasions the normal temperature of the animal was taken as that immediately before the administration of the adjuvant drug—that is, three-quarters of an hour after the intraperitoneal administration of the basal narcotic. For

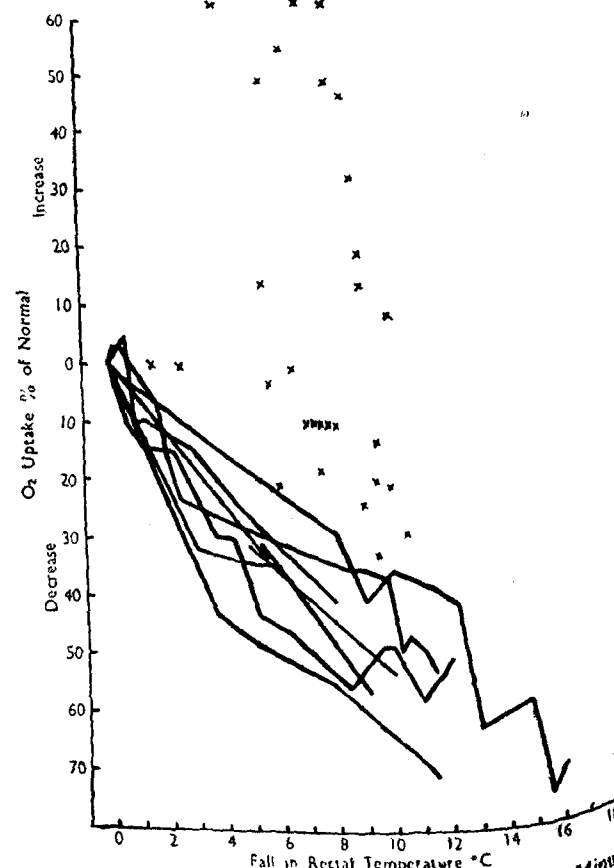


FIG. 1.—Relationship of oxygen intake to temperature. Minus values indicate continuous readings in the absence of shivering. X, Isolated readings taken when the animal was shivering.

the sake of simplicity all temperatures are recorded as variations from this normal. In order to compare the amount of shivering under various conditions a point system was adopted. The presence or absence of palpable shivering was noted at five-minute intervals, one point being recorded for every positive observation. The average of six observations with each of the drugs studied can be seen in Table I. This shows the fall in temperature which took place every 15 minutes and the total amount of shivering every 30 minutes. In each of these dogs preliminary studies of oxygen intake under the effects of 30 mg./kg. pentobarbitone revealed that there were negligible changes over the period from 40 to 180 minutes after the injection of the barbiturate. Thus any changes which we have recorded are due to the hypothermia or adjuvant drug. As in the case of temperature, the normal readings for oxygen intake, pulse rate, and respiratory rate were taken to be those recorded immediately before the administration of the adjuvant. Changes in oxygen intake are expressed as percentages of the normal, whilst alterations in pulse rate are recorded as absolute changes from normal.

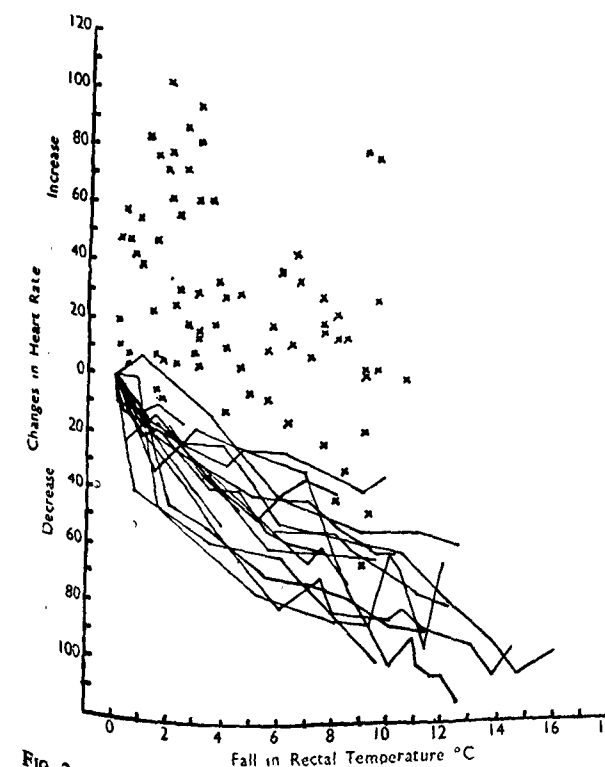


FIG. 2.—Relationship of heart rate to temperature. Minus values recorded when no shivering was occurring. X, Readings taken during bouts of shivering.

TABLE I.—Effects of Various Drugs and Combinations of Drugs on Average Fall in Rectal Temperature in the Dog and Amount of Shivering After Covering with Ice. (See Text for Explanation of Method of Recording Amount of Shivering.)

Drugs	Dose, mg./kg.	Average Fall in Rectal Temperature °C.						Average Amount of Shivering		
		Time in Minutes after Covering with Ice						Time in Minutes After Covering with Ice		
		15	30	45	60	75	90	0-30	35-60	65-90
Pentobarbitone	30	0.8	1.5	2.7	3.7	4.5	5.2	2	4	5.4
Pentobarbitone 30 mg./kg. plus the following, given 45 minutes later:										
Pentobarbitone	15	1.5	3.4	5.1	6.7	7.6	9.1	0	0	0.5
D-tubocurarine chloride	3	1.2	3.2	5.0	6.6	8.1	9.5	0	0.6	0.8
"Lytic cocktail," comprising:										
Chlorpromazine	2									
Pethidine	4	1.7	3.3	5.1	6.9	8.5	10.4	0	0	0.5
Promethazine	2									
Chlorpromazine	2	2.2	3.3	5.6	7.5	9.0	10.6	0	0	0
Pethidine	2	1.0	2.3	3.5	4.9	5.7	6.5	0	2.3	3.2
Promethazine	2	1.1	2.6	4.0	4.7	5.2	6.0	1.2	3.5	5.7

Fig. 1, showing the relationship between oxygen intake and temperature (10 observations), demonstrates a fall in the former as the latter decreases. However, when shivering occurs there is a consistent rise in oxygen demands. The lowered temperature may be seen to have a similar relationship to heart rate and respiratory rate in Figs. 2 (25 observations) and 3 (10 observations) respectively; but here again rises are constantly provoked by the onset of shivering. Apnoea is apt to occur at a rectal temperature of 25° C., but severe respiratory depression has been noted at temperatures of 29° C. and under.

Cardiac arrest occurred in three dogs at temperatures of 23° C., 23.5° C., and 26.5° C., respiration being unaided in all cases. It is significant that lower temperatures (21° C.-22° C.) have been obtained without untoward effects in those animals in which respiration was fully controlled with oxygen.

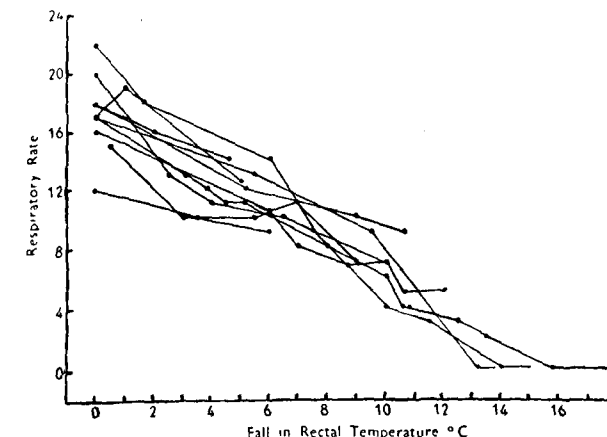


FIG. 3.—Relationship of respiratory rate to temperature.

Discussion

From Table I a comparison of those recognized methods of facilitating the production of hypothermia can now be made. An analysis of the results obtained with deep anaesthesia, curarization, and the "lytic cocktail" is given in Table II. This expresses the average temperature fall obtained using these methods after 90 minutes' cooling as a percentage of that occurring with basal narcosis alone. The amount of shivering which occurred during the last hour of cooling is similarly expressed. It is apparent from Tables I and II that there is little to choose between these three methods as regards rate and amount of temperature fall, and abolition of shivering.

A similar analysis of the effects of the constituent drugs of the "lytic cocktail" is also shown in Table II. From this it may be seen that by far the most active constituent

TABLE II.—The Fall in Rectal Temperature that Occurred After Covering with Ice for 90 Minutes and the Amount of Shivering that Occurred During the Last Hour of the Cooling Expressed as a Percentage of the Observations Made Under Similar Conditions with Basal Narcosis Alone

	Percentage of Similar Readings with Basal Narcosis Alone	
	Fall in Rectal Temperature at 90 min.	Amount of Shivering, 35-90 min.
Recognized methods of facilitating the production of hypothermia:		
(a) Deep narcosis	+75	-95
(b) Curarization	+83	-85
(c) "Lytic cocktail"	+100	-95
Individual constituents of the "lytic cocktail":		
(a) Chlorpromazine	+104	-100
(b) Pethidine	+25	-42
(c) Promethazine	+15	-2

in facilitating the production of hypothermia is chlorpromazine. Pethidine, while moderately effective in eliminating shivering, has comparatively little effect in aiding the fall in temperature. The effects of promethazine appear to be negligible. A graphic representation of the rate of temperature fall obtained with chlorpromazine, pethidine, and promethazine (Fig. 4) demonstrates a steady fall in temperature with chlorpromazine. In the case of pethidine and promethazine the onset of shivering causes a marked

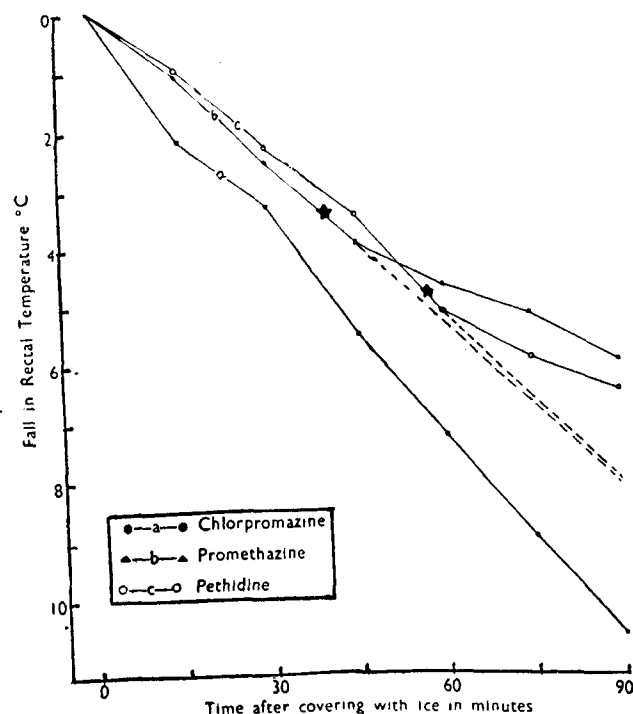


FIG. 4.—Rate of fall of rectal temperature when animal was immersed in ice with (a) chlorpromazine, (b) promethazine, (c) pethidine. * Average time after beginning of cooling to onset of shivering. --- Hypothetic continuation of the steady fall in temperature that occurred with pethidine and promethazine before the onset of shivering.

reduction in the rate of temperature fall. A hypothetical continuation of the steady fall occurring before the onset of shivering shows that neither of these drugs would have been as effective in facilitating the fall in temperature as chlorpromazine. A possible explanation of this may be the occurrence of clinically undetectable shivering. That this can occur has been shown by previous electromyographic studies (Göpfert and Stuffer, 1952).

It is not the purpose of this paper to consider the mode of action of these drugs in facilitating hypothermia, but one point, however, seems worthy of mention. A dog in which hypothermia has been induced with the aid of pethidine will

show a very marked increase in the degree of shivering following the intramuscular administration of n-allyl-normorphine (3 mg./kg.). It is interesting to conjecture whether this is due to a reversal of the analgesic effect of pethidine in regard to thermal sensation (Evans, 1952) or whether it is due to a reversal of its central effects.

The fall in oxygen intake which we have observed during hypothermia closely resembles that reported by Bigelow *et al.* (1950). He induced hypothermia by cooling dogs sufficiently anaesthetized to eliminate shivering, and made no use of the "lytic cocktail." It is difficult to make a comparison with the findings of Churchill-Davidson *et al.* (1953), as these workers do not give sufficient details of their method of measuring oxygen consumption.

This could suggest that, provided shivering be eliminated, a fall in oxygen intake occurs with hypothermia irrespective of how this is produced.

Summary and Conclusions

A study has been made of the production of hypothermia facilitated by (1) deep anaesthesia, (2) curarization, (3) the "lytic cocktail." All three appear to be equally effective.

The active constituent of the "lytic cocktail" appears to be chlorpromazine. Pethidine decreases shivering somewhat while producing but little fall in temperature. Promethazine seems to have little effect.

Observations have been made on the effect of hypothermia on oxygen intake, pulse rate, and respiratory rate. All three are depressed at lowered temperatures, irrespective of how these are obtained.

We are indebted to Pharmaceutical Specialities (May & Baker) Ltd. for liberal supplies of chlorpromazine and promethazine used in this investigation.

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The Scientific Film Association has issued a catalogue of films on psychology intended primarily to help in the selection of films for research workers and senior students, teachers of psychology, and lay audiences. The films, of which there are 107, were made between the years 1930 and 1953, and all are believed to be available in the United Kingdom. About 70 of them have been appraised by methods evolved by the S.F.A. during the last 10 years, and the appraisals are included in the catalogue to help in selecting films. The catalogue is divided into seven sections: (1) Developmental Psychology, (2) Educational Psychology, (3) Testing Techniques, (4) Industrial and Applied Psychology, (5) Animal and Experimental Psychology, (6) Abnormal Psychology and Psychiatry, and (7) Juvenile Delinquency. Information is included on the running times of films, whether they are talkies or silent, and whether in black-and-white or in colour. Some are available free and others must be hired, and some are available only for special types of audience—that is, from which laymen are excluded. The catalogue lists many films made in Canada and the U.S.A. as well as Great Britain, and includes some made in Denmark, the U.S.S.R., Belgium, and Germany. While the Scientific Film Association itself does not distribute the films, the catalogue gives a list of owners and distributors from whom they may be borrowed. It is obtainable from the association at 164, Shaftesbury Avenue, London, W.C.2 price 7s. 6d. (8s. 1d. post free). It may be of particular interest to teachers of psychiatry.

HIBERNATION ANAESTHESIA IN MAJOR SURGERY

A REPORT OF 36 CASES

BY

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In major surgery, particularly in the case of malignant disease, where the patients are often cachectic and very ill, it is often not possible to contemplate surgical intervention. If an operation is started, after an hour or two of traumatic surgery the patient's condition deteriorates, and, however carefully the cardiovascular system is supported by intravenous transfusions, a state of shock develops. The completion of the operation may become an urgent matter, and the extent of the operation may have to be modified. Under effective "hibernation" anaesthesia the patient does not react in any way to the surgical stimulus, however severe or long-continued. Furthermore, intravenous transfusion is confined to replacing only the volume of blood lost. This is surprisingly small when measured, amounting to 300-400 ml. in extensive pelvic clearances. The body temperature drops to between 95 and 96° F. (35 and 35.6° C.), but this is only an indication that the autonomic blockade has succeeded, and it returns to a degree or two above the pre-operation level in six hours. The state of the patient approaches in many ways that found in the mammiferous hibernating animal, but it is not a truly comparable condition.

The defence mechanisms of the body for the preservation of the *milieu intérieur* of Claude Bernard against stress, aggression, or change in the external environment are largely the function of the autonomic nervous system. The hypothalamus, with its connexions with both the cerebrum and the autonomic system, has thus a large part in the control of the internal environment.

Conventional methods of anaesthesia attempt to modify these autonomic defences. This is done by depressing the cerebral functions, and in this way modifying the thalamic and hypothalamic control of the autonomic system; or, working from the periphery, by obtunding the stimuli that call the defence mechanisms into action. In the vasomotor system the defence mechanism, working through the mediation of the autonomic nervous system, causes the shutting of the pre-capillary sphincters and the opening of the arteriovenous shunts (Chambers *et al.*, 1943). This increases the circulating blood volume and also increases the venous oxygen tension, in order to combat the aggression. In the central nervous system, experimental work would indicate that the shunt mechanisms are not present; consequently, following aggression the oxygen supply to the vital centres is not diminished and may even be increased. In the peripheral circulation, if the stress is at all long-continued, these same defence mechanisms result in capillary dilatation, and the increased pressure at the venous end of the capillary loops is followed by fluid loss into the tissues, with diminution of the circulating blood volume. This leads to anoxia, building up of acid metabolites, and, finally, atony of

the peripheral vessels—the fatal peripheral failure which no amount of intravenous or intra-arterial infusion will reverse. In this way the patient dies as a direct result of his attempt to preserve his *milieu intérieur*.

Physical Cooling

For many years attempts have been made to modify the reaction of the body to surgical aggression by means of physical cooling. It has been found by Prec *et al.* (1949), Bigelow *et al.* (1950), and Bigler and McQuiston (1951), and others that when the body temperature has been finally reduced by physical means the oxygen consumption of the tissues is markedly lowered. It is then possible to undertake surgical operations requiring the exclusion of the heart, or lungs, from the circulation for several minutes, without anoxic damage to the tissues.

However, the application of ice-packs, refrigerated blankets, and other external cooling in itself constitutes a stimulus which calls the defence mechanism into action. This is shown by increased oxygen consumption and heart rate, and by shivering in order to maintain body temperature. Only when the defence mechanism is overcome do the body temperature and the oxygen consumption drop (Prec *et al.*, 1949; Jaulmes, 1953). It is at this stage, on the way to final dissolution of the subject, that these operations can be performed.

The artificial hibernation technique evolved by the French workers, Jaulmes, Laborit, Huguenard, and others owes little to physical cooling of the subject from without, but depends on the specific neuroplegic effect of drugs, mainly those of the phenothiazine group on the autonomic nervous system. The phenothiazine derivatives include the antihistamine drugs promethazine hydrochloride ("phenergan") and promethazine-8-chlorotheophyllinate ("avomine"), which has a central action, particularly upon the vomiting centre, and chlorpromazine ("largactil"), which has no antihistaminic action. This drug seems to act centrally on the autonomic system as a neuroplegic, and it has a pronounced anti-adrenaline effect and a direct depressant action on the temperature-regulating mechanism.

Laborit *et al.* (1952) have described a detailed plan for producing a state of artificial hibernation which has guided us in our efforts to ameliorate the condition of patients subjected to major surgical procedures. He relies on the use of a "lytic mixture" consisting of 50 mg. of promethazine, 50 mg. of chlorpromazine, and 100 mg. of pethidine, which is administered intravenously in divided doses in the hour before operation. The hibernant state is maintained by giving, intravenously, one of three "cocktails" containing, among other drugs, aneurine, pethidine, promethazine, chlorpromazine, diethazine hydrochloride, sparteine sulphate, ascorbic acid, ethyl alcohol, and procaine. In addition acetosterandryl, neostigmine, and heparin are given intramuscularly.

Present Investigation

We have attempted, so far as is practicable, to avoid the polypharmacy of our French colleagues. The technique which we now adopt and which has given excellent results in our hands in a variety of major surgical procedures is as follows. The patient is given 50 mg. of promethazine-8-chlorotheophyllinate by mouth two hours pre-operatively. One hour later this is followed by a subcutaneous injection of 100 mg. of pethidine with 1/150 gr. (0.43 mg.) of hyoscine hydrobromide. The patient is brought to the anaesthetic room and the mixture of promethazine, pethidine, and chlorpromazine, in the proportions advocated by Laborit, is given in divided doses in the half-hour preceding operation. During the injection the pulse rate rises at first but later settles to a level a little above the resting rate, and remains unaltered despite the duration or severity of the surgical procedure. The respirations become shallow and may increase in rate, while the systolic blood pressure tends to fall and is maintained in the region of 100 mm. Hg. At the conclusion of the injection the patient is somnolent and apathetic but can still be roused. A small dose of 5% thio-

pentone, 2-3 ml., is given to produce unconsciousness, and tracheal intubations may then be performed with ease.

The patient is transferred to the theatre, where small doses of relaxants are given when required. Oxygen is administered if the respiratory excursion is inadequate, particularly in those cases requiring the steep Trendelenburg position. In prolonged operations, if the pulse rate begins to rise we have been able to re-establish control by a small supplementary dose of the original mixture. Great care is taken to replace any blood lost, as the patient is not able to compensate for gross diminution or increase of circulation blood volume. Our experience so far has been of patients aged from 28 to 76 years, and has included the following operations: gastrectomies, Wertheim's hysterectomies, hysterectomies, total colectomies, anterior pelvic exenterations, adherent malignant ovarian cysts, laminectomies, bilateral mastectomy and a second operation of prostatectomy on the same patient, together with less extensive operations in patients who would normally be considered poor risks.

Case Reports

Case 6.—A married woman aged 76, weighing 8 st. 4 lb. (52.6 kg.), had had two operations for carcinoma of the body of the uterus. She was admitted for symptoms of large-bowel obstruction with a large tumour arising from the pelvis with ascites. B.P. was 180/120. Six hours after admission she developed gross cardiac irregularity and electrocardiography indicated a coronary infarction. She was thought to be unfit for operative intervention. Two days later her condition became grave and fibrillation was occurring at a rate of 140, with a pulse deficit of 10-20 beats at the wrist. She was treated by the technique described above. Operation entailed the removal of a large adherent malignant ovarian mass involving the sigmoid colon, which was resected, and an anastomosis was performed, with a colostomy above. During the operation, which took three hours, she received 400 ml. of blood to replace the estimated loss. Her pulse rate remained irregular throughout at 90-100 a minute. Her rectal temperature was 96° F. (35.6° C.) at the conclusion of the operation. She was rousable within three hours of the end of the operation and regained consciousness after six hours. Her rectal temperature rose to 100.2° F. (37.9° C.) during this period and her pulse rate remained irregular at the same rate. She has made an uneventful recovery.

Case 23.—A man aged 46, weighing 8 st. 6 lb. (53.5 kg.), had generalized Paget's disease with involvement of the spine. He had had spastic paraplegia and loss of sphincter control for eight months. A myelogram showed a spinal block at the level of the fourth dorsal vertebra. We obtained an autonomic blockade by the method described, and an extensive decompression of the spinal cord was undertaken by performing a bilateral laminectomy from the fourth to the eleventh dorsal vertebra. Blood loss was very rapid and was replaced by a transfusion of 4 pints (2.3 litres). His pulse remained steady at 90-100 a minute and his systolic pressure was sustained at just over 100 mm. Hg. Recovery was uneventful and his neurological condition was improving.

Conclusions

It is impossible to assess statistically the advantages of any anaesthetic technique. From the small series of 36 cases involving really major surgery we have been impressed by the excellent condition of the patients, however extensive or long-continued the operation. We have had no deaths due either to the use of the method or to the operations performed. At no time during any of the procedures or during the post-operative period has the condition of the patient caused any anxiety. Furthermore, there has been no post-operative vomiting, nausea, or headache. The patients require less nursing care than normal, heavy post-operative sedation is not required, and there have been none of the post-operative complications which might have been expected to follow such major surgery. The patients are contented with this technique, for, although they can be roused,

most of them have complete amnesia from the time they leave the ward until six to eight hours after the operation. The freedom from post-operative pain and restlessness during this period seems to aid their recovery, for when the autonomic blockade has worn off they are cheerful, rested, and relatively free from pain.

The great advantage of this modification of Laborit's technique has been that we are now able confidently to undertake the anaesthetic care of patients who previously would have caused great anxiety, or would have been considered unfit to withstand major surgical intervention.

Summary

A brief account is given of a simplified method of producing autonomic blockade, as a method of preventing surgical shock during and immediately after major operations. The patient's condition has been better, both during and after the operation, than when conventional anaesthetic techniques have been used.

We would like to thank our colleagues and the nursing staff of the hospitals at which this work has been done for their sustained interest, and also Messrs. May & Baker Ltd. for supplying the drugs used.

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THE BACTERIAL CONTENT OF HUMAN SMALL INTESTINE IN DISEASE OF THE STOMACH

BY

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It has already been shown (Cregan and Hayward, 1953) that when the human intestinal tract is healthy the small intestine is not colonized by a resident flora. Such organisms as are found there are so few in number that they must be regarded as transient contaminants passing through with the ingesta. The present work was undertaken to determine the effect of disease of the stomach on the flora of the small intestine. The results showed that neither a low gastric acidity nor the presence of a profuse flora in the stomach necessarily lead to the development of a resident flora in the small intestine. The antibacterial mechanism operating in the small intestine is therefore independent of the gastric germicidal barrier.

Experimental

The patients chosen for the experiment were undergoing operation for gastric or duodenal ulcers or gastric carcinoma. In addition, there was one patient with a subtotal gastrectomy of two years' standing and a small oesophageal hiatal hernia. He was operated on for recurring haematemesis and melaena. All had been given light nourishment and had then fasted for at least four hours before the operation.

The methods of collection and bacteriological examination of specimens and evaluation of results were exactly as previously described (Cregan and Hayward, 1953), and are stated only briefly here. The contents of the intestine were removed directly through the bowel wall with syringes. Thus the possibility of contamination was reduced to a minimum, the levels of the intestine sampled could be anatomically defined, and parts of the intestine remote from the diseased stomach but exposed during the operation could be sampled. A standard bacteriological procedure was followed with all specimens so that results could be assessed quantitatively as well as qualitatively, the degree of growth being graded from $\pm$ to ++++. It was shown (Cregan and Hayward, 1953) that + or $\pm$ growth indicated a transient flora and that ++ or +++ growth indicated a resident flora at the site sampled.

Results

Twenty-two cases were included in the investigation, and in each case the sites sampled were the upper jejunum, the mid-gut, and the lower ileum within 8 to 12 in. (20 to 30 cm.) of the ileo-caecal sphincter. In addition the stomach was sampled in all but four cases. The quantitative results are shown in Table I and the qualitative results in Table II.

Effect of Gastric Acidity and of Profuse Contamination of the Stomach

Of the 14 cases in which gastric acidity was determined, seven showed normal acidity or hyperacidity. The stomach, the upper jejunum, and the mid-gut were either sterile or contained only a transient flora in all of these seven cases. The lower ileum was colonized by a resident flora in three of them. These findings do not differ significantly from those in normal subjects. The remaining seven cases in which gastric acidity was determined showed hypoacidity or achlorhydria. In four of these (Cases 8, 9, 10, and 11) the

flora of the small intestine did not differ from normal, and in the other three both the stomach and the upper jejunum contained a resident flora, but by the time the intestinal contents had reached the mid-gut their bacterial content had been reduced to a transient flora. It is apparent that the subnormal gastric acidity of this group of cases did not affect the normal ability of the small intestine to prevent multiplication of bacteria in its lumen and to destroy large numbers of bacteria entering it from a heavily contaminated stomach.

Of the eight cases in which gastric acidity was not tested, six were of advanced gastric carcinoma and almost certainly had a low gastric acidity. The results from this group confirm the finding that when large numbers of bacteria enter a normal small intestine from a diseased stomach they are destroyed by the time the mid-gut is reached, if not earlier. In only two of the seven cases in which the stomach contained a resident flora (Nos. 17 and 21) did the profuse contamination persist even as far as the upper jejunum.

Cases 9 and 10, with only a transient flora in the stomach, indicate that lowered gastric acidity, even achlorhydria, is not necessarily accompanied by an increase of bacteria in the stomach.

Qualitative Results

The qualitative results are shown in Table II. As in the study of cases in which the intestinal tract was normal, the organisms found in the upper intestine in the present investigation were predominantly Gram-positive species of the general type more commonly associated with the mouth than with the lower intestinal tract. However, Gram-negative species of faecal type were found more often in this study, and in Table I a resident flora is designated oral or faecal in type. It must be noted that this designation is not intended to suggest the origin of the organisms.

In any one patient there was a correlation between the species found at each level of the tract. There was no apparent association between particular species and the disease or the general condition of the patient. In particular, *Candida albicans*, which has been said to be commonly associated with carcinoma of the stomach, and the toxin-

TABLE I.—Quantitative Results

Case No.	Gastric Acidity	Date	Disease	Operation	Stomach	Upper Jejunum	Mid-gut	Lower Ileum
1	Hyperacidity	13/7/51	Carcinoma of lower oesophagus invading stomach	Partial oesophagectomy. Total gastrectomy	—	—	—	—
2	"	6/7/51	Duodenal ulcer	Subtotal gastrectomy. Billroth I	$\pm$	$\pm$	$\pm$	+ (F)
3	"	2/10/52	"	Subtotal gastrectomy	N.T.	—	$\pm$	—
4	Normal	17/4/52	Duodenal ulcer. Pyloric stenosis	"	$\pm$	—	$\pm$	+ (F)
5	"	13/5/52	Duodenal ulcer. Small perforation and perigastric abscess	"	N.T.	$\pm$	$\pm$	+ (F)
6	"	12/9/51	Laparotomy	Gastrotomy. Biopsy of stomach	$\pm$	—	—	$\pm$
7	"	11/7/52	Gastric ulcer	Subtotal gastrectomy	N.T.	$\pm$	$\pm$	+ (F)
8	Hypoacidity	13/4/51	Gastric ulcer	Total gastrectomy	$\pm$	$\pm$	—	—
9	"	22/6/51	Large high gastric ulcer	Subtotal gastrectomy	$\pm$	$\pm$	—	—
10	Achlorhydria	10/6/52	Huge gastric ulcer penetrating liver and pancreas	Total gastrectomy	N.T.	$\pm$	$\pm$	=
11	"	4/5/51	Extensive carcinoma of cardia and upper end of stomach	Abdomino-thoracic exploration. Souttar's intubation	+ (O)	+ (O)	$\pm$	$\pm$
12	"	13/2/52	Advanced carcinoma of cardia of stomach; peritoneal deposits	Laparotomy	+ (F)	+ (F)	$\pm$	+ (F)
13	"	30/4/52	Carcinoma of gastric fundus invading pancreas and diaphragm	Total gastrectomy. Repair of diaphragm	+ (F)	+ (F)	$\pm$	+ (F)
14	"	9/7/52	Haematemesis and melaena following subtotal gastrectomy for ulcer two years previously. Oesophageal hiatal hernia	"	+ (O)	$\pm$	—	+ (F)
15	Gastric acidity not tested	24/10/51	Advanced carcinoma of stomach with peritoneal spread	Oesophago-jejunal anastomosis (short-circuit)	+ (O)	$\pm$	$\pm$	+ (F)
16	"	10/10/51	Advanced carcinoma of upper stomach. Peritoneal invasion. Liver metastases	Laparotomy	+ (O+F)	+ (O+F)	$\pm$	+ (O+F)
17	"	24/7/51	Advanced gastric carcinoma. Peritoneal spread and metastases	Subtotal gastrectomy	+ (O)	$\pm$	$\pm$	N.T.
18	"	18/5/51	Gastric carcinoma. Pyloric obstruction	Left thoraco-abdominal. Total gastrectomy. Splenectomy	—	—	—	+ (O)
19	"	29/8/51	Carcinoma of cardia and upper stomach	Total gastrectomy. Partial oesophagectomy. Splenectomy	+ (O)	$\pm$	$\pm$	=
20	"	2/7/52	Extensive gastric carcinoma invading oesophagus	Subtotal gastrectomy	+ (O)	+ (O)	$\pm$	+ (F)
21	"	20/3/51	Double gastric ulcer. Gastritis	"	+ (O)	—	—	+ (O)
22	"	2/10/52	Gastric ulcer	"	+ (O)	—	—	—

— = Sterile. $\pm$ = Transient flora ($\pm$ or + growth). + = Resident flora (++ or +++ growth). N.T. = Not tested. O = Flora of oral type. F = Flora of faecal type.

formers, *Cl. welchii*, *Str. pyogenes*, and *Staph aureus*, were closely watched, but their presence had no apparent significance.

TABLE II.—Qualitative Results

Site of Sampling	No. of Subjects	Gram-positive Species	Gram-negative Species
Stomach	18	<i>Str. mitis</i> (16) " <i>acidominimus</i> (1) " MG (2) " <i>uberis</i> (2) " <i>salivarius</i> (1) " sp., variety 2 (1) " <i>pyogenes</i> (1) " β -haemolytic streptococcus, not Groups A, B, C, or G (2) <i>Str. liquefaciens</i> (1) <i>Staph. aureus</i> (2) " <i>lactis</i> (3) " <i>saprophyticus</i> (1) <i>Lactobacillus</i> sp. (1) <i>Bacillus</i> sp. (1) <i>Cl. welchii</i> (4) <i>Candida albicans</i> (4) <i>krusei</i> (3) <i>Monilia parapsilosis</i> (2)	<i>Bact. coli</i> , type I (5) " Intermediate, type I (2) <i>Bact. aerogenes</i> , type I (1) " II (1) <i>Paracolon</i> sp. (1) <i>Pseudomonas</i> sp. (1) <i>H. influenzae</i> (1)
Upper jejunum	22	<i>Str. mitis</i> (19) " MG (4) " <i>uberis</i> (1) " <i>salivarius</i> (2) " s.b.c. (1) " sp., variety 2 (1) " β -haemolytic streptococcus, not Groups A, B, C, or G (1) <i>Str. faecalis</i> (2) <i>Staph. aureus</i> (2) " <i>lactis</i> (5) " <i>saprophyticus</i> (2) <i>Lactobacillus</i> sp. (4) <i>Bacillus</i> sp. (1) <i>Cl. welchii</i> (3) <i>Candida albicans</i> (3) <i>krusei</i> (3) <i>Monilia parapsilosis</i> (2)	<i>Bact. coli</i> , type I (5) " Intermediate, type I (1) <i>Bact. aerogenes</i> , type I (2) " II (2) <i>Paracolon</i> sp. (1) <i>Pseudomonas</i> sp. (1) <i>Veillonella gazogenes</i> (1)
Mid-gut	22	<i>Str. mitis</i> (13) " MG (5) " <i>acidominimus</i> (1) " <i>salivarius</i> (2) " sp., variety 2 (1) " <i>faecalis</i> (1) " <i>durans</i> (1) <i>Staph. aureus</i> (1) " <i>lactis</i> (3) " <i>saprophyticus</i> (1) <i>Lactobacillus</i> sp. (1) <i>Bacillus</i> sp. (1) <i>Cl. welchii</i> (3) " <i>multifermentans</i> (1) " <i>butyricum</i> (1) <i>Candida albicans</i> (1) <i>Monilia parapsilosis</i> (1)	<i>Bact. coli</i> type I (4) " Intermediate, type I (1) <i>Bact. aerogenes</i> , type I (1) <i>Pseudomonas</i> sp. (1)
Lower ileum	21	<i>Str. mitis</i> (8) " MG (3) " <i>salivarius</i> (5) " sp., variety 2 (1) " s.b.c. (4) " <i>pyogenes</i> (1) " β -haemolytic streptococcus, not Groups A, B, C, or G (2) <i>Str. faecalis</i> (2) <i>Staph. aureus</i> (1) " <i>lactis</i> (2) " <i>saprophyticus</i> (2) " <i>ofermentans</i> (1) <i>Lactobacillus</i> sp. (3) <i>Cl. welchii</i> (6) <i>Corynebacterium</i> sp. (2) <i>Candida albicans</i> (1) <i>krusei</i> (1) <i>Monilia parapsilosis</i> (1)	<i>Bact. coli</i> , type I (8) " Intermediate, type I (5) <i>Bact. coli</i> , Intermediate, type II (1) <i>Bact. aerogenes</i> , type I (5) " II (1) <i>Paracolon</i> sp. (7) <i>Pseudomonas</i> sp. (2) <i>H. para-influenzae</i> (1) <i>Achromobacter</i> sp. (1)

Discussion

In all these 22 patients undergoing gastric operations the mid-gut (lower jejunum or upper ileum) yielded at most a transient flora, although in 10 of the cases the gastric germicidal barrier was defective and the stomach was heavily contaminated. Even in the case of subtotal gastrectomy of two years' standing in which there had been prolonged reduction of stomach secretions the mid-gut yielded only a transient flora (actually $\pm$ growth). The other cases show that advanced disease of the stomach, with associated physiological and anatomical changes, does not encourage the development of a resident bacterial flora in the small

intestine. Therefore an antibacterial mechanism, distinct from that of the stomach, must operate in the small intestine. Failure to recognize that there are two independent mechanisms and that the stomach mechanism may be defective and the small intestine mechanisms be intact has led to the widely held misconception that if the gastric secretions are reduced or absent organisms from the large bowel will invade the small intestine. For example, Wells and Welbourn (1951) state that achlorhydria following gastrectomy causes "bacteria which normally inhabit the colon to grow freely all the way up the small intestine and in the gastric stump." This view has arisen from studies of samples, generally only from the duodenum and the stomach, removed by passing a tube via the mouth (Knott, 1927; Rices, Sears, and Downing, 1928; Torrey, Kahn, and Salinger, 1930; Dick, 1941, quoted by Bethell *et al.*, 1942; French and Thompson, quoted by Frazer, 1949).

The results reported here show that a consideration of a single specimen from the upper small intestine could be misleading. The upper jejunum was heavily contaminated in 5 out of 10 cases in which the stomach contained a resident flora (Table I), but the scarcity of organisms further on in the mid-gut in all cases showed that this was not due to an invasion from the large intestine but to an abnormally heavy intake of organisms from the diseased stomach. In all cases reported here the antibacterial mechanism of the small intestine was functioning, whether gastric acidity was increased, decreased, or normal.

Further, this misconception has led to the suggestion that vitamin-B deficiencies in the post-gastrectomy syndrome (Welbourn, Hughes, and Wells, 1951; Wells and Welbourn, 1951), in the sprue syndrome, and possibly also in pernicious anaemia, pellagra, and nutritional megalocytic anaemia (Frazer, 1949) arise because bacteria invading the small intestine deprive the host of vitamins. This suggestion cannot rest on the fact that the stomach secretions are deficient. Until it has been shown that the small intestine's antibacterial mechanism is defective in these cases the theory has no sound foundation.

The work of Sinek and Reimann (1931) supports the findings reported here. They found that low gastric acidity was not necessarily associated with an increase in the incidence of *Bact. coli* in the duodenum.

More recently Barber and Franklin (1946), who examined swabs taken from the stomach and duodenum during stomach operations, found that, although the stomach was infected in 25 out of the 50 cases they examined, the duodenum was infected in only seven. They do not draw special attention to this fact, and the misconception has persisted in spite of their work.

No indication of the factors that determine whether a resident flora is established in the lower ileum can be seen from this work. Whereas 12 out of 21 cases yielded a profuse ileal flora in these cases of disease of the stomach, only 2 out of 14 did so when the intestinal tract was normal (Cregan and Hayward, 1953).

Summary

In cases of disease of the stomach presenting for operation the small intestine was found to contain only a sparse transient population, irrespective both of gastric acidity and of the degree of contamination of the stomach.

It is deduced that the small intestine has an antibacterial mechanism which is independent of the gastric germicidal barrier.

We would like to thank Professor S. D. Rubbo, professor of bacteriology, University of Melbourne, for his constant helpful advice; Mr. E. S. R. Hughes, acting out-patient surgeon, Royal Melbourne Hospital, for providing the specimens of two of the cases; Dr. Jacqueline Walker for assistance with the identification of species of *Candida*; the staff of the Royal Melbourne Hospital; and Miss Marjorie Krohn for technical assistance. One of us (J. C.) was in receipt of a personal grant from the National Health and Medical Research Council.

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TREATMENT OF ACUTE PANCREATITIS WITH HEXAMETHONIUM BROMIDE

BY

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In 1889 Fitz described three types of acute pancreatitis—haemorrhagic, gangrenous, and suppurative—based on the gross pathology of the gland. McWhorter (1932) collected 64 cases and classified them as follows: (1) acute or subacute pancreatitis in which there was no haemorrhage but in which the gland was enlarged, oedematous, and very hard; (2) the haemorrhagic, in which haemorrhages were present but there was no evidence of gangrene or suppuration; (3) cases with gross necrosis or gangrene but no suppuration; and (4) cases with suppuration or definite abscess formation.

A classification on an aetiological basis suggested by McWhorter (1932) and Jones (1943) adds little to our knowledge.

A. Infectious Origin.—(1) By extension along the lymphatics; (2) by extension from the blood stream; (3) by extension along the pancreatic ducts, from the duodenum or from the bile ducts; (4) by direct extension from infected foci; (5) following activation of bacteria in the normal gland; (6) by bacterial permeability from adjacent diseased viscera.

B. Non-infectious Origin.—(1) Mechanical, including stasis in the ducts. (2) Chemical, and originating in activated ferments resulting from (a) bile; (b) duodenal contents; (c) degenerated duct contents; (d) autolysis. (3) Degenerative changes in the pancreas: (a) secondary to benign or malignant tumours; (b) resulting from vascular degeneration or haemorrhage; (c) toxic changes following systemic disease. (4) Trauma.

C. A Combination of Two or More of the Above Factors.

The disease most commonly occurs in the fifth and sixth decades in obese males. Bisgard and Baker (1940) pointed out the frequent association of cholelithiasis. The disease may affect the whole gland or may be limited to the head, the body, or the tail. The extent of necrosis depends upon the violence of the biochemical explosion. If small areas alone are involved they may be absorbed or converted into fibrous tissue; but, if large, the necrotic areas soon slough or suppurate.

Ian Aird (1949) states that "a complicated network of theory has been woven around pancreatitis in order to relate it to gall-bladder disease but without any conclusive or all-embracing theory." We believe that pancreatitis is due to a vascular accident and that the findings of biliary pathology are coincidental.

One of us was impressed with the similarity in pathology of thrombosis and embolism in other organs, and treated with systemic heparin two cases of acute pancreatitis confirmed by exploratory laparotomy. The results were satisfactory, but led to a continuous ooze of blood from the suture line in each case. Although pain was relieved the loss of blood from the suture lines was sufficient to require intravenous blood transfusion. We concluded that the systemic heparin may have been responsible for the recovery of these two cases, which we classified, according to McWhorter's criteria, as gangrenous lesions of part of the head.

The following two cases were treated with hexamethonium drugs, and had a very smooth convalescence.

Case 1

An obese male aged 64 had been in good health until the morning of May 5, 1952, when he was seized with a sudden agonizing abdominal pain. It was located around the umbilicus and the left flank.

On examination he was found to be very shocked, and was frequently vomiting small amounts of bile-stained fluid. His face was livid and beaded with sweat, and the extremities were cold and damp. The abdomen was uniformly rigid, with maximum tenderness around the umbilicus. No other abnormal physical signs were discovered. A provisional diagnosis of pancreatitis was made. This was confirmed by exploratory laparotomy. The relevant findings were an injected peritoneum and a hard oedematous dusky-red pancreas with darker patches in the head. The proximal 3-4 in. (7.5-10 cm.) of the small gut was distended and scattered and traced with lymphatic vessels. The omentum revealed fat necrosis. The biliary tract was normal on palpation. The abdomen was closed without drainage.

The day following exploratory laparotomy the patient remained in great pain, and for this reason a bilateral posterior splanchnic block was performed with 1/2,000 amethocaine. The relief from pain was dramatic and the improvement in the clinical condition most marked. Pain began to return after complete control for approximately six hours. It seemed reasonable to believe that ganglion-blocking agents, such as hexamethonium, would similarly relieve pain, and that administration of this drug would have none of the difficulties or dangers of repeated splanchnic blocks. Oral hexamethonium bromide, 250 mg., was given via the indwelling Ryle's tube twice a day, and the activity of the drug was observed by blood-pressure readings, carried out by the nursing staff. Pain disappeared after six hours, and the next day it was possible to assess the patient as convalescent. Treatment with hexamethonium was continued for five days, the patient being discharged, cured, on the tenth day. He remained well up to the time of submitting this report.

Case 2

This patient was a man aged 52. His history was complicated by a previous perforation of a peptic ulcer six years previously. Three years before his present illness he was subjected to gastrectomy, this being followed by a complete remission of his indigestion.

On the day of admission (August 9, 1952) he was seized with violent upper abdominal pain, mainly localized to the right hypochondrium. He frequently vomited small amounts with each severe attack of pain, which appeared to be colicky in type. The abdomen was explored and a considerable quantity of free sero-sanguineous fluid was found. The great omentum was studded with islets of fat necrosis and several feet of the small intestine was injected, distended, and traced with lymphatic vessels. The pancreas was hard, oedematous, and of a deep-red colour over the whole visible surface of the gland. The biliary tract felt normal on palpation. The abdomen was closed without drainage.

Hexamethonium, 250 mg., was given as soon as the patient was conscious, and this was continued twice a day for the next seven days, four-hourly blood-pressure readings

again being carried out by the nursing staff. The following day he was pain-free, and convalescence was smooth and uneventful. He was discharged fit and well 12 days after operation.

Discussion

The treatment of acute pancreatitis has previously been based on its frequent association with cholelithiasis. It is our opinion that the findings of biliary calculi are coincidental, and that the pathological changes in the gland can be explained wholly in terms of a vascular catastrophe. The more serious or fulminating lesion can be explained by thrombosis or embolism of a main pancreatic vessel. Certainly the appearance of the gland at operation is supportive evidence, but the picture is clouded by the biochemical action, which releases a sanguineous or sero-sanguineous fluid rich in pancreatic ferments. If small areas only are involved they may be absorbed, converted into fibrous tissue, or calcified. It is impossible to reverse a pathological process which has involved sloughing or abscess formation, and this parallel may be seen in the upper or lower limb when embolism or thrombosis occurs in a main vessel. Survival of an organ depends on the location of the thrombosis or embolism, the state of the collateral vessels, and the presence or absence of vasospasm.

It is reasonable to suppose the same vascular phenomena take place in the pancreas, but the exact nature of the process must remain a matter of conjecture.

Andrew Dale (1952) reported optimistic results from the treatment of acute pancreatitis with splanchnic blocks. Our own experience of a single case before this publication supports his findings, but the mode of action is not understood. Ganglion-blocking drugs seem to produce an excellent result. The disease is robbed of its terrorizing pain. It, of course, cannot affect the established gangrenous or suppurative process in a gland which must be subjected to drainage.

In our experience exploratory laparotomy is indicated even if there appears to be no doubt about the diagnosis, as an assessment of the degree of destruction of the gland is then possible, and in the case of gangrenous, sloughing, or suppurative lesions drainage of the gland is indicated. Associated cholelithiasis should be ignored unless the pathology can be directly related to "inflammatory changes" in the pancreas. The inflammatory changes bear a striking resemblance to thrombosis or emboli of the main vessels to other intra-abdominal organs and the upper and lower limbs. Gangrene, sloughing, and suppuration follow gross disturbances of the blood supply, and the severity of the symptoms may be related to the extent of the infarction.

We feel, however, that types 1 and 2 of Fitz's classification might well be treated with drugs of the methonium group. In the cases reported hexamethonium was chosen arbitrarily. Each member of the methonium group varies in effect from ganglion to ganglion, and it may well be that some other member of the group would have a more pronounced action on the splanchnic ganglion. Paton (1951) suggests that tetramethonium may have this action.

In our two cases the relief of pain and the improvement in the general clinical condition were contrary to previous experience. We feel that a vascular catastrophe is the causative factor in acute pancreatitis, and further investigation along these lines may lead to a better understanding of the disease and simplify the treatment.

ADDENDUM.—Since submitting this paper for publication two further cases have been treated with equally successful results. Case 3, a man aged 62, admitted with severe abdominal pain, general collapse, and urinary diastase of 75. Diagnosis was confirmed by exploratory laparotomy, and he was treated with hexamethonium bromide. He was discharged on the tenth post-operative day and has remained free of symptoms for five months. Case 4 was that of a man of 72 with typical acute abdominal pain. The urinary diastase was 68. Exploratory laparotomy confirmed the diagnosis, and treatment with hexamethonium relieved him of his pain. He was discharged from hospital on the twelfth day and has remained free from symptoms for four months.

We are grateful to Mr. Edward Muir for his interest and co-operation.

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LOCAL EFFECTS OF CERTAIN MEDICAMENTS ON THE TEETH

BY

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It is a common experience for dental surgeons to be confronted by small children, aged from 2 years upwards, suffering from gross caries of their deciduous dentition. This condition may arise from a variety of causes, and it is often difficult to decide what is the principal factor in a particular case. If, however, a child known to have normal dental structures suddenly develops rapid decay affecting particularly the labial and buccal surfaces of his teeth, the possibility of chemical damage must be considered. It has been observed that such damage often occurs after the protracted use of some of the commonly used iron tonics.

Certain of these iron tonics are very acid. Representative samples, tested with a Cambridge pH meter, gave the following hydrogen-ion concentrations:

	Undiluted pH	Diluted to 50% with water pH
Syr. ferr. phosph. co.	1.5	1.9
Mist. ferr. sulph. pro infant., N.F.	1.67	2.28
Elix. ferr. glucon., R.F.H.	3.52	3.8
Mist. ferr. et ammon. cit., N.F.	6.66	7.7
"Colliron"	8.56	8.87

The deleterious effect of acids on the teeth is well known. McClelland (1926) showed that teeth left in a solution of pH 4.5 for twelve hours suffered some degree of decalcification, and Stafne and Lovstedt (1947) reported many cases of dental damage following the prolonged and regular sipping of pure lemon juice (pH about 2.5). Hardwick (1950) has demonstrated that the amount of enamel decalcification that occurs when a tooth is immersed in an acid solution does not depend entirely on the pH of the solution but also on the nature of the acid. For example, N/100 lactic acid, with a pH of 2.9, in some circumstances produced etching of the enamel, whereas N/100 hydrochloric acid (pH 2.0) did not.

A laboratory test to ascertain the effect on the teeth of certain stock iron tonics was carried out. Sound teeth were suspended for a week in the various liquids at blood temperature with part of the crown immersed beneath the surface. In this case the resultant degree of damage to the teeth was proportional to the acidity of the solution. Syr. ferr. phosph. co. caused the most damage, the exposed enamel flaking freely away from the cusps of the tooth. Mist. ferr. sulph. produced severe etching and decalcification of the enamel, which could be scraped off the surface with a finger-nail. Elix. ferr. glucon. produced very slight etching, with milky-white decalcified areas. No macroscopical effect was observed on the teeth immersed in mist. ferr. et ammon. cit. or colliron.

It is the custom to advise that some iron tonics, notably Parrish's food, should be taken through a straw or a glass tube, but this presents practical difficulties, and in small children the parent usually gives it undiluted from a teaspoon. If this practice is continued for long the teeth often present a typical clinical picture—decalcification of the labial surfaces of the upper incisor teeth, usually accompanied by dental caries. If, as is often the case, the tonic is sweetened with syrup, the risk of caries will be considerably increased. In severe cases the teeth eventually disintegrate, break off level with the gum, and leave roots that quickly become diseased.

Syrup *per se* has been observed to cause damage to the teeth. The original sugar dummy, where the parent wrapped a lump of sugar in a handkerchief and thrust it in the child's mouth, has been popularly superseded by the immersion of a rubber dummy in rose-hip or blackcurrant syrup before use, with frequent replenishments throughout the day and night. This, if continued for any length of time, results in a startling destruction of nearly all the teeth. The pH of a popular brand of blackcurrant syrup is 3.

It is not suggested that dental damage invariably follows the use of iron tonics. The amount of harm depends on the acidity of the tonic; on the frequency, length, and method of administration; and on individual susceptibility. But the regular introduction into the mouth of highly acid and syrupy fluids is obviously a potential risk to the dental structures.

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Medical Memorandum

Spontaneous Rupture of the Oesophagus Treated by Operation

Although, following Barrett's comprehensive review in 1946, the symptomatology of spontaneous rupture of the oesophagus is firmly established, failure of recognition remains the greatest impediment to successful treatment. If the diagnosis is made early, and immediate operative repair effected, the patient has an excellent chance of complete recovery. It is clear from recent reports, both British and American, that, in spite of the occasional survival of a patient after repeated thoracentesis, plus delayed drainage of the pleural cavity or of a localized abscess, the treatment of choice is immediate operation, and the transpleural approach seems preferable to the mediastinal one. To the growing list of successful cases the following is added.

CASE REPORT

On January 4, 1950, a manual labourer aged 53, without previous history of digestive upset, was admitted to hospital with the complaint of severe left-sided pain of six hours' duration. He had been celebrating the New Year holiday by an indulgence in alcohol much beyond his wont, and he felt rather seedy when he returned to work on the 4th. At the mid-day break he ate, without appetite, his lunch, and thinking that some beer might act as a stimulant he drank a pint, and felt, if anything, rather worse. He thereupon, in continued hope, had a second pint, and he had not long finished it when he felt sick, and brought up a large vomit of food and beer. He continued to feel uncomfortable and he retched violently, and as he did so was seized with a sudden excruciating pain in the left side about the lower part of the chest. He distinctly remembers that he had expected to vomit on this occasion, but did not in fact do so. The pain was so agonizing that he was almost struck to the ground. He was helped to his home, and six hours later, about 6.30 p.m., was admitted to hospital. The original pain over the left chest was still present, and it had spread across the epigastrium and through to his back between his shoulder-blades.

On admission he was pale, distressed, and sweating; his temperature was 96.8° F. (36° C.), pulse 112, respiration 22, and blood pressure 110/85. There were dullness and diminished air entry over the left lung base, and some tenderness but no rigidity in the epigastrium. He was originally thought to be suffering from pneumonia. At 10.30 p.m. his blood pressure had fallen to 98/70 and his pulse had risen to 150, while the left lung base was completely dull on percussion and breath sounds were absent. The left chest was needled and brown turbid fluid, smelling of beer, aspirated. No subcutaneous emphysema was observed. At this stage a diagnosis was made of spontaneous rupture of the oesophagus with perforation into the left pleural cavity, and arrangements were put in hand for operation, an intravenous plasma drip being set up. In spite of this and the administration of morphine, the patient continued in great pain and severe shock.

Operation was carried out at 1.30 a.m., the left thoracic cavity being opened through the bed of the eighth rib. About 2 pints (1.1 litres) of opaque brown fluid, smelling of beer, welled out of the pleural cavity and there was considerable contamination of the cavity with food particles. A ragged tear about 2 in. (5 cm.) long was found in the pleura over the lower end of the oesophagus, and a longitudinal tear about 1 in. (2.5 cm.) in length in the left postero-lateral wall of the oesophagus an inch or so above the diaphragm. The rent in the oesophageal wall was clean-cut and healthy-looking, the tissue around it greyish black and necrotic. It was notable that whenever the pleural cavity had been cleared of stomach contents the condition of the patient greatly improved. The rent in the oesophagus was easily repaired with interrupted catgut sutures, and the wound in the chest wall closed, the pleural cavity being drained through a stab wound.

The next day the patient's condition was satisfactory and it remained so. Fluids were allowed by mouth on the second post-operative day. Convalescence was somewhat retarded by a haematoma at the posterior end of the thoracotomy wound, and a slight purulent discharge from the stab wound, so that he did not leave hospital until February 1. On his discharge he felt reasonably fit but was troubled with a slight cough. He was referred back to hospital on February 17 because of increasing breathlessness and cough. X-ray examination then showed an abscess cavity in the lower lobe of the left lung. While the patient was awaiting admission to the thoracic unit he coughed up the contents of the abscess, and thereafter the pulmonary infection rapidly resolved. He returned to work in April and has been in full work since and in excellent health.

COMMENT

The history of the abortive vomit with sudden agonizing pain and collapse in a previously healthy man, the profound shock, only partially alleviated by plasma transfusion, the resistance of the pain to morphine, and the rapidly increasing dullness at a lung base suggested the diagnosis: the aspiration from the left pleural cavity of stomach contents confirmed it. The absence of clinical evidence of surgical emphysema may be accounted for by supposing that the gastric contents, having ruptured the oesophagus, very rapidly tore a large gap in the left pleural membrane, and that gastric contents and air found a readier egress into the pleural cavity than into the tissues of the mediastinum. This case supports the view that the best hope for patients with spontaneous rupture of the oesophagus is early operation, and that much time should not be lost in pre-operative attempts to overcome shock completely, for this end is unlikely to be achieved except by operation.

I wish to thank Dr. James Brown and Mr. David Proctor for making the diagnosis, and Dr. James Stewart for the excellent anaesthetic management of a very ill patient.

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Reviews

RESEARCH IN WARTIME

History of the Second World War: Medical Research. Edited by F. H. K. Green, C.B.E., M.D., F.R.C.P., and Major-General Sir Gordon Covell, C.I.E., M.D., D.T.M.&H., D.P.H. (Pp. 387. 40s.) London: H.M. Stationery Office. 1953.

This volume of the official history of the second world war describes the achievements of medical research undertaken for purposes connected with the war and sponsored by the Medical Research Council, the fighting Services, and other Government departments. Although some purely clinical subjects are excluded, the field covered is wide, especially since some of the matters brought in have a tenuous connexion with the war effort, or belong largely to the periods before or after the war: examples are the Prophit survey, the vole bacillus vaccine, a survey of mycoses, partition chromatography, and the use of radioactive isotopes. There is an excellent account of work done by scientists in conjunction with Service personnel to improve the safety and efficiency of the combatant. The variety of this work and its influence even on the design of weapons and other equipment will surprise anyone not familiar with it. The prevention of infection in wounds and burns, the nature of shock, blast injury, the transfusion of blood and blood products, and "chemical defence research" (with emphasis on B.A.L.) also naturally find their place. Descriptions are given of the development of penicillin, of new methods for preventing or treating typhus and malaria, of studies of epidemic hepatitis and serum jaundice, hospital cross-infection, and air disinfection. A chapter is given to the nutritional studies on which our rationing system was so successfully based and to treatment of starvation as seen at such places as Belsen.

The book is full of interesting and unfamiliar information. How many people know, for instance, that whole serum was issued as tetanus antitoxin early in the war to save the time needed for purification, that portions of the International Standards for antisera were sent to Canada in 1940 for safety, that a passenger lost both hands from frostbite after being ferried across the Atlantic in a bomber, that conscientious objectors were used for experiments on the transmission of scabies, that anaesthetized volunteers were used to determine whether life-saving jackets would safely support an unconscious man, or that the discovery of *Br. melitensis* infection in cattle once led to a suspicion of bacterial sabotage? Although many contributors were responsible, the editors have clearly played a large part in producing this volume, since its style is singularly uniform and lucid. It worthily places on record the achievements of perhaps the most fruitful period of research in our history, a period when every task was urgent and every first-class brain was ready to help in furthering it. Each chapter has an ample bibliography, and readers for years to come will find this a valuable work of reference.

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INTRODUCTIONS TO GENERAL PRACTICE

An Approach to General Practice. By R. J. F. H. Pinsent, M.A., M.D.(Cantab.). With foreword by Sir Lionel Whitby, C.V.O., M.C. (Pp. 166. 12s.) Edinburgh and London: E. and S. Livingstone. 1953.

An Introduction to General Practice. By D. Craddock, M.B., Ch.B., D.Obst.R.C.O.G. With foreword by Sir Heneage Ogilvie, K.B.E., D.M., M.Ch., F.R.C.S. (Pp. 552. £2 2s.) London: H. K. Lewis. 1953.

These two books by obviously able and conscientious general practitioners are well worth reading.

Dr. Pinsent takes the young doctor through his first surgery and then introduces him to the office work of general practice, to his colleagues, and to his patients. The chapter on the mind of a doctor is full of wisdom and understand-

ing. He puts in a plea for research and welcomes the College of General Practitioners. He demands the highest clinical standards and urges the young practitioner to get some professional work outside general practice so as to avoid letting his mind become hidebound. Dr. Pinsent has an observant eye and an inquiring mind. He knows precisely when to consult, when to send to hospital, and when to treat on his own. Perhaps for this reason he is slightly condescending towards consultants, though he correctly describes the etiquette of a domiciliary consultation. He is full of self-assurance and pride in his work. These are admirable qualities, but they may be the cause of stumbling. Even with open x-ray departments and pathological laboratories many practitioners admit that they consult not only to have a diagnosis confirmed but also to find out what is wrong or how to treat. It is no doubt useful to have guidance about the sort of condition which requires hospital treatment and the sort which should be treated at home, but it is unwise to make set rules. It is also unwise to give the impression that sending a patient to hospital relieves the general practitioner of all responsibility. Sending a patient to hospital should be like calling in a consultant. To consult, as Dr. Pinsent shows, is to share but not to shed responsibility.

Dr. Craddock has written almost a textbook. He discusses briefly and "tidily" the conditions commonly met with in practice, dealing more fully with mother and child and family planning. His wide knowledge will be the envy of his colleagues. His detailed account of the techniques and prescriptions used in practice will be invaluable to old and young. His style is didactic and his opinion sometimes open to criticism. Not everyone believes in the virtue of adrenaline cream. He, too, demands a high clinical standard and holds a firm belief in the value of the general practitioner not only as a physician but as a philosopher.

Such a textbook accentuates the difference between hospital practice and general practice. The difference exists, but, if there is a fundamental difference of method in, for example, history taking and clinical examination, there is a danger that general practice may come to have a mystique as well as a technique of its own. This will widen the gulf. Men such as registrars having been trained in hospital will not accept nor be accepted by the mysteries of general practice. Only the young men with little hospital experience will find an entrance. If that occurs there is something wrong either with medical education or with general practice.

These books will be helpful if they are used to crown but not to supplant the training and ideals learnt in a good medical school. General practice must advance in step with the advances of medicine, and these are made in hospitals. Only a close association with hospital work will enable a general practitioner to keep abreast. Only close association with general practitioners will enable the hospital to keep a sense of proportion and humanity.

C. W. WALKER.

MORE SOCIAL MEDICINE

Social Medicine. By S. Leff, M.D., D.P.H., Barrister-at-Law. (Pp. 297. 28s.) London: Routledge and Kegan Paul. 1953.

This volume is the first of a series integrated to form a survey of human biology, and to be written by a number of authors. It is intended to provide a guide for doctors and other health workers in the exploration of social medicine. The author defines social medicine, but, like so many others before him, fails to provide a definition which is both concise and clear. The preface envisages possible criticism of the book on the grounds of undue emphasis on environmental and social factors. Any criticism on that score would be quite unjustified: environmental conditions have been too much neglected in recent years by the medical profession, and any trend in the opposite direction is to be welcomed rather than deplored. The vast industry of the

author is obvious from the text, and from the long list of his sources, which are fully catalogued and carefully referenced. The index is comprehensive and accurate. The paper, printing, and binding are excellent.

Dr. Leff looks far beyond the frontiers of this country: his outlook on social medicine is international in character, and that is good. There is a tendency here and in America to be too engrossed in the work near at hand and to forget that it is the duty of the advanced and fortunate countries to provide the greatest possible help to the backward peoples of the world. This book gives many striking examples of appalling conditions in some countries abroad, and will help to make conscience less easy and effort in aid more intense.

The language at times lacks precision. Some of the statements are too sweeping: for example, "diabetes . . . is cured by an injection of insulin," and "asthma is caused by a spasm of the bronchioles, and is cured by drugs which relieve the spasm." It all depends on what is meant by "cured"—the chronic asthmatic might well argue wheezily about that. Then there is a statement that diphtheria immunization was not introduced into Great Britain until 1941; it was, in fact, commonly practised in this country so long ago as 1927, and in one English city alone 16,000 persons were immunized against diphtheria in 1935.

This book is well worth reading, but I am unable to commend it as unreservedly as I did the author's previous book on the health of the people.

C. METCALFE BROWN.

A HOMOSEXUAL'S VIEW

The Homosexual Outlook: A Subjective Approach. By Donald Webster Cory. With an introduction by Dr. Albert Ellis. (Pp. 326. 18s.) London: Peter Nevill. 1953.

The publication in an English edition of this book must be considered timely (perhaps almost too timely!) in view of the excited interest in the problem of homosexuality existing at present. The book is unique in the history of serious homosexual literature in the sense that it is a comprehensive sociological study written by a self-avowed homosexual, who is neither a physician nor a lawyer. The problem is, therefore reviewed from the inside, as it were, as well as objectively. This approach is in a way advantageous, for no one can be held to be altogether detached and objective in dealing with an emotionally overcharged problem of this kind.

The appearance of *Sexual Behaviour in the Human Male* (the first volume of the Kinsey Report) came as a startling revelation to the public, lay and medical alike, of the vastness of the homosexual problem. This book provides information on the nature (rather than the extent) of the problem which will surprise the reader, even if he regarded himself as already knowledgeable. Mr. Cory maintains that, from the sociological point of view at any rate, homosexuality should be regarded and treated as an important minority problem in the same way as colour prejudice, anti-semitism, and anti-Catholicism in Protestant countries (and anti-Protestantism in Catholic countries), and similar problems that have to be dealt with. It is for that very reason that objective judgments are so seldom forthcoming, for the hostile emotions aroused in the majority groups at the worst vitiate sound evaluation, and at the best give rise to biased rationalizations.

As to the efficacy of analytical psychotherapy in any of its forms in the treatment of psychosexual inversion, the author maintains that well-established homosexuality can never be eliminated. All that it can serve to do is, in certain cases, to release whatever heterosexual potentialities there may be in the patient's make-up by freeing him from his irrational fears and guilt-feelings. While this may help in bringing about a more satisfactory social adjustment, it cannot be regarded as a "cure."

As to the moral-theological aspect of the question, many will find themselves in disagreement with the author; but this side of the problem should not be allowed to bedevil

the reader's outlook, provided he consistently distinguishes between the concept of sin and that of crime, as all sound moral theologians should do.

Without comment I conclude this short review with a quotation from Dr. Albert Ellis's introduction: "All told, *The Homosexual Outlook* is by far the best non-fictional picture of the American homosexual and his problems that has yet been published. It is *must* reading for all inverts and for everyone who wishes clearly and fully to understand the question of homosexuality. It is a decidedly serious, honest, discerning, moving and creditable piece of work. Even those who most violently disagree with its views will find this volume to be stimulating and worthwhile reading."

E. B. STRAUSS.

VOMITING IN INFANCY

Les Vomissements du Nourrisson. By Emilio Roviralta. (Pp. 240; 80 figures. 1,800 francs.) Paris: Editions Médicales Flammarion. 1953.

Vomiting in infancy has been described by a medical student as a headache to parents and doctors; and when this assessment is apt—as in some of the recurrent, cyclical, and chronic cases—the chief reason is uncertainty about the cause. Professor Emilio Roviralta, who has had a long experience of paediatric surgery in the Polyclinic of Barcelona, has done a notable service to clinical medicine, as well as to paediatric surgery, by preparing this study. He exposes and attacks some of the false teaching about vomiting in infancy, and pleads for accurate case-taking, careful clinical examination, and the more general use of radiography. This is the road leading to correct diagnosis, and therefore to appropriate treatment.

At many centres in Britain the advice tendered so skilfully and authoritatively by Professor Roviralta is already followed, and abnormal conditions such as partial hernia of the stomach, diaphragmatic hernia, chronic duodenal stenosis, broncho-oesophageal hernia, and oesophageal atresia, with their puzzling clinical symptoms, are well known and are considered in differential diagnosis. But even in these centres much could be learnt from reading and pondering over this book, which has the great merit of being based on the personal experience of a worker who thinks clearly and honestly. His conclusions are especially valuable because they have had to find their way through a finely critical sieve. There is emphasis on many points of practical importance: for instance, the radiologist should be specially experienced in paediatric radiology; the vomiting baby may choke himself by inhaling food; and to give barium to a baby whose oesophagus is stenosed is likely to be dangerous. These facts, and many others to which the author refers, should be more widely known, and the volume is likely to be of interest not only to the experienced paediatrician and paediatric surgeon but also to the younger clinician, who will be stimulated by the scientific integrity of the work and its presentation. Radiographs are published to illustrate the reports, and there is a long bibliography.

NORMAN B. CAPON.

Though thriving on decay and often the cause of it, the fungi have yet given man many priceless benefits; high among them are penicillin, ergot, and Château Margaux '29. A few species out of this great host of parasites and saprophytes cause diseases with which we are familiar; many more destroy crops and have on occasion brought starvation by causing potato famines; others, again, reduce dwellings to dust—dry rot having been at least the physical cause of the fall of the House of Usher. An excellent account of these ubiquitous and influential plants has now come from the pen of Dr. John Ramsbottom under the title *Mushrooms and Toadstools* (Collins, 30s.). He writes for the layman, though he does not stoop to popularize a serious study, giving a discursive and often amusing account of his subject, on which he is an international authority. Doctors with a bent for natural history will enjoy this book, and it may be particularly commended as a Christmas present. It is well produced and contains many beautiful illustrations in colour and monochrome.

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HYPOTHERMIA

In the past little attention has been paid to the fluctuation of body temperature in a patient undergoing a major surgical operation, but in recent months the increasing interest in induced hypothermia has raised the question whether the maintenance of a normal body temperature is desirable at all times. The fact that a fall in body temperature is accompanied by a corresponding reduction in the oxygen consumption of the tissues led to the suggestion that hypothermia might be helpful when, in cardiac and cerebral surgery, the interruption of blood flow to the vital organs is contemplated. Various methods have been proposed for reducing the body temperature in man. First, the temperature of the patient's environment can be lowered after routine induction of anaesthesia, controlled at such a depth as to prevent shivering. This reduction of temperature is achieved either by immersion in cold water,¹ by a draught of cold air,² or by a cooling blanket.³ A second method is to create an artificial arterio-venous fistula and cool the blood during its passage through the fistula.⁴ And, thirdly, French authors⁵ have recently claimed that a combination of drugs—the "lytic cocktail," containing pethidine, promethazine ("phenegan") and chlorpromazine ("largactil"), which is thought to be the most active constituent—has a specific action on the thermo-regulating mechanism and autonomic system and thereby lowers the patient's body temperature.

Chlorpromazine has been developed from the alkylamine derivatives of the aromatic base phenothiazine. It is said to be almost completely devoid of anti-histaminic activity, but it has several incompletely defined actions on the central nervous system, including central depression extending particularly to the vomiting centre and possibly to the sensory, motor, and autonomic activities of the thalamus and hypothalamus. In addition to exerting these central effects, chlorpromazine is reported also to be an anti-adrenaline compound.

Elsewhere in this issue Dr. J. W. Dundee and his colleagues and Drs. A. Smith and J. G. Fairer report the first two series in this country of the use of the "lytic cocktail" as a new method of anaesthesia for

poor-risk patients undergoing surgical operations. In both these series the majority of the operations performed were for either gynaecological or abdominal conditions. As the theoretical advantage of the use of hypothermia in such cases is based on the reduction of metabolism it is interesting to note that in Dr. Dundee's series the average fall in body temperature of 3.4° C. was accompanied by a fall of oxygen consumption of approximately 20%. In one patient the body temperature was reduced nearly 10° C., yet the oxygen consumption fell by only 10%. This case emphasizes the danger of shivering, even at such low temperatures, for if it is not properly controlled it must necessarily throw an extra load on the circulation and increase the risk of ventricular fibrillation. The fact that these drugs produce an autonomic blockade in man is confidently expressed by Dr. Dundee and his colleagues in the title of their paper, but they do not present any evidence to corroborate such a view. It is possible that their findings might be accounted for on the basis of depression of the central nervous system. The mortality of 20% (hypothermia being a contributory cause of two deaths) in this series of 25 cases is a salutary warning to other anaesthetists eager to use this technique, and note should also be taken of the incidence of post-operative complications, including vomiting, haemorrhage, prolonged hypotension, and a sudden fall in blood pressure. These findings by experienced observers make it easier to place some of the previous extravagant claims for this technique in their correct perspective. It is perhaps a pity that the Liverpool team did not study the use of chlorpromazine alone, for more knowledge of the actions of this much discussed drug is still needed.

In their studies on the use of hypothermia in animals Dr. Dundee and his colleagues made a number of interesting observations. First, whether they used deep pentobarbitone anaesthesia, light pentobarbitone anaesthesia and muscle relaxants, or the "lytic cocktail," they found that all three methods brought about approximately the same rate of fall in body temperature. Further, they concluded that the value of pethidine and promethazine ("phenegan") in reducing metabolism and preventing shivering was dubious. These findings might suggest that, provided sufficient depression of the shivering reflex was obtained, the "lytic cocktail" possessed no great advantage over more familiar methods of anaesthesia.

¹ Churchill-Davidson, H. C., McMillan, I. K. R., Melrose, D. G., and Lynn, R. B., *Lancet*, 1953, 2, 1011.
² Beard, J., *ibid.*, 1953, 2, 1099. (Letter.)
³ Bigelow, W. G., Lindsay, W. K., Harrison, R. C., Gordon, R. A., and Greenwood, W. F., *Amer. J. Physiol.*, 1950, 160, 125.
⁴ Delorme, E. J., *Lancet*, 1952, 2, 914.
⁵ Laborit, H., Huguenard, P., and Alluaume, R., *Presse méd.*, 1952, 60, 206.
⁶ Swan, H., Zeavin, I., Blount, S. G., Jnr., and Virtue, R. W., *J. Amer. med. Ass.*, 1953, 153, 1081.

Another recent paper on the use of hypothermia comes from Swan and his colleagues⁶ in Denver. Their series comprised fifteen patients, mostly children, who had undergone cardiac operations while they were in a state of hypothermia, with body temperatures ranging from 21.5° C. to 26° C. Hypothermia was induced during anaesthesia (thiopentone—cyclopropane—ether) by immersing the patient in iced water. At operation the chest was opened and in thirteen cases the circulation was stopped for periods varying from 2 to 8½ minutes by clamping the venae cavae, the aorta, and the pulmonary artery. The heart or pulmonary artery was then opened and the operation performed under direct vision. By this method four cases of atrioseptal defect and nine cases of pulmonary valvular stenosis were repaired, with only one fatality. The authors claim to have made great progress in the prevention of two serious complications of operations on the open heart under hypothermia—namely, ventricular fibrillation, which is combated by the use of an injection of a solution of 0.5 mEq potassium in 2 ml., and coronary air embolism, which is prevented by complete immersion of the heart in saline at the time of the closure of the cardiectomy.

Such results from the use of hypothermia in cardiac surgery are the most encouraging that have yet been published. But knowledge of this subject is still not sufficiently advanced to justify the use of deep hypothermia in general surgery. Great caution must be used in the selection of cases, and one hazardous procedure, induced hypotension, should not automatically justify a further hazardous procedure, hypothermia. The method of lowering the body temperature may not be of great importance: further comparative studies between the usual anaesthetic techniques and the "lytic cocktail" in conjunction with physical methods of inducing hypothermia will be needed before the matter can finally be settled.

B.C.G. IN SCHOOLS

To many it must seem strange that official sanction has now been given¹ for the B.C.G. vaccination of older schoolchildren before the completion of an official trial designed to determine how useful such a scheme would be. But to appreciate the reasons for this development it is necessary to probe a little more deeply. In 1949 the Ministry of Health and the Department of Health for Scotland authorized chest physicians and others to use B.C.G. in tuberculin-negative persons in contact with tuberculosis, especially home contacts, hospital nurses, and medical students.² This

limitation was placed because out of the vast schemes of vaccination abroad the only cogent scientific evidence that seemed applicable to the British scene was of its value in those peculiarly exposed to the disease, in whom it reduced the incidence at least of primary and early post-primary tuberculosis.^{3,4} This first scheme has been working well, though in some areas, even now, the numbers vaccinated fall short of those that qualify. However, important questions on the true value of mass vaccination remained unanswered. Although there was no indication for vaccinating all tuberculin-negative persons, did any section of the population, not individually known to be in contact with cases of the disease, merit consideration? What degree of protection would be expected under ordinary conditions of life in an industrial community with a comparatively low and falling mortality, moderate morbidity, and fairly high living standards? How much emphasis relative to other antituberculosis measures should the authorities place on mass vaccination in the general campaign? Of all sections, children about to leave school and enter the industrial world seemed to call for attention. No adequate statistically controlled trial of B.C.G. (including random and not voluntary selection of persons to be vaccinated or left unvaccinated, and specific planning in advance rather than analysis in retrospect) had been made anywhere on such a group, and the desirability of remedying this deficiency had been repeatedly urged.⁵ Only two countries—Britain and the U.S.A.—had the resources for a trial and were in the advantageous (or shameful, according to the point of view) position of not already having established widespread B.C.G. vaccination; if not seized, the opportunity would be lost.

Accordingly the Medical Research Council set up a Tuberculosis Vaccines Clinical Trials Committee under the chairmanship of Dr. P. D'Arcy Hart and with Ministry of Health representation. The committee planned a large-scale controlled trial both of B.C.G. and of vole bacillus vaccine (Wells) in secondary modern school leavers in the Home Counties and in and around Birmingham and Manchester, and the work was put in the hands of the Council's Tuberculosis Research Unit. Apart from discreet

¹ Ministry of Health Circular 22/53. See *British Medical Journal*, Nov. 14 1953, p. 1111.

² Ministry of Health Circular 72/49 and Memo. 322/B.C.G. See *British Medical Journal*, 1949, 2, 29.

³ Hyge, T. V., *Acta tuberc. scand.*, 1947, 21, 1.

⁴ Heimbeck, J., *Tubercle (Lond.)*, 1948, 29, 84.

⁵ *British Medical Journal*, 1949, 2, 1278; Aronson, J. D., and Palmer, C. E., *Publ. Hlth. R p. (Wash.)*, 1946, 61, 802; *Wld Hlth Org. techn. Rep. Ser.*, 1950, No. 7; and *Dis. Chest*, 1951, 19, 110.

⁶ Pollock, T. M., *Bull. Nat. Ass. Prev. Tuberc.*, 1953, 16, 2.

⁷ Palmer, C. E., and Shaw, L. W., *Amer. Rev. Tuberc.*, 1953, 68, 462.

⁸ Dahlström, G., and Difs, H., *Acta tuberc. scand.*, 1951, 25, Suppl. 27.

⁹ Aronson, J. D., and Aronson, C. F., *J. Amer. med. Ass.*, 1952, 149, 334.

¹⁰ *British Medical Journal*, 1952, 1, 147.

¹¹ Stein, S. C., and Aronson, J. D., *Amer. Rev. Tuberc.*, 1953, 68, 695.

¹² Dahlström, G., *Acta tuberc. scand.*, 1953, Suppl. 32.

¹³ Ministry of Health Memo. 324/B.C.G.

and welcome information⁶ that this research scheme started towards the end of 1950, that over 50,000 young people enrolled between then and the end of 1952, and that its machinery is running smoothly, we are unlikely to hear anything definite from this committee for several years. This is as it should be, since premature assessment of results of any statistical investigation of a protective in tuberculosis might be misleading. A controlled study of B.C.G. vaccination in schoolchildren and others on rather different lines had been initiated by the U.S. Public Health Service in 1947.⁷

Pressure to introduce B.C.G. vaccination in this country as a routine measure for all school leavers has not been lacking in the meantime. Some tuberculosis specialists and paediatricians argued that, even though the M.R.C. investigation was expected to give a quantitative assessment of the true value of the vaccine in present-day circumstances in Britain, the evidence from abroad justified this further action being taken forthwith. The reasoning of these advocates followed two lines: first, since contacts were already offered the vaccine here on the basis of acceptable evidence of efficacy, school leavers who were about to be exposed, in the mass, to an increased risk of contact with the disease might, by extrapolation, be expected to derive at least some benefit; secondly, a few of the recent mass vaccination studies abroad, comprising follow-up of unvaccinated along with vaccinated groups, are regarded as highly suggestive or more,^{8,9} shortcomings¹⁰ and differences in milieu notwithstanding. Admittedly a scheme in which every tuberculin-negative child in the appropriate age group was offered the vaccine could give no information on the latter's efficacy in the succeeding years unless the attack rate of tuberculosis proved to be nil—which could not be expected.^{11,12}

Impressed by these lines of argument as representing a reasonable viewpoint—though not the only one—the Ministry of Health has now¹ offered all local health authorities in England and Wales additional supplies of B.C.G. should they wish to extend its use to children approaching their 14th birthday, while continuing the scheme of vaccination of contacts. At the same time a memorandum¹³ giving a balanced review of the status of B.C.G. has been provided to assist the local authorities, but, wisely, no attempt is made to influence their individual decisions whether to take action or not. Those authorities who adhere closely to the favourable views already mentioned will undoubtedly go ahead, strengthened in their decision by the knowledge that the vaccine is harmless and that local and glandular complications are not troublesome in adolescents. If they do so, the Ministry urges that there should be no interference with

the current M.R.C. investigation proceeding in certain areas (this should not happen, since the intake of children has been completed and the volunteers have left school). Other authorities will be more cautious, believing that there is no need for urgency in an improving tuberculosis situation; that it is better to wait two or three years for the results of the M.R.C. investigation concerned with this very problem; and that the exposure to which these young people will be subjected in their various occupations will, on the average, be so much more dilute than those of individual contacts covered by the first national scheme that the consequent protective benefit may be quite small. These authorities will in turn be strengthened in their decision by the preliminary report of the U.S. Public Health Service's controlled trial,⁷ which states that a large proportion of the tuberculosis appearing in the first few years of their scheme was in the group initially tuberculin-positive and therefore not candidates for B.C.G.; so far the amount of tuberculosis occurring in the initial tuberculin-negative persons, whether vaccinated or not, is still too small to show if B.C.G. has been effective. This report concludes that at present the American studies "do not indicate that tuberculosis in this country would be more effectively controlled by adding mass vaccination programs." The decision facing each local health authority is thus far from easy, since the issue is unclear. It is known that some have already decided to take part in the new scheme, and others to postpone extension. Either course is probably in accord with the discharge of their responsibilities to the community.

INFECTION AND POLIOMYELITIS

At the World Health Organization conference on poliomyelitis held at Rome in September there was much discussion about the spread of infection and its prevention. The general public is naturally much concerned about this, and it is doubtful whether the medical profession, concentrating on treatment, has in Britain given enough attention to what is known of the infectivity of the disease and to preventing its spread. The belief is commonly held that, in an epidemic of poliomyelitis, virus is widely and indiscriminately spread throughout the population, and that a clinical case is a rare incident in an outbreak of mass infection. This view has been contradicted again and again by careful studies of infected communities, and there is no virological or epidemiological evidence to support it. On the contrary, these studies invariably show that the virus is spread by close contact and that the path of its spread, when it can be traced, is quite narrow. Adamson,¹

describing a winter epidemic among Eskimos in Hudson's Bay territory, showed how the spread of infection from one settlement to another followed the movement of man across hundreds of miles of frozen snow. The nature of the country and the habits of the people sharpened the lines of this epidemic, but the same pattern can be traced in all types of communities. Silverthorne² described the investigation of outbreaks in Dufferin County, Ontario, a rural area of over 500 square miles with 14,000 inhabitants, most of them living in large farms and villages. When poliomyelitis broke out, a team of experts moved in and studied the problem by carefully inquiring into the habits and movements of all contacts. Out of 28 cases, close contact with a previous case was proved in 17; moreover, of the 28 cases, only 12 were frank clinical cases; the other 16 suffered from the "minor illness" and would probably not normally have been recognized as cases of poliomyelitis. Of 37 cases described by Casey,³ 29 were paralytic, and all of them followed short visits to the vicinity of a previous case. Examples quoted so far refer to rural areas, but Casey and others⁴ have described similar investigations in the centre of Chicago. When a case was reported, a block of dwellings round the patient was defined and all residents aged under 25 came under survey; their habits at work and play, especially for the three days before and after the onset of illness in the case, were scrutinized. For control, another block, at least half a mile away, was chosen for a similar survey. This method was called "intensive neighbourhood study." Among 66 persons regarded as contacts, 37 fell ill, 24 diagnosable as poliomyelitis; among 109 non-contacts in the block, 4 fell ill; and among 115 non-contacts in the control block, 5 fell ill. The contact was always a close one, usually in the family or among playmates. Pearson and others⁵ studied household infection: in 127 households where there was no known contact with poliomyelitis, virus was isolated from 2 (1.6%); in 45 households with non-familial contact, virus was present in 8 (18%); and in 8 households where there was a paralytic case it was found in 6 (75%).

We must regard the family as an infected unit. The clinical case, although quite possibly a more efficient spreader of infection, is not a solitary victim of the virus: it can usually be shown by virus studies that all or most of the other members of the family are infected almost simultaneously.⁶ How the family is first infected and how the virus spreads

from one person to another are problems still not solved. The type of contact necessary is evidently the type of association that occurs in families, among playmates, at children's parties, and in neighbourly visits. Faecal and respiratory spread are both possible, and hands may be infected by both faecal and respiratory organisms.

Though the exact mechanism of transfer is still uncertain, it is clear that people inside the family infect people outside. Most of these people remain well though infectious, but some become ill with headache, sore throat, nausea, muscular pains, irritability, and malaise. These are the symptoms of the minor illness of poliomyelitis; they are not clear-cut, but, in a known contact, clear enough to suggest infection. How often these illnesses occur can be determined only by close inquiry, and we have mentioned above that Silverthorne reported 16 minor illnesses out of 28 cases. A problem worth looking into is how many cases admitted to hospitals during epidemics of poliomyelitis and finally diagnosed as "constipation and headache," "myalgia," and so on are in fact suffering from this poliomyelitis minor illness.

With all this knowledge, can anything be done to block the line of infection? Quarantine of contacts is the obvious attack, and Agerholm has vigorously pleaded for it.⁷ But, if it is to be effective in this disease, all intimate contact with other people must cease. If children are excluded from school, they must also be excluded from playgrounds, sandpits, parks, alleys, and courtyards. If adults must not go to work, neither must they visit cafés, pubs, or cinemas. Can such restrictions really be enforced? In city life it is most unlikely; in the country similar restrictions are already accepted in outbreaks of foot-and-mouth disease. If compulsion is impracticable, persuasion and public opinion might be more effective. When a case occurs in a family, the parents should be told the facts and asked to co-operate. A simple illustrated pamphlet might help to secure this. During epidemics the public should be informed by press and poster of the dangers of contact infection. It is unlikely that intelligent parents would run risks. As Agerholm points out,⁷ in 1950 people cancelled visits to the Isle of Wight of their own free will. If anything is to be achieved, public health policy must be based on facts: the parents of a paralysed child should no more be heard to say that "the health people have been round and disinfected everything." A good deal of what passes for contact supervision in the common infectious diseases has become a matter of dull routine, delegated to health visitors and sanitary inspectors. In poliomyelitis there is need for expert and inspired inquiry.

¹ Adamson, J. D., *Canad. med. Ass. J.*, 1949, 61, 339.

² Silverthorne, N., *ibid.*, 1949, 61, 241.

³ Casey, A. E., *J. Amer. med. Ass.*, 1942, 120, 805.

⁴ — et al., *ibid.*, 1945, 129, 1141.

⁵ Pearson, H. E., et al., *Amer. J. Hyg.*, 1945, 41, 188.

⁶ Zintek, A. R., *ibid.*, 1947, 46, 248.

⁷ Agerholm, Margaret, *Lancet*, 1953, 2, 287.

A NEW SYNDROME

The work of a pneumoconiosis medical panel might be thought at first to be restricted to routine duties in a narrow specialty and unlikely to afford opportunities for original observation, but it was in the course of his routine duties in assessing cases of pneumoconiosis for industrial injury benefit that Dr. A. Caplan¹ noticed a high incidence of rheumatoid arthritis associated with massive fibrosis in cases of pneumoconiosis. Of 51 cases with rheumatoid arthritis 90% showed massive fibrosis, whereas in 14,000 other cases of pneumoconiosis only 30% had massive fibrosis. On assembling the radiographs of the 51 cases Caplan further noticed that in a quarter of them the pulmonary shadows were of a peculiar and uncommon form. Instead of the usual gradual enlargement of irregular fluffy opacities to form large massive shadows, in these cases multiple, well-defined, round opacities 0.5-5 cm. in diameter appear relatively quickly, usually in the periphery of the lung fields on both sides. The background of simple pneumoconiosis is also less well marked than is usual in progressive massive fibrosis (P.M.F.). After they have appeared, these round shadows usually remain stationary, but sometimes enlarge slightly, may cavitate, and in long-standing cases show some signs of shrinkage. In three fatal cases tubercle bacilli were recovered from areas of massive fibrosis, and Caplan suggested that the joint changes might be a form of "tuberculous rheumatism."

Further epidemiological study was required to establish the validity of this special syndrome and to discover the real association between P.M.F. and rheumatoid arthritis, for the apparent association noted in compensation cases might have been due to a greater likelihood of men with both arthritis and P.M.F. to apply for disablement benefit than men with either alone. Fortunately an appropriate epidemiological instrument was immediately available for such a study, the results of which we publish this week at page 1231. In 1951 Dr. A. L. Cochrane, of the Medical Research Council Pneumoconiosis Research Unit, had x-rayed 95% of all the miners and ex-miners living in the Rhondda Fach.² In 896 of these men a radiographic diagnosis of P.M.F. or clinically significant tuberculosis had been made. From the films of these men Caplan selected 20 as showing the particular appearance which he thought would be associated with rheumatoid arthritis. A random sample (stratified for age) was taken from the films he had rejected, and similar control groups of cases with simple pneumoconiosis or normal films were also chosen. A physician unaware of the radiological diagnosis visited all these men at home to inquire about symptoms of arthritis. The men with a suggestive history were examined, and if necessary fully investigated to confirm the diagnosis. Of the cases selected by Caplan 11 (55%) were found to have rheumatoid arthritis, a proportion differing significantly from the 3% in the controls with P.M.F. or tuberculosis and

none in the other controls. While this epidemiological work has not fully confirmed the association between rheumatoid arthritis and ordinary P.M.F.—for the prevalence in P.M.F. was only just significantly greater than in the normal controls—it demonstrated the reality of the special syndrome described by Caplan. It seems that, given a chest radiograph of a miner which shows the characteristic "rheumatoid" appearance, a diagnosis of rheumatoid arthritis may be made with rather more than a 50% chance of being right.

Among the 20 cases with the "rheumatoid" type of opacity there was a suggestion that arthritis was associated with slightly longer dust exposure, especially to stone dust. The Middlebrook-Dubos agglutination test was positive in 8 of 18 sera tested (44%), contrasting with only 3% of 133 cases of early P.M.F. Only one patient had a positive sputum, and in one elderly man who died there was no evidence of active tuberculosis, the round lesions being histologically similar to ordinary massive fibrosis. There is thus only a suggestion that the pulmonary lesions are tuberculous: the true pathological condition can be shown only by necropsy or biopsy study of recent lesions.

There seems to be no satisfactory explanation for the association between the lung and joint changes. The latter are quite typical of rheumatoid arthritis, unlike those found in hypertrophic pulmonary osteoarthropathy and fibroma of the lung. It seems unlikely that the lung shadows represent a modification by dust of rheumatoid changes occurring in the lung, for no such changes are found in the lungs of ordinary cases of rheumatoid arthritis.³ However, rheumatologists do occasionally observe extensive pulmonary fibrosis in cases of rheumatoid arthritis, more chronic than that described by Ellman and Ball,⁴ and similar lesions have been described in other collagen diseases.⁵⁻⁸ Miall and his colleagues dismiss the possibility that the arthritis is a response to the pulmonary lesions acting as a "septic focus" because of the long interval that may elapse between the onset of each, and they favour a hypothesis that a deficiency of adrenocortical hormones may underlie both the arthritis and a modified response of the lung tissues to dust and infection. Now that this syndrome has been described it will no doubt come to be noted with increasing frequency. Unpublished cases have already been observed in men exposed to other dusts than coal. Miall and his colleagues have provided us with a striking example of the value of epidemiological study, on a defined and unbiased population, in revealing the existence of a syndrome first suspected from clinical observation. Their account, in an appendix, of the observer error encountered in subjective methods of assessment, both of radiographs and joints, should encourage other clinicians to follow their example and test their own abilities with the same critical courage.

SYNTHETIC OXYTOCIN

The first synthesis of a new group of biologically important substances calls for recognition by doctors as well as chemists. That of oxytocin, the principal uterine contracting and milk-ejecting hormone, has lately been

reported by du Vigneaud and others¹ of the Department of Biochemistry, Cornell University Medical College. This is the first polypeptide hormone to be synthesized. But from a footnote to an accompanying publication² it appears that a similar success has probably been achieved also in the case of lysine vasopressin. The latter is a closely related hormone, and a synthetic polypeptide synthesized by similar methods to those used in the synthesis of oxytocin has been found to possess pressor and antidiuretic activity. Oxytocin can be thought of as a cyclic polypeptide and side-chain, with a cystine residue as its key component. Four other amino-acid residues are joined in a closed ring through cystine; they are, in order, tyrosine, isoleucine, and glutamic and aspartic acids (as amides). In a side-chain, attached to one arm of the cystine residue, are proline, leucine, and glycine (as amide). The deduction of this structure by chemical reasoning was perhaps the most important step in du Vigneaud's achievement. Its synthesis, with a first yield of 360 mg., is no mean accomplishment in organic chemistry.

The biological activity of the synthetic preparation has been confirmed, in respect of uterine contraction on an isolated rat uterus, and in respect of milk ejection on a human subject. The total activity, assayed by the chicken-depressor method, is 29,000 units, and the activity per unit weight has been compared with purified preparations of the natural hormone. Although chemical identity is not specifically claimed by du Vigneaud and his colleagues, the evidence for it is thus strong. The case of vasopressin is of further interest from the apparent existence of an inter-species difference in composition. From earlier work on purified natural preparations of hog (leucine) and beef (arginine) vasopressin it had been concluded these hormones differ from oxytocin only in the replacement of the leucine and isoleucine residues of the latter, in lysine vasopressin by phenylalanine and lysine, and in arginine vasopressin by phenylalanine and arginine. The difference between hog vasopressin and beef vasopressin is thus confined to a single residue—lysine in the one, and arginine in the other. Lysine vasopressin has been synthetically prepared, and shown to possess biological activity. A fuller report on this work will be awaited with interest, as also will the confirmation by synthesis of the inter-species difference. While there is usually a considerable gap between laboratory synthesis and practical production—and du Vigneaud's synthesis of oxytocin is laborious—the relatively good yield which he has obtained encourages the hope that supplies of synthetic hormone will eventually become available.

A FORGOTTEN CHAPTER

The new College of General Practitioners in its first annual report refers to a piece of forgotten history—the abortive attempt to found such a college just over 100 years ago. One statement is made, however, which, though literally accurate, may be misunderstood. In

¹ du Vigneaud, V., Ressler, Charlotte, Swan, J. M., Roberts, C. W., Katsoyannis, P. G., and Gordon, S., *J. Amer. chem. Soc.*, 1953, 75, 4879.
² du Vigneaud, V., Lawler, H. Claire, and Popenoe, E. A., *ibid.*, 1953, 75, 4880.

describing the movement to set up the college in the 'forties of the last century the writer says: "The British Medical Association showed itself in favour. A meeting held on November 26, 1844 (Dr. Webster, President, in the chair), resolved," etc. Actually Dr. Webster was never President of the British Medical Association as we now know it, but of an earlier, short-lived, and Ishmaelite body which had assumed that title in 1836, claiming to represent the medical practitioners of the United Kingdom. In 1844 the *Medical Times* reported the British Medical Association as having "met in the person of Dr. Webster on September 28. The secretary was absent, and the resolutions appear to have been moved by the president, seconded by the president, put to the vote by the president, and carried by the president. He was the whole meeting." It was not until 1856, ten years after the first British Medical Association had disappeared without trace, that the body which had hitherto been known as the Provincial Medical and Surgical Association became the British Medical Association.

Nevertheless, Dr. George Webster, a zealous medical reformer of his time, took a principal role in formulating the demand for a charter of incorporation for general practitioners. He was the principal figure at a meeting at Hanover Square on March 14, 1845, when "there were about 1,200 gentlemen present, including the most respectable general practitioners in all parts of London." From a letter by a "village surgeon" who attended the meeting we learn that there was also "a fair sprinkling of country practitioners, as many as, considering the sickly season of the year, and the constantly existing difficulty of locomotion inherent in our calling, could reasonably be expected." An attendance of 1,200 would be considered a bumper one in these days, even in times of medico-political crisis, notwithstanding a less sickly season and better means of locomotion. But, like many other events of this kind, it was only a firework display. Blunders were made in the election of the permanent committee, the draft charter of incorporation was sent to the Home Secretary without being submitted to another general meeting, the confidence of the profession was largely forfeited, and the enthusiasm petered out. The Royal Colleges, too, were not pleased at the use of the words "medicine" and "surgery" in the proposed title of the college. The Home Secretary at that time was the rather ineffective Sir James Graham, who had drafted no fewer than four Bills for the regulation of medical practice. In the last of these he introduced a proposal for a college of general practitioners, but it was a meaningless affair which would have been dependent upon the Royal Colleges.

The present movement has proved much more successful than that of 100 years ago, and the new College, which gained a membership of more than 2,000 before it had been in existence for six months, has been established with good will on all sides of the profession. It is now consolidating itself, building up regional faculties, and preparing to play a major part in the academic field both for general practice and for general practitioners.

¹ Caplan, A., *Thorax*, 1953, 8, 29.

² Cochrane, A. L., *British Medical Journal*, 1952, 2, 843.

³ Baggenstoss, A. H., and Rosenberg, E. F., *Arch. Path.*, 1943, 35, 503.

⁴ Ellman, P., and Ball, R. E., *British Medical Journal*, 1948, 2, 816.

⁵ Shuford, W. H., *et al.*, *Arch. intern. Med.*, 1953, 92, 85.

⁶ Rakov, H. L., and Taylor, J. S., *ibid.*, 1942, 70, 88.

⁷ Foldes, J., *Amer. J. clin. Path.*, 1946, 16, 160.

⁸ Baggenstoss, A. H., *Proc. Mayo Clin.*, 1952, 27, 412.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

INFECTED URINE

BY

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One of the commonest reasons for suspecting a urinary infection is because the urine appears turbid, but this may, of course, be due to other factors than bacterial infection.

It is generally possible to decide fairly quickly whether or not turbidity is due to infection or to other causes. A turbidity which disappears on warming is due to urates only, but if the turbidity remains after the test-tube has been warmed then another sample should be taken and a few drops of acetic acid added, because a cloudiness which clears up with acetic acid only is due simply to phosphates. If the turbidity persists both after warming and after acidifying with acetic acid then it is probably due to pus, to blood, or to bacteria. Urine that is "bell clear" in appearance is very seldom infected.

Microscopical Evidence of Infection

The presence of infection is confirmed by the detection of pus or bacteria in the urine. An infected urine generally contains pus cells, and microscopical examination is the only way of identifying these. Chemical tests for pus are so insensitive and open to so many fallacies that they are hardly worth performing.

The simplest and quickest way of carrying out the microscope test is to take a drop of the urine and run it into the chamber of a Fuchs-Rosenthal slide, such as is used for the examination of cerebrospinal fluid. This differs from the ordinary blood-count slide in that it is ruled to enclose 16 mm.² and has a depth of 0.2 mm., whereas the haemocytometer slide is only 0.1 mm. in depth.

If a drop of urine is pipetted into such a C.S.F.-counting chamber and allowed to settle it can be examined in a few moments, and microscopical examination will show at once whether or not the urine contains pus or blood. One great advantage of this method is that no centrifuging is necessary. Another is that one can decide at once whether the turbidity of the urine is due to pus, blood, bacteria, or crystals, and, if pus is present, roughly how much there is.

The more usual method of carrying out a microscopical examination is first to centrifuge the urine, then to place a drop of the deposit on an ordinary microscope slide, cover this with a cover-glass, and examine with the sixth objective. This is certainly the best method, but if no centrifuge is available the urine may be allowed to stand in a conical vessel for a few hours until a deposit has formed. After decantation of the supernatant urine a drop of the deposit is collected in a pipette and examined on a slide beneath a cover-glass.

Before passing on to bacteriological tests it is worth recalling that sometimes tests for pyuria may give an indication of the location of the infection in the urinary tract. The two-glass test is often sufficient for deciding whether pus comes from the urethra or the bladder. To perform this test the patient is asked to pass urine into two glasses. Pus present in the first glass is assumed to be derived from the urethra, and that in the second from the bladder or kidneys.

In suspected pyelitis or pyelonephritis and in some cases of renal tuberculosis it may be necessary to examine specimens of urine collected separately from the bladder and each kidney. A unilateral tuberculous lesion of the kidney gives rise to pyuria from the affected kidney, whilst the

urine from the opposite kidney and the bladder is clear. Uncomplicated cystitis shows the presence of pus in the bladder urine, but the urine from each kidney is free from pus and sterile. When large quantities of pus are found in urine this is almost always due to cystitis. Pyelitis, pyelonephritis, prostatitis, and urethritis usually give rise only to a relatively slight degree of pyuria.

Collection of Specimens for Bacteriological Tests

Specimens of urine for bacteriological examination need to be collected with special care and to be examined as soon as possible. Catheterization is not always necessary. For male patients a mid-stream specimen collected after cleansing the urethral orifice is generally quite satisfactory for bacteriological tests. Catheterization is more often required with female patients; in fact, if urine from women is found to contain a few pus cells and bacteria a catheter specimen is generally necessary in order to decide whether or not infection is present. Naturally catheterization should be avoided if possible, and it is worth pointing out that with reasonable care a clean specimen can often be obtained from a woman patient. A preliminary examination of this may be enough to decide whether or not catheterization will ultimately be necessary. The collection of a "clean" specimen of urine from infants or young children is a task which may tax the ingenuity and resources of all concerned.

Microscopical Examination of Stained Films

The next step is the examination of stained films from the centrifuged deposit, and for the preparation of these a drop of the deposit is spread evenly over a microscope slide and allowed to dry. The film is then fixed with heat by passing it three times through a flame. All urinary deposits should be stained with Gram's method as a routine. The great advantage of this stain is that it distinguishes between the staphylococci, which are Gram-positive and appear purple in the stained film, and gonococci, which are Gram-negative and stain red. It is useful also in distinguishing the common Gram-positive diphtheroids and Döderlein's bacilli from Gram-negative bacilli such as *Bact. coli*, etc.

Whether or not any other stains should be used depends on the nature of the case. If there is no reason to suspect tuberculosis or other unusual infection, it is not necessary as a rule to stain more films. On the other hand, if the Gram stain shows the presence of pus cells but no bacteria, or if tuberculosis is suspected, the films should be stained by one of the methods used for acid-fast bacteria. Tubercle bacilli are rarely found in large numbers in the urine, and it may take several minutes' search to find them in a stained film, but bacteria like staphylococci, *Bact. coli*, and other coliform organisms are present in such large numbers that they can be recognized by one glance at the stained film.

Bact. Coli Infections

Infection with *Bact. coli* is a common finding. It may give rise to infections of the kidney, bladder, prostate, or epididymis, each of which has its own distinctive symptomatology. When the urine is found to be infected with *Bact. coli* the next step is to discover which part of the urinary tract is affected. This may generally be decided from the clinical history and the results of physical examination, but in exceptional cases it can be determined only after the collection of urine from the bladder and each kidney separately.

Meanwhile the problem remains, why has the infection occurred? *Bact. coli* is a relatively harmless microbial species and rarely causes trouble in organs which are functioning normally, so it becomes the object of clinical examination not only to decide where the infection is located but also why this region is affected. Many *Bact. coli* infections of the urinary tract are unlikely to be permanently cured until some underlying structural or functional defect has first been removed. Special predisposing causes are peculiar to different periods of life, such as infancy, pregnancy, or the years when prostatic obstruction is apt to set in.

Urine infected with *Bact. coli* is hazy when passed and has an opalescent appearance. If the urine glass or bottle is held up to the light and rotated to circulate the urine, the haziness appears like a drifting mist, a very characteristic feature. This is caused by the innumerable bacteria suspended in the urine. The haziness of the urine varies in intensity in different samples, being most evident in the early-morning urine. Later in the day the urine may be almost clear. The hazy opalescent appearance is only found in samples of urine almost free from pus. If much pus or blood is also present it will cause a turbidity which conceals the characteristic appearance of a simple bacilluria. In some cases of *Bact. coli* infection the urine has a peculiar fishy odour, but this is not invariably characteristic. The faculty of smell is rarely used as an aid to diagnosis in any branch of medicine nowadays, and without being fastidious most of us would agree with the views of the seventeenth-century physician who wrote: "It is too base and sometimes dangerous for the physician to put his nose to the urine to discern the stench thereof."

Proteus and Pyocyanus Infections

Urine infected with proteus has the same general appearance as in *Bact. coli* infections but may also contain a small quantity of viscid ropy mucus in which the pus cells are suspended. The reaction is usually alkaline, and triple phosphate crystals and amorphous phosphates are commonly found in the deposit.

Infections with proteus may occur either in the bladder or in the kidney and are generally of a more severe character than *Bact. coli* infections, and more difficult to cure. *Ps. pyocyanus* is found in the urine under similar circumstances to *B. proteus*. If pus is present in large quantity this may develop a bluish green colour on standing.

Staphylococcal and Streptococcal Infections

The presence of staphylococci in urine may be the result of chance contamination in collection, and it is common to find these and other bacteria in any stale specimen which has begun to undergo ammoniacal fermentation. In these circumstances, of course, the presence of staphylococci is of no pathological significance; but if they are recovered from urine which has been carefully collected and examined without delay the finding of these organisms is an important observation. Staphylococcal infections may occur in the kidney, bladder, prostate, urethra, and epididymis. They may be associated with calculous disease and provide evidence of both the existence and the nature of a stone. The examination of stained films from the centrifuged deposit of the urine is a test which should never be omitted in calculous disease. In stones associated with staphylococcal infections the films may show enormous numbers of Gram-positive cocci, though the bacteriological culture plates may yield only a few colonies. When the urine is infected with staphylococci or proteus, and is strongly alkaline in reaction, further tests should be carried out to see whether or not the infecting bacteria ferment urea. Most strains of staphylococci and proteus ferment urea and thus render the urine alkaline, leading to the precipitation of phosphates and calcium carbonate.

Streptococcal urinary infections are rare, but it is fairly common to find streptococci in the urine in mixed infections, especially in severe urinary sepsis associated with carcinoma of the bladder or vesico-colic fistula. Pure streptococcal

infections of the urine may be found in cases of pyaemic abscess of the kidney and chronic urethritis and prostatitis.

Gonococcal Infections

Three laboratory tests may be used in the diagnosis of gonorrhoea—namely, microscopical examination of films, bacteriological examination of cultures for gonococci, and the gonococcal complement-fixation test. The film method is usually sufficient for the recognition of acute gonorrhoea, but in chronic infections it is best to make use of both films and cultures. This is especially important when the finding of Gram-negative diplococci in films is an unexpected observation, and also in tests for cure in chronic gonorrhoea. In all medico-legal cases all three methods of examination should be employed. These tests will be discussed in more detail in a later article in this series.

Urinary Tuberculosis

Three methods are available for the detection of tubercle bacilli in urine: stained films, cultures, and animal inoculation.

The film method is the easiest and requires least apparatus. It has the advantage that it takes only a few minutes to carry out, and so a report can be given without delay. The tubercle bacillus is the only pathogenic acid-fast bacillus likely to be present in the urine, and with proper precautions it is unlikely that a trained observer will report a false positive by mistaking one of the non-pathogenic acid-fast bacilli for the tubercle bacillus. The stained film is therefore the regular routine method of examination. If acid-fast bacilli having the typical morphological characters and staining reactions of tubercle bacilli are found in stained films in association with red blood cells and pus, then, as a general rule, no further tests are necessary, and the diagnosis of tuberculosis may be considered to be established. If acid-fast bacilli are found which are not quite typical in microscopical appearances, then it is best to reserve a final opinion until the results of the cultures are available, or until virulence tests have been undertaken. On the other hand, when acid-fast bacilli are found in a urinary deposit unaccompanied by blood cells or pus then it is always necessary to proceed to confirmatory tests before accepting these acid-fast bacteria as genuine tubercle bacilli.

Culture tests for tubercle bacilli are not difficult to carry out and are a routine procedure in hospital laboratories. They are useful for the further study of acid-fast bacilli of uncertain character found in films. They should also be undertaken in cases in which there is a possibility of a tuberculous infection although acid-fast bacilli have not been found in the stained films. In a small percentage of cases of urinary tuberculosis tubercle bacilli may be obtained from cultures when they could not be found by examination of films. This is because the pathologist can plant out on the culture media a much larger volume of urine than could be searched in a film; therefore, when tubercle bacilli are relatively scarce it is only to be expected that some cultures may be positive when the films have been negative.

Guinea-pig inoculation is the final court of appeal in tuberculosis; but it should not be resorted to unless other methods of diagnosis have failed. It is an expensive test, it takes at least three to six weeks to complete, and it involves an experiment on a living animal which, naturally, should only be undertaken with reluctance. Experience has shown that the guinea-pig inoculation test very rarely reveals the presence of tubercle bacilli which could not have been discovered by films or by cultures. In fact the culture method is probably a more delicate test than guinea-pig inoculation, especially when large quantities of the centrifuged deposit of urine are spread over several culture tubes. By this distribution of the centrifuged deposit it is possible to submit for examination a larger volume of urine than can be injected into one guinea-pig. However, there are certainly some occasions when animal-inoculation tests are indispensable—for example, in identifying suspicious acid-

fast bacilli recovered by culture, and in the examination of material which is limited in quantity and obtained with special difficulty, such as urine collected by catheterization of the ureters.

Sensitivity Tests

The range of antibiotics is steadily extending, consequently there is an increasing demand on the services of the laboratory for carrying out sensitivity tests in cases of urinary infection. It is well established that most staphylococci and streptococci recovered from urinary infections are sensitive to penicillin whereas *Bact. coli* and other coliform organisms are generally insensitive to penicillin, though often sensitive to chloramphenicol, aureomycin, or oxytetracycline. If the urine is infected with *B. proteus* or *Ps. pyocyanea* response to oxytetracycline or streptomycin may be expected in some cases. The laboratory control of chemotherapy will be discussed more fully later in this series.

Next article on Clinical Pathology.—"Tests of Renal Function," by Dr. R. I. S. Bayliss.

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

THE LIBRARY OF THE ROYAL SOCIETY OF MEDICINE

An extension to the library of the Royal Society of Medicine is being opened this week, on Friday, December 4, by the Marquess of Salisbury. The new library, which is to be called the Wellcome Research Library, has been provided through the generosity of the Wellcome Trustees. To celebrate this occasion we have pleasure in printing below an authoritative account by a special correspondent of the origin and growth of the library of the Royal Society of Medicine.

The Royal Society of Medicine was founded in 1907 following the amalgamation of a number of specialist medical societies and the Royal Medical and Chirurgical Society of London. Some of the special societies had built up collections of books, but the chief foundation of the library of the Royal Society of Medicine was the library of the Royal Medical and Chirurgical Society of London. It is impossible to neglect the history of the library of the R.M.C.S. in any account of the library of the R.S.M., and even to-day some of the library regulations of the parent society remain unchanged.

Foundation of the R.M.C.S. Library

According to the first minute of the meeting which led to the foundation, in 1805, of the Medical and Chirurgical Society of London it was "Resolved unanimously that a society comprehending the several branches of the medical profession be established in London, for the purpose of conversations on professional subjects, for the reception of communications and for the formation of a library." When the first secretary, John Yelloly, reported on "the dignified and important objects for which this society has been established" he placed high among them "the collection of an extensive and select professional library." A library committee was set up in 1806, when £100 was provided to buy books. Presentations were received, and by 1808 the library had about 500 volumes.

The First Honorary Librarian

In 1810 the Society moved from its first house at 2, Verulam Buildings, to 3, Lincoln's Inn Fields, which was

shared with the Geological Society. The growth of the library was not forgotten at this time, for the Medical and Chirurgical Society obtained the right to erect bookcases in the meeting-room. Some members had already shown an interest in "arranging the library," and in 1812 Bateman was appointed honorary librarian; he thought highly enough of his office to mention it on the title-page of his *Delineations of Cutaneous Diseases* (London, 1817). James Atkinson in his *Medical Bibliography* has left this description of the first honorary librarian: "He was then [i.e., a year before Bateman's death] a spare, oblique, marasmoid figure, labouring much under disease, and a cornucopia of whims and self-possessions or conceits; but of a very irritable kind. He then gave me the idea that he never could have been the quiet discreet registrar of disease, which bears so much semblance in his works, and I confess that from the state of exuvium in which I saw him, I should have set him down for anything but a clever man—I mean, in science, as an *homo saturatim inbutus*. We must recollect, however, that when any man is unwell, it is not the time to take his portrait." Soon after his appointment, Bateman, in company with Yelloly, made a book-buying journey to Paris, and the library benefited greatly from this.

The first printed catalogue was issued in 1816. Two years later a supplement appeared and a library copy formed from these and kept up to date by the insertion of new entries remained in use for many years. This same period saw the establishment of practices which are still followed to-day. In 1817 the number of volumes which a member might borrow was raised to eight, though new books and journals less than a month old could not be borrowed. In 1818, with the appointment of Samuel Cooper to assist Bateman, the custom was established of entrusting the supervision of the library to two honorary librarians. A third point of present-day practice also dates from this time. It was ordered in 1816 that a written request from the member concerned must be presented by anyone claiming to be borrowing books on his behalf; this was after "a person unknown had taken out books in Dr. Goode's name."

In 1819 the Society moved to 30, Lincoln's Inn Fields, and in 1820 to number 57, where it remained for the next 14 years. There is no known record of the effect on the library of these repeated removals, but the occurrence of unusually high binding costs at this time suggests that the books suffered physical damage.

In 1822 the Council ordered that "all new English publications be sent in as soon as published, subject to their being returned to the booksellers, if presented by the authors to the Society." This practice was modified in 1826, when the Council ordered that books laid before it for approval should have been seen by one of the librarians and "sent forward with his sanction."

For some years it seemed to have been one of the duties of the resident clerk "to deliver out the books," but in 1832 an "assistant to the librarians" was first employed, apparently solely for library duties under the supervision of the librarians.

In 1835, when the Society moved to 53, Berners Street, a reviewer in the *Lancet* of April 23 made some harsh criticism of London medical libraries in his notice of Forbes's *Medical Bibliography*. He said of the R.M.C.S. library: "It is only lately that any French journals have been added: no German or Italian, or any other continental medical journal beside the French is now received. Only a minority of modern works, and those slowly, are procured. . . . The utmost ignorance of foreign medical literature evidently prevails among the managers." A new catalogue was started in 1837, and a copy was distributed to every Fellow in 1844. By 1847 storage space was giving concern, but the deficiencies in the collections were an even greater anxiety. A committee of 21 Fellows was created to inquire into these deficiencies and to prepare lists of books for purchase. As a result, 432 books (57 English, 153 French, 175 German, 5 Italian, and 42 Latin) were bought in 1848 at a cost of £253 10s. 9d.

A Great Bibliographer

In 1855 Benjamin Robert Wheatley, one of the great bibliographers, became sub-librarian. The library held about 17,000 volumes and was growing by annual increases of 500. One of Wheatley's first tasks was to provide an index of the library's possessions. This work, containing more than 35,000 references, was ready in manuscript in 1860. It had a double value: not only did it show what the library held; it also showed obvious gaps, and efforts were made to fill them by the immediate purchase of 150 works on botany and chemistry. The average daily number of readers in the library was 12. It seems that even at this time the library recognized the need for supplementing its own resources in order to satisfy Fellows, for in 1863 comes the first mention of a subscription being placed with Kimpton's circulating library. The growing awareness of the importance of the public health and epidemiological aspects of medicine was reflected in the policy of collecting sanitary and public health reports "for their value in illustrating results of sanitary measures on death rates and for the presentation of figures not available in the reports of the Registrar-General."

In the annual address in 1868 the President commented on the addition of 519 books, and continued, "with reference to what has been said of the library, I must add that every Fellow who requires a book which is not there, ought to enter it in the recommendation book, and, in all probability, the librarians will order it at once." The collections of periodicals, too, had been greatly enriched, and in the annual report for 1870 there is a note that at the general meeting "Dr. Webster made a few remarks as to the superiority of the Society's library to any foreign library he had ever seen in relation to the completeness of its journal collection."

Increase in Accommodation

In 1871-2 a new reading-room was built, giving space for 27,000 volumes, and for the first time the Society had library accommodation which was distinct from the meeting-rooms. With the new reading-room came a rearrangement of the books which it was hoped "would render the library as noted for convenience and ease of reference as it has long been for its value and extent." In the following session (1872-3) 3,171 books were lent, and 3,156 readers used the library. A contemporary comment on the increase in the Society's expenditure said that this "was partly due to a greater number of books of importance than usual having been brought before the Library Committee, but is greatly owing to the increasing growth in the number of important new foreign journals, which are much in request by the Fellows and constantly being added to the Library tables." With the new reading-room arranged, Wheatley turned to the preparation of his great three-volume catalogue and subject index of the library. Work began in 1874 and the catalogue was published in 1879. From the 17,000 volumes of 1860 the library had now grown to 31,000.

It is possible here to make only brief mention of the growth of the periodical collection as it appears from the

catalogues of 1844, 1856, and 1879. A catalogue of 1844 has this manuscript note on a fly-leaf:

Library contains:

Journals entered as such	49
Journals entered under other heads	190
Transactions entered as such	34
Transactions entered under various heads	133

It was the practice, followed in all three catalogues, to make a distinction between "Transactions," which indicated a periodical published under the auspices of some medical or scientific society, and "Journals," which covered periodicals issued without official support from any particular society. This 1844 catalogue is prefaced by a "list of the periodical publications which are to be found on the library tables, alphabetically arranged." The list is under two headings, British and Foreign. The British periodicals numbered 13, the foreign 10. By 1879 the total number of journals and transactions thus catalogued had risen to 177.

Although nine supplements to the 1879 catalogue, covering the years 1880 to 1901, were published, no new catalogue was printed thereafter. Such works are increasingly difficult to prepare and long delays in publication made the production of an up-to-date printed catalogue virtually impossible. In common with most other medical libraries, the Society's library has come to rely on the card catalogue of its own collections and to use such international biblio-

graphical works as the Surgeon-General's *Catalogue* and the *Index Medicus* as guides to the literature. Nevertheless, in its day, Wheatley's catalogue of 1879 was a very valuable publication.

In 1881 he was given the title of resident librarian; in the next year an assistant was also employed in the library. Wheatley died in 1884. There were 93 applicants for the vacant post; the Council appointed James Bailey, of the Radcliffe, who remained for three years before moving to the Royal College of Surgeons, where he carried out a complete reorganization of the College library.

Sir John MacAlister

Bailey was followed by Mr. (later Sir) John MacAlister. His contribution to the progress of the R.M.C.S. and to the formation of the R.S.M. extended far beyond the library; yet to him, as a librarian alone, the Society owes a vast debt, whilst outside the Society he made a great name for himself in the little world of professional librarians and in the history of the Library Association. Although he was unable to accept the invitation, it is worth recalling that in 1905 MacAlister was invited to attend the International Library Congress in St. Louis as one of the representatives of European librarianship. At the time of his appointment about 3,900 books were borrowed annually and about 4,500 readers used the library. Storage space was becoming an acute problem. In the words of the president at that time, "every year there was increasing difficulty in placing the books of the constantly growing library. The room used for the Society's meetings, the council-room, and the committee-room all contained books." The Society moved to larger premises in 1889, at 20, Hanover Square, but three



Interior of the Wellcome Research Library.

years later further work had to be done there to give additional library space. In 1905 a new store to house 10,000 books was built behind the meeting-room. Even so, books were again invading the corridors.

It was not until MacAlister's day that the library "services" as well as the library collections received serious attention. Quite early in his term of office he made the library more accessible by an increase in the hours of opening. (By 1898 the library was open daily from 11 a.m. to 6.30 p.m.) In the *Lancet* of June 16, 1910, a letter appeared over his signature offering a service to provide abstracts and to undertake searches of the literature for Fellows living abroad. He wanted to make it as easy for "the man in the Andes" to benefit from the library as for the man in Wimpole Street. It was primarily to benefit the man who was unable to come and use the library himself that MacAlister planned library "services."

Amalgamation

In the first years of this century MacAlister was deeply concerned in the negotiations which, in 1907, resulted in the formation of the Royal Society of Medicine. The amalgamation brought several special collections of books to enrich the Society's library, of which the most extensive were the libraries of the Obstetrical Society of London (15,000) and of the Odontological Society (5,000). The Laryngological Society had placed its books in the care of the R.M.C.S. in 1902; the Ophthalmological Society of the United Kingdom, whilst maintaining its separate existence, deposited its library, under special conditions, in the new R.S.M. These additions not only filled gaps in the collection of the R.M.C.S. but also provided duplicate copies of many important early works. The benefit of this duplication has become increasingly apparent with the growth of the library's lending service.

Following the amalgamation, MacAlister carried through the building of the Society's house on its present site. This new building was opened in 1912.

In 1924 the room formerly known as the Marcus Beck Laboratory was handed over to the library, and, as the present Marcus Beck Library, houses a collection of historical works. The Society's historical collections had been greatly enriched in MacAlister's time by gifts from many Fellows, noteworthy among whom were Sir William Osler—he gave the library its only copy of the first edition of Harvey's *De Motu Cordis*—and Albert Chalmers, from whom came a valuable bequest of pamphlets and books which included amongst other rare items a fine copy of the *editio princeps* of Celsus's *De Medicina*. At this time, too, the modern books were arranged in a broad classification which brought collections of books together under a number of headings corresponding fairly closely with the interests of the various Sections of the Society.

Extension of Service

In 1925 the hours of opening were again extended. On Thursdays and Fridays the library remained open until 10 p.m. and was no longer closed during August, although late opening was suspended during that month. In the same year the service providing abstracts and bibliographies was officially extended to all Fellows. This year also marked the end of MacAlister's long term of service to the Society. He had been appointed secretary and consulting librarian in 1901, and throughout the period his influence on the development of the library, under its successive librarians, Archibald Clarke, C. R. Hewitt, and H. E. Powell, was of inestimable value. The library which he first directed in 1887 served 745 Fellows. At his retirement this number had grown to 4,000.

By the middle 'thirties the library had further grown under Mr. G. F. Home. He introduced a formal classification on the Brussels system; to its ever-growing collections of journals he added the most complete collection in the country of the great French and German encyclopaedic works. The scope of the journal collection was also increased. Most of the American State journals of medicine were included

as well as a number of smaller hospital journals. Their value was derived mainly from the growing custom of reporting original work in them at an earlier date than would have been possible in the large national journals. The collection of sanitary reports was also increased as a result of efforts to collect the annual reports of all medical officers of health. A *List of Periodicals in the Library* complete to December, 1937, was published in 1938. The bibliographical services were maintained and arrangements made to file and preserve copies of all lists prepared and all translations made so that they remained as a source of information for all Fellows. Indeed, this service was almost too successful. Its usefulness produced increasing demands, with the result that the time-lag between the receipt of a request and its satisfaction became a pressing problem. In an effort to lessen inconvenience to Fellows a quick reference service was introduced, aiming at the speedy tracing of a limited number of articles to provide either an adequate review of a subject or a starting-point from which a Fellow can follow a subject in greater detail. This was indeed a period of rapid expansion, and at the time of his retirement Mr. Home left a greatly enlarged and enriched heritage to his successor, Mr. P. Wade.

By 1939 the library stock was approaching the 200,000 mark and space was again becoming scarce. Extra stacks had been erected in the basement and structural alterations made on the first floor to give more space.

The outbreak of war arrested the immediate demands on space, but inevitably brought its own problems. Some 40,000 of the rarer books and journals were moved out of London. They were stored so as to be available, and eventually provision was made for a small reading-room in this store. The main library also remained open. In addition to the photostat machine, microfilm apparatus was provided in order to copy material needed by Fellows in the Services; and microfilm readers were distributed, through the Army authorities, to establishments abroad. As in the first world war, the library was again opened to members of the Allied Forces.

After the war strenuous efforts were made to close the gaps in runs of important Continental journals. Once again an honorary librarian, Dr. T. C. Hunt, followed in the steps of the first honorary librarian, and made a Continental tour in search of material to complete the collections. Thanks to a generous grant from the Rockefeller Foundation, the Central Medical Library Bureau was set up and carried out extensive copying (from the Society's and other libraries' stocks) of out-of-print journals urgently needed by war-damaged libraries at home and abroad.

A Contribution of Outstanding Value

With the renewed flow of books and periodicals, the return of volumes from their store, and the increase in the number of Fellows, space was once again the main pre-occupation of the Council and librarians. The library began to spill over into corridors and committee-rooms as it had done previously, and the need for enlargement became increasingly urgent. Sir Henry Dale had been president of the Society during the years 1948-50 and was fully aware of these problems. On relinquishing office to Lord Webb-Johnson, he announced an offer from the trustees of Sir Henry Wellcome to provide a large sum of money for the extension of the library. This could be achieved by adding a fourth floor to the Society's house and altering the existing second floor so as almost to double the library space. At a Council meeting on October 17, 1950, the president reported the offer and expressed his deep appreciation of it. He called it "the most important matter which had been considered by the Council of the Society since 1907." The moment indeed was propitious, as Lord Webb-Johnson's experience in similar constructional enterprises was unrivalled. The result has been the addition of the fine Wellcome Research Library—a contribution of outstanding value to the progress of British medicine. For some years the librarians are, as a result of the most generous act in the history of the Society, again free from the recurrent anxiety about space.

TOBACCO A BLESSING?

"NO," SAY THE HUNTERIANS

"That tobacco is a blessing" was the proposition moved at a discussion meeting of the Hunterian Society at Apothecaries' Hall on November 16. After a number of speeches, serious and quizzical, the proposition "That tobacco is a blessing" was defeated, in an assembly of about 200 people, by a very large majority. The opener of the debate in favour of the motion was to have been Sir Alan Herbert, who was prevented by illness from attending. He sent a note in which he qualified his advocacy of tobacco by admitting that smoking was a barbarous practice and that a pipe was not really enjoyable until it was absolutely filthy.

Sir HENEAGE OGILVIE, President of the Society, who proposed the motion, said that he was ready to admit that cigarette smoking was a dirty, expensive, and psychopathic habit, likely to lead to cancer of the lung, duodenal ulcer, smoker's heart, and ash on the waistcoat. But the motion referred not to cigarettes but to tobacco, and who would say that tobacco was not a blessing? Wherever strong men went out into the wide open spaces of the earth they were accompanied by their pipes; statesmen smoking cigars presided over the councils of nations. It was smokers who had given us dominion over palm and pine, who had ensured that Britons never should be slaves. What was England before Raleigh? A downtrodden outpost of Europe. But after Raleigh how great she had become. The Dutch, the French, had failed to beat her. Napoleon and Hitler (a non-smoker, by the way) had gone down before her. "I do not feel that we can risk the great decadence that would be bound to come to a country which has no minor vices."

The Cost to the Community

Mr. DICKSON WRIGHT was the leading advocate on the other side. To him smoking in any form was anathema. A blessing? Perhaps so, to the man who indulged in it, but what of the community? The amount of tobacco consumed in a year would fill every cubic inch of space in St. Paul's Cathedral. The annual tobacco bill was £800 millions. A good smoker might consume half a hundredweight a year. He believed that many smokers secretly deplored their bondage to it. The habit was unattractive. He preferred the dignified figures of the past—the younger Pitt, Melbourne, Disraeli—to the pictures of their descendants, Baldwin with his pipe and Churchill with his cigar. On the stage how incongruous it would be to have Hamlet uttering his soliloquy pipe in mouth. What would Shakespeare have thought of a Noel Coward piece with smart sayings interrupted by cigarette puffs? He had counted the number of times cigarettes were lighted on the stage in modern plays—the record was 53 in a single play. In the auditorium the waning and waxing of interest in a play could be estimated by the manner in which the cigarettes glowed and smouldered out. He also complained of smoking by dignitaries of the Church. It was incongruous for a minister of the Gospel to allow himself to smoke whilst condemning lots of things of a more physiological nature. In private life he thought that ladies lost some of their charm by smoking. At no period of her life was a woman improved in appearance by a cigarette. It was a great triumph for the tobacco manufacturers when they overcame the delicacy of the female sex. It only remained for them to get the habit firmly established in the schools and then the home market would be fully saturated.

Smoking in the medical profession, Mr. Dickson Wright continued, was also a bad thing. The doctor whose clothes, breath, and fingers were malodorous from tobacco was a less good doctor. Nurses too—the question of smoking in uniform was exercising that matriarchal body, the General Nursing Council. At hospital the administrative staff, the porters, the cooks, the maids all smoked at their work. There seemed to be little restraint anywhere in the use of tobacco. It was not a blessing to the country; we should be much happier without it.

A Word in Defence

Dr. R. R. BOMFORD appeared as the chief supporter of the motion. He claimed only that this innocent herb had been a pleasure, a solace, and sometimes a delight to peaceful, well-adapted personalities for at least 400 years. He reminded the audience of the vast numbers of people employed in the tobacco industry, of the £600 millions or more that it produced in revenue, of the fact that it prevented thousands of people from getting fat, of the contribution it made to the serenity of the home, of the fact that a by-product was an excellent sheep dip. Much of the propaganda against it was irrational and prejudiced. In a recent controversy both cancer and smoking were subjects charged with emotion, so that it was not surprising that the combination led to outpourings of biased wrath. He had no quarrel with the work of Professor Bradford Hill and his associates, but it would be interesting to learn a little about the fate of male non-smokers. Did they retire to dark corners and die slowly from myocardial degeneration?

He complained of the term "addiction" as used in the case of tobacco. Smoking was a habit but not an addiction; there were no withdrawal symptoms. If people were to give up smoking because of the fear of dying from cancer of the lung they might as well give up bacon and eggs for breakfast, because this increased the coagulability of the blood and so made the partaker more liable to coronary thrombosis.

Smoking and Lung Carcinoma

Dr. HORACE JOULES, speaking with great earnestness, asked why, if tobacco was such a blessing, it was necessary to spend so many millions on persuading people to take up the habit. Of the dire results of smoking he pointed to the smokers' cough, which in the man who had been long addicted to a heavy daily consumption of cigarettes was not to be distinguished from the cough of lung cancer or advanced tuberculosis. Bronchitis was a curse of the community, and largely accounted for the fact that expectation of life of persons over 50 was little above the figure in the early part of this century. In 1950 16½ million working days were lost by the insured population on account of chronic bronchitis. Tobacco was said to be a germicide, but in fact it prepared the bronchi for infection. Professor Bradford Hill's dispassionate study had not been refuted by any tobacco concern. Far more people were now dying of lung cancer than of pulmonary tuberculosis. There were three times as many deaths as from road accidents. Excessive smoking was hindering the surge forward in preventive medicine, particularly in respect of chest diseases. The difficulty was that the Treasury had a vested interest in this "blessing" to the tune of some £630 millions a year. He pointed to the vast amounts of tobacco imported which had to be paid for in dollars, while the allocation of cortisone was negligible by comparison. He begged his audience to experience the improvement in physical and mental well-being which would follow three months' abstinence.

As stated, the show of hands resulted in so large a majority against the proposition "That tobacco is a blessing" that the numbers were not counted.

Last year, according to the statutory Home Office return, over two million experiments on living animals were performed. The great majority of these (86%) involved no operative procedure, but simply inoculation, modification of the diet or environment, or administration of a drug or toxin. About 250,000 experiments were surgical operations under anaesthesia, many being of a minor character. Over half of all the experiments were made during the preparation, testing, and standardization of therapeutic substances; another 400,000 on behalf of Government departments and bodies such as the Medical and Agricultural Research Councils; 200,000 for public health purposes or directly for the diagnosis of disease, and 96,000 in the course of cancer investigations. Throughout the year 4,491 persons held Home Office licences, although apparently 1,335 licensees performed no experiments.

Reports of Societies

ACUTE LUNG INFECTIONS IN GENERAL PRACTICE

The subject of common acute lung infections in general practice was discussed by the General Practice Section of the Royal Society of Medicine on November 28.

Dr. JOHN FRY opened the discussion by defining the magnitude of the problem; 25% of all the patients he saw in his general practice were suffering from respiratory infections, and chest diseases accounted for 10% of all deaths. Acute pneumococcal pneumonia was a rarity in general practice, and textbook descriptions and classifications of the pneumonias were confusing and inadequate. Non-specific pneumonia without clinical signs of consolidation was common and received little mention in the books, and there was little agreement about the precise meaning of acute bronchitis; to some it meant merely productive cough with fever, to others the diagnosis required the presence of definite physical signs of abnormality.

Pneumonia was first classified on the basis of clinical description, then the morbid anatomists distinguished lobar and broncho-pneumonia, and most recently Dr. Scadding had emphasized the distinction between specific bacterial or viral pneumonias and the non-specific pneumonias, in which there was some abnormality in the respiratory tract predisposing to invasion by commensals. In general practice this classification was not altogether practical, since elaborate procedures were often required for precise bacteriological diagnosis.

A Clinical Classification

Dr. Fry said that in his own practice in South-east London he saw 60 to 80 patients with acute respiratory disease each year, mainly in the autumn and winter. He had found the highest incidence (135 per 1,000 at risk) in the over-70 and 5-to-9 age groups. He placed little reliance on pathological or radiological investigation and subdivided his cases into diffuse, with scattered and bilateral signs (53% of his cases), and local, with signs in one or more localized areas only. The second group were subdivided into those with (5%) and without (42%) clinical signs of consolidation. The diffuse infections had a sudden onset with cough and variable dyspnoea, and the physical signs included bilateral rales or rhonchi or both; these infections were either primary (no previous chest history) or secondary (previous chronic bronchitis, measles, or whooping-cough). The diffuse primary type occurred mainly in the under 10's and the diffuse secondary type in the over 40's. The cases with local signs of consolidation formed a small group (12 patients only); they usually responded to antibiotics.

Cases with local signs without clinical evidence of consolidation were very common in Dr. Fry's practice, but were scarcely mentioned in standard books. They were mild infections occurring at all ages, but especially in children, and rapidly resolved. The onset was insidious, though there was often a preceding nasal discharge; the systemic disturbance was variable, and the patients often remained ambulant with little or no fever or tachycardia. There might be an irritating cough, or chest pain, and at one or other base there was an area of diminished air entry, maybe impaired percussion note, and a shower of inspiratory rales. There was disappointing correlation of the radiological appearances with the clinical signs. The erythrocyte sedimentation rate and white-cell count were usually normal, specific pathogens in the sputum were not found, and in only a very few patients were virus complement fixation tests positive. The condition might be caused by a primary low-grade infection, or by mechanical aspiration bronchial embolism producing segmental or lobular collapse, with secondary infection. Treatment consisted in control of the infection, when necessary, and postural drainage with breathing exercises to overcome the mechanical factors.

Dr. Fry concluded by asking a number of questions, for which answers had still to be found. What, he asked, was the relative importance of mechanical embolism, allergy, and degeneration; what was the influence of season and climate; what was the relation of chronic bronchitis and influenza to the acute chest; and what part did fog play?

Aetiological Factors

Dr. J. G. SCADDING said that a classification, to be logical, must be on the same basis—for example, aetiological—throughout. With the pneumonias this was impossible, because there were still unidentified aetiological agents, and present knowledge was often difficult to apply in actual practice. Furthermore, not every infection had only one aetiological agent, and often mechanical factors played a part. He referred, in this connexion, to the series of cases described by Ramsay and himself in 1939; these patients were suffering from acute upper respiratory infections or chronic bronchitis with an acute flare-up, and were found to have localized opacities in the radiograph. This was attributed to aspiration of mucus infected with upper-respiratory-tract commensals with resulting obstruction of a bronchus, notably in the posterior segments when the patient was recumbent. This was followed by absorption of the alveolar air and a mild pneumonic reaction.

Dr. Scadding then outlined his own classification of the pneumonias. There were two main groups: *Specific infections*: (a) bacterial (pneumococcal pneumonia was still common in hospital practice); (b) viral (of which the psittacosis-ornithosis group was the only named one, though there certainly were other unidentified pneumotropic viruses causing what was still sometimes known as primary atypical pneumonia); (c) associated with viruses (notably with measles and influenza) and due to the combined action of virus and bacteria; and (d) rickettsial (Q-fever) and other rarer infections. *Aspiration pneumonias*: (a) diffuse—that is, bronchopneumonia—including post-operative, deglutition, terminal, hypostatic, and inhalation pneumonias; (b) localized; and (c) suppurative pneumonia. He related two typical case histories to illustrate the differences between virus pneumonia and aspiration pneumonia. The patient with virus pneumonia, in contrast to the one with aspiration pneumonia, had severe constitutional disturbance, with only minimal respiratory symptoms.

Aetiological diagnosis, in Dr. Scadding's opinion, was difficult. Bacteriological examination of the sputum was hampered by irregular distribution of pathogens in the sample. Serological diagnosis was dependent on the demonstration in a rising titre of specific antibodies or cold agglutinins, and could often be made only retrospectively. Treatment must be started without a precise diagnosis, and Dr. Scadding referred to a previously published study undertaken in 1950 in which the results of treatment of clinical pneumonia by standard methods—penicillin or sulphonamides—were compared with treatment by aureomycin and by chloramphenicol. In this trial the standard treatment was at least as effective as the newer antibacterial agents, was accompanied by fewer side-effects, and was much cheaper.

Radiological Diagnosis

Dr. PETER KERLEY showed an interesting series of radiographs illustrating the radiological features of different types of pneumonia. In pneumococcal pneumonia the opacity spread out from the hilum, and when the whole lobe was consolidated its bulk was usually increased. Increase in the bulk of a lobe or a segment was a feature of all bacterial pneumonias, while interstitial changes predominated in the virus diseases unless there was secondary infection. Pseudo-cavities due to acute vesicular emphysema were common during resolution in children. Delayed resolution and atelectasis were rare, but might be followed by bronchiectasis. Tuberculous pneumonia, measles pneumonia, and virus pneumonias (sometimes involving multiple segments) associated with upper respiratory infections were also illustrated.

Correspondence

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

Sterilizing Ampoules

SIR,—Your issue of November 21 (p. 1165) reports an action for damages brought by two patients in whom spinal anaesthesia was followed by paraplegia. This was said to have resulted from contamination of the anaesthetic by phenol, in a solution of which the ampoules had been stored.

I wish to suggest that the antiquated practice of storing ampoules, whether of such solutions, of catgut, or any other material, in disinfectant solutions, or even of "dishing them up" in such solutions, should be altogether abandoned. The surface of these ampoules, if the surgeon is to open them, must of course be sterile, but this can be ensured in more convenient and less dangerous ways, apart from the use of heat, which is applicable to some of them. There are two obvious possibilities: (1) that they be sterilized by the manufacturer, and protected against contamination before use by covering with "cellophane" or enclosure in an outer glass tube; and (2) that they be sterilized chemically by the user, but after immersion for a sufficient time in a suitable solution they should be transferred to sterile distilled water to free them of the disinfectant, and then stored in an air-tight container until required. It does not seem to be generally understood that once an object has been sterilized it can be kept so indefinitely, or as near sterile as does not matter, merely by protection from atmospheric dust. An easy way of ensuring this is to place the ampoule in a plugged sterile test-tube. If something more elaborate and commodious is wanted, it should not be beyond modern engineering skill to construct a cabinet, of itself sterilizable, which would accommodate numbers of such ampoules under conditions affording complete safety.

If it is a fact that solutions can traverse the apparently intact walls of these ampoules, it would be a wise precaution to colour the disinfectant solution strongly so that the results of this process can be seen. A suitable disinfectant would be liq. formaldehydi chirurgicis acting for six hours: this will kill anything, including spores, which phenol will not.—I am, etc.,

London, E.C.1.

LAWRENCE P. GARROD.

Amoeboma of the Caecum

SIR,—In his memorandum (*Journal*, November 14, p. 1087) Mr. E. N. Callum tells a sad story which might well have had an even sadder ending. While Mr. Callum gives us details of his surgical interference, there are many other things that he does not tell us. For example, he says that the patient was a clerk of 34 years, but he does not tell us where he spent those 34 years. Since an amoeboma does not grow in three days, it would have been interesting to know what earlier symptoms the patient had had, or, in the complete absence of any symptom, an assurance of this fact. He states that, on the original diagnosis of appendix abscess being made, antibiotics were given, but he does not tell us which antibiotics and especially whether they included aureomycin, for example, for which amoebicidal properties are claimed. One would like to know what the pathologist thought about the supposed neoplasm during the three weeks between the operation and the sloughing of the abdominal wall; in fact, we are never told what the pathologist did eventually conclude about the tumour, and we have only the title of the paper to suggest that it was an amoeboma. Had it been a neoplasm combined with an *Entamoeba histolytica* bowel infection, the immediate result might well have been the same.

Mr. Callum's comment is both wise, in that he gives the excellent advice that when doubtful masses are found in the bowel amoebiasis should be excluded, and laudable, in that he risks personal criticism to ensure that others do not fall into the same error—but he does not go far enough. In his last sentence he writes: "... while the presence of unusual masses in the rectum or elsewhere in the bowel may call for a search for *Entamoeba histolytica* in the stools before proceeding to surgery." Does he mean one or two hurried stool examinations by the hospital technician, who will rarely be experienced in identifying *Entamoeba histolytica*? If so, surely the procedure would be valueless to exclude amoeboma. Even a dozen such examinations by an experienced parasitologist would be inadequate and would take time that could be much better spent in the carrying out of an adequate therapeutic test with emetine.

This case report exemplifies the timeliness of the memorandum presented by the council of the Royal Society of Tropical Medicine and Hygiene at the recent World Conference on Medical Education; two of its main points were that all students should be taught to include in their case histories the past geographical movements of patients, and that their courses of instruction should at least include a few lectures on tropical medical and surgical emergencies that are likely to be encountered in non-tropical countries.—I am, etc.,

London, W.1.

L. EVERARD NAPIER.

Malaria in Ex-Servicemen

SIR,—Sir Neil Hamilton Fairley, in his letter about "Malaria in Ex-Servicemen" (*Journal*, November 21, p. 1157), states: "Outside the armed Forces and the various hospitals for tropical diseases, many patients with vivax malaria only receive treatment with schizonticidal drugs..." (my italics). He goes on to recommend, apparently in all cases, a course of one of the 8-aminoquinoline drugs.

In the Refresher Course article on malaria (*Journal*, October 27, 1951, p. 1021), Sir Gordon Covell writes: "The routine administration of (the 8-aminoquinolines) in all cases of vivax malaria is not recommended. They should be reserved for the treatment of stubbornly relapsing cases, more especially in circumstances where there is no risk of reinfection."

As the vast majority of the cases of vivax malaria in ex-Servicemen, at least in those returning from Korea, do not fall into the category of "stubbornly relapsing" it would be of interest to know why these eminent authorities differ.—I am, etc.,

Glasgow.

I. B. MUNRO.

SIR,—The attention recently given to relapsing malaria in the medical press is most timely. I venture to suggest that the huge majority of medical men are nevertheless left without the faintest idea of the optimum treatment for this condition. I have found that a number of practitioners in this neighbourhood have been grateful for some forthright guidance in this matter, with consequent benefit to their ex-Service patients. I therefore feel that practitioners would warmly welcome a simple directive from the Ministry giving clear-cut advice on the therapy of malaria. One has only to question patients admitted for malaria to discover the urgent need for such authoritative guidance.

The corollary to this is the great research opportunity that is being lost through lack of any standardizing of treatment. The arguments in favour of self-determination in prescribing are irrelevant when applied to the treatment of tropical diseases in temperate climates.

There is one other point I should like to stress. Far too little prominence is given to one of the great cardinal signs of malaria—namely, vomiting. In any ex-Servicemen from Korea suffering from pyrexia and vomiting without physical signs, malaria should be thought of first.—I am, etc.,

Worcester.

C. F. J. CROPPER.

Histoplasmosis in Great Britain

SIR,—The lack of clarity in our paper must have been due to its brevity. We meant to infer that the cases described, including that of Duncan,¹ did not conform to the criteria accepted for *Histoplasma capsulatum*. This in fact has been accepted by Duncan himself in his letter (*Journal*, November 14, p. 1103).

To correct and amplify the statement made in the latter part of his letter I should point out that we now have information to the effect that, including the case described by us, five cases of disseminated histoplasmosis have occurred in Great Britain, and two cases showing the local manifestations without apparent dissemination (including the case described by Duncan in 1947) have also been reported, making seven cases in all. Of these five cases of disseminated histoplasmosis, one was diagnosed during the patient's lifetime (the case we described), another was suspected during the patient's lifetime but confirmed on necropsy. The three other cases were only diagnosed at necropsy. Of this group of five cases, four gave positive cultures of *Histoplasma capsulatum*, whereas the fifth did not, the organism in this case only being identified in stained sections of the tissues. Of the two cases presenting with local lesions, the case described by Duncan gave a positive culture which was not typical of *Histoplasma capsulatum*, but probably due to related species now given the name of *Histoplasma duboisii*. Positive culture was not obtained from the other case.

It is extremely difficult to know whether it is justifiable to distinguish the clinical manifestations of the condition due to *Histoplasma capsulatum* from that due to related species, but there would appear to be some evidence at least to suggest that the disseminated histoplasmosis as classically described is invariably due to the typical *Histoplasma capsulatum*.—I am, etc.,

Romford, Essex.

REFERENCE

- ¹ *Trans. roy. Soc. trop. Med. Hyg.*, 1947, 40, 364.

Control of Tachycardia by Quinine

SIR,—With reference to Dr. C. W. F. Winckel's letter (*Journal*, November 14, p. 1103), Wenckebach was not the first to discover the beneficial effect of quinine in some heart disorders. Pride of place goes to Senac, who published an account of quinine being used in such circumstances in the year 1749.¹ Wenckebach merely followed up a chance observation of one of his patients who was taking quinine, and discovered that it was exerting an effect on the heart rate.—I am, etc.,

Collingborne Ducis.

REFERENCE

- ¹ *Traité de la Structure du Cœur, de Son Action et de Ses Maladies*, 1749, Vol. 2, p. 526. J. Vincent, Paris.

Cough Syncope

SIR,—Professor E. P. Sharpey-Schafer (*Journal*, October 17, p. 860) describes the physiological mechanism of syncope after coughing. The syncope from coughing was shown to be due to vasodilatation following stimulation of baroreceptors by large arterial cough transients. It is interesting to note how this syncope can be induced by stimulating the carotid sinus reflexes,¹ and one feels that in syncope after coughing this particular reflex plays a large part. Watching these patients, who are usually short-necked people, coughing, one observes the tendency to raise the shoulders and tighten the neck muscles.

I am of the opinion that these patients who lose consciousness, and all who cough violently and thus induce different degrees of dizziness, should be taught to cough differently. As soon as the patient feels "the upper respiratory tickle" he should bend slightly forward, pushing his chin forward and stretching the neck muscles. I do not know if this manoeuvre protects the

carotid sinus, reducing the stimuli to the receptors there, or if the varying of the stance adopted reduces the violence of the cough. Professor Sharpey-Schafer points out that when coughing is associated with expectoration there is no syncope, and the usual posture adopted when bringing up phlegm is one with the neck extended.

During the last two years I have had three cases of syncope after coughing. One was a doctor, aged 48, who had not smoked for four years because it made him cough so much. He had a fit of coughing when sitting playing bridge, and this was followed by an attack of syncope with slight convulsions. Another was an accountant aged 38—a heavy smoker. He fell in the street following a coughing bout. I had previously warned this man of the possibility of syncope, because I had seen him coughing. A third case was that of a man aged 80, a heavy smoker, who had a coughing bout in a train and fell on the carriage floor. Each of these three men could be described as being short-necked. Only the second patient wore tight neckwear.

The first and second patients had had no previous attacks, but the third had had them on a number of occasions and was afraid to consult a doctor, believing he was suffering from some strange malady. It is possible that in the case of this elderly man he was prone to frequent attacks because of atheromatous changes in the blood vessels causing increased hyperactivity of the vagal reflex arc.² None of these three patients have had any attacks of syncope since they have adopted the posture that I have described.

It would be interesting if one could ascertain the difference in the intrathoracic pressure in a patient coughing with his shoulders shrugged, and coughing with his neck extended.—I am, etc.,

Hove.

S. CALLER.

REFERENCES

- ¹ Evans, E. (1952). *J. Amer. med. Ass.*, 149, 46.
² Judson, W. E. (1953). *Med. Clin. N. Amer.*, 37, 1313.

Treatment of Plantar Warts

SIR,—Every day I am confronted with warts plantar, warts palmar, warts digitate, warts acuminata, warts plane, and warts vulgar, and they never cease to rouse my spleen because they are there, because their possessors demand their instant removal, and because this puts me to so much unnecessary trouble and expense of time. For I know that I do not know very much about warts; and yet I know enough about their ways to know that they have the laugh of me—they, and the owners of the gift of charming. Whereas I have to bring a whole armoury to bear, curettes, cylinders of carbon dioxide, containers of liquid nitrogen, red-hot wires, x-ray tubes, and the like, the charmers blithely pronounce the warts cured and behold they vanish—sometimes, but sufficiently often to impress. Those people who believe that such things only happen to the simple-minded in the depths of the country should read of what befell Sir Francis Bacon in Paris in the year 1576, as recorded by Walter de la Mare (on p. 690) in his delightful anthology *Come Hither*. To those who feel that there is more virtue in numbers and a planned experiment I recommend an article by Bruno Bloch.¹ There is no doubt about it, the charmers and we are armed like David and Goliath. And their mystification at their success is not the least galling part of the matter. And so, Sir, beset as I am by these verrucosities which I detest and which are a daily reproach to me, I have been goaded into writing to you by the telling shafts of your annotator on plantar warts (*Journal*, November 14, p. 1093), who has no doubts about our ignorance of this subject. My observations do not go very far, but they might form a stepping-stone for others.

There are at least two kinds of plantar wart. One is painful and penetrates the skin deeply. It can be curetted out most satisfactorily, and when this is done leaves a deep, round hole with an overhanging rim of stratum corneum. The other kind is a dry, crumbling affair, causes little pain, and is superficially placed in the skin. Curettage of this kind discloses the wart as a plaque of tissue compounded of hundreds of small warts. The hole left by this second kind is a shallow thing, polycyclic in outline. The natural history of each kind after curettage varies, for whereas the former is usually cured the latter usually reforms. The resistance of the latter kind to curettage is typical of its behaviour with every kind of treatment, and so is the

willingness of the former to disappear. These two kinds of wart are well known as "the plantar wart" and "the mosaic wart."

Thus far there is nothing new, but Dr. J. A. R. Miles and I discovered² that the clinical distinction was also histological. The bulky plantar wart contained eosinophilic inclusion bodies, both intracytoplasmic and intranuclear. The mosaic wart did not. This plantar wart which contained inclusion bodies we proposed to call a myrmecia for historical reasons. The myrmecia, we found, occurred on the hands occasionally, where it preserved its clinical characteristics, except for a greater projection above the surface on account of the absence of pressure. The common wart of the hands was devoid of inclusion bodies, and where a patient had warty hands and feet myrmecia would pair with myrmecia, and common wart with mosaic wart. In a transmission experiment the myrmecia extract gave rise to a myrmecia and the common wart extract to common warts. Finally, Strauss and others in America,^{3,4} working independently, claimed to have photographed wart virus under the electron microscope. They found the virus in some warts but not others, and it seemed to me from their description that the warts which produced virus were identical with our myrmecia.

Nothing which I have seen since we wrote our article has made me want to alter our conclusions.—I am, etc.,

Edinburgh, 12.

ALAN LYELL.

REFERENCES

- ¹ *Klin. Wschr.*, 1927, 6, 2271 and 2320.
² *British Medical Journal*, 1951, 1, 912.
³ *J. invest. Derm.*, 1950, 15, 433.
⁴ *Proc. Soc. exp. Biol. (N.Y.)*, 1949, 72, 46.

SIR,—Your annotation (*Journal*, November 14, p. 1093) prompts me to suggest a simpler method of treating plantar warts than those described. This method was described by Dr. W. Gillies Annan¹ and consists in injecting a 5% aqueous solution of phenol through normal skin at the edge of the wart into its base. The prick is painless, but the actual injection is very painful for a few seconds. The patient, however, walks away painlessly and cured, for the wart disappears in a few weeks.

I have dealt with dozens in this way without a failure. I always warn the patient—usually a school-child—that the injection will be painful for a moment, but with explanation this prospect is usually accepted when weighed against the continual pain of walking on a wart: and most children are quite ready to be brave.

My only modification of Dr. Annan's method is to use less fluid than he suggested. I find that 1–3 min. (0.06–0.18 ml.) is usually sufficient. He recommended 5–10 min. (0.3–0.6 ml.). The method is speedy, apparently safe, and sure.—I am, etc.,

Reading.

P. M. R. HEMPHILL.

REFERENCE

- ¹ *Lancet*, 1948, 1, 926.

Routine Lumbar Puncture in Primary Tuberculosis

SIR,—This problem, mentioned in "Any Questions" (*Journal*, November 7, p. 1058), was well illustrated by a boy aged 2 who was admitted under my care last March with an acute tonsillitis and meningism. Lumbar puncture produced a normal C.S.F. He became afebrile on the third day, but the temperature began to rise on the fifth day and meningism developed again, so that a further lumbar puncture was carried out, and this showed all the changes of tuberculous meningitis.

The boy was in contact with his grandfather and had been under regular observation for tuberculosis for some time. One year previous to admission the Mantoux 1/100 was positive, so that he had evidently been infected at least a year prior to admission. It is possible that the acute infection precipitated the tuberculous meningitis, but it seemed to me more likely that the lumbar puncture had done so.

The boy's further history is of interest, as he developed poliomyelitis whilst still under treatment, but the paralysis was limited to the left upper arm which has never been injected, though he was receiving daily intramuscular streptomycin injections into each thigh before, during, and after the superadded virus infection occurred.—I am, etc.,

London, N.18.

IAN G. WICKES.

Lumbar Puncture

SIR,—Dr. William Goody, in his article on lumbar puncture (*Journal*, November 7, p. 1040), made no mention of the lateral approach. If the needle is inserted an inch (2.5 cm.) from the midline the tough intraspinal ligament is avoided and the progress of the point of the needle through the dura is more readily detected by the fingers. Very little practice is required to estimate correctly the angle that the needle must make to the median sagittal plane.—I am, etc.,

REX BINNING.

Hove.

SIR,—I was interested in the article by Dr. W. Goody on lumbar puncture (*Journal*, November 7, p. 1040), which, I gather, was only a preliminary article in a series. There are, however, two questions I would like answered: (1) should a lumbar puncture ever be performed in the home, and (2) if so, when?—I am, etc.,

W. A. BALL.

Petworth, Sussex.

Milk and Protozoal Infections

SIR,—The publication of Professor B. G. Maegraith's letter (*Journal*, November 7, p. 1047) stimulates me to record the following facts that have recently come to hand through the kindness of Miss L. M. Fagg, nursing sister at the Baptist Mission Hospital, Yakusu, Belgian Congo. We were interested in the suggestion made in the article by Professor Maegraith, Mr. T. Deegan, and Dr. E. Sherwood Jones (*Journal*, December 27, 1952, p. 1382) that a positive suppressive effect of milk might explain the low incidence of malaria in infants wholly breast-fed, and the further suggestion of Dr. F. Hawking (*Journal*, May 30, p. 1201) that the suppression of malaria in the experimental animal raised on a milk diet might be due to the negligible amounts of p-aminobenzoic acid in milk.

During a short period, ten of eleven children under the age of 6 months admitted as in-patients to the Yakusu Hospital had ring-forms of *P. falciparum* present in the thick drop. None of these infants had received any food whatsoever but their mother's milk. Investigations are being continued to discover if other factors are involved.—I am, etc.,

S. G. BROWNE.

London, S.E.9.

Treatment of Tetanus

SIR,—The recent correspondence (*Journal*, November 14, p. 1099) on the prognosis and treatment of tetanus gives the impression that modern treatment rests entirely on the use of the newer relaxants, antitoxin, intubation or tracheotomy, and controlled respiration. No reference is made to surgical excision of the site of infection, but surely the question of whether or not this has been, or can be, carried out is of primary importance in prognosis; other forms of treatment cannot be fully effective if toxin is still being produced at the site of infection.

In 1944, while working with a medical team of the Friends' Ambulance Unit in a very remote part of South-west China, a case of fairly severe tetanus under my care recovered without any adjuvant treatment beyond morphine, chloral, and bromide. No antitetanic serum was available at that time. The site of origin was a septic pulp wound of the right thumb sustained three weeks previously, and symptoms had been present for 10 days at least. The terminal phalanx was amputated immediately, and over two weeks elapsed before the spasms started to abate. I feel sure that recovery was only possible because of the complete extirpation of the site of origin of toxin.

It is to be hoped that recent medical advances in the treatment of tetanus will not obscure the essentially surgical pathology and treatment of the disease.—I am, etc.,

PATRICK D. RAWLENCE.

Diss.

Cancer and the Public

SIR.—Dr. James Brailsford (*Journal*, November 14, p. 1104) is still attempting to spread alarm and despondency among the surgeons who deal with cancer. He has in other letters said, "We have no cure." Certainly no surgeon confronted by a patient with a small, hard, non-fluctuating lump in her breast would promise her relations that she could be cured. But the results of skilful and bold surgery are well worth while. There are different grades of malignancy, and some cases of cancer are hopeless from the start; even at the time of diagnosis the growth has already caused metastases by spread through arteries or lymphatics. Professor McKinnon, of Toronto University, who displays some large and depressing statistics, thinks that the breast cases who live for very many years after the operation are not properly malignant.¹ But this is the opinion only of a distinguished man; he cannot prove it and we need not believe it. Certainly I know women who are well 25 years after removal of breasts that were proved by pathologists to be cancerous. The word "cure" is applicable there.

A large proportion of those in whom the trouble "recurs" after six or seven years have had excellent health in the meantime. It is absolutely wrong to say that untreated women with cancer who live for some time are free from pain, mental misery, or ulceration. Simple mastectomy was much practised by country surgeons 60 years ago; the results were appalling and gave surgery a bad name—operations must be thorough.

Human adult life is not a very long affair, and if surgeons can in a certain proportion of their cases, give a middle-aged woman 5, 10 or even 15 years of cheerful life before the onset of old age (in which she is certain to be afflicted in many ways) they have done very well for her. Claudio said (in *Measure for Measure*): "The miserable have no other medicine but only hope. Let not Dr. Brailsford try to take this away.—I am, etc.,

Hastings.

REFERENCE

¹ *Canad. J. publ. Hlth.*, 1949, 40, 257.

Public Health Laboratory Service

SIR.—While I would agree entirely with Dr. M. T. Parker's opinion (*Journal*, November 7, p. 1048) that close co-operation between the hospital and public health services is essential, and that the form that it takes should depend upon local circumstances, I regard his original description of the function of the Public Health Laboratory Service (*Journal*, October 10, p. 823) as wholly misleading.

Unless there is to be an absurd degree of duplication of resources, I would suggest that the work of the Public Health Laboratory Service should properly be confined to the investigation of established outbreaks of infectious disease, and the routine bacteriological control of water, milk, food, and other environmental factors. General practitioners are now making an increasing use of the facilities offered by the local hospital laboratory, where the haematological, bacteriological, biochemical, and histological aspects of any case can be considered side by side, to the great advantage of the patient. Moreover, the local hospital bacteriologist can offer a diagnostic service at least as efficient as that at the area public health laboratory. Any tests which may be of a particularly specialized nature can be, and often are, referred direct to the appropriate central reference laboratory.

Most of Dr. Parker's article would serve very well as a description of the services already available to general practitioners at the local hospital laboratory. The investigation of some of the illnesses listed would seem to be quite outside the province of the Public Health Laboratory Service, which is fundamentally a bacteriological service. For example, it appears that blood is going to be examined for evidence of glandular fever. Most haematologists would agree that neither a negative nor a positive Paul-Bunnell test should be accepted without a total and a differential white cell count. Such contact as I have had with junior bacterio-

logists under training for the Public Health Laboratory Service has made it clear that the study of haematology plays no significant part in their curriculum. Dr. Parker's article has important implications, and it should be made clear whether the opinions he expressed are to be regarded as the considered policy of the Public Health Laboratory Service.—I am, etc.,

Chertsey, Surrey.

ROBERT J. EVANS.

Site for Vaccination

SIR.—I read with interest Dr. J. Cantor's letter about the vaccination on the sole of the foot (*Journal*, November 7, p. 1050). I had myself only seen and performed vaccination on the arm or thigh, and was surprised when the local general practitioner here vaccinated my daughter just lateral to the second lumbar vertebra. He said he invariably used this site, and claimed almost 100% "takes." This site still allows the baby to be bathed in shallow water, is usually free from faecal and urinary contamination, and it will be concealed by bathing costume or evening dress in later life.

The only disadvantage I can see with the sole of the foot is that if the child is vaccinated or re-vaccinated when she is several months old it will be painful when crawling or walking, and she can easily pull the dressing off—neither factor applying to vaccination at the lumbar site.—I am, etc.,

Ghent, Belgium.

DOROTHY M. ROELS.

SIR.—I was interested to read Dr. J. Cantor's reference to the sole of the foot as a vaccination site (*Journal*, November 7, p. 1050). Six years ago it occurred to me that this would have the advantages that Dr. Cantor has pointed out, and I started using this site then, and always do so now in the case of female infants, except when the mother does not wish it. The only way in which my experience seems to differ from that of Dr. Cantor is that I do not find the percentage of "takes" quite so high on the sole of the foot, as, for instance, on the arm.—I am, etc.,

Canterbury.

PATRICK OSBORNE.

Orthopaedic Care in Poliomyelitis

SIR.—Dr. Hugh Garland and Mr. J. M. P. Clark (*Journal*, November 14, p. 1105) appear to apportion blame equally to "senior members of our profession" for "bickering in public," but Sir Reginald Watson-Jones, President of the British Orthopaedic Association, was doing no more than his duty in pointing out to the Welsh Regional Board the omission of an orthopaedic surgeon in their panel for research in acute anterior poliomyelitis. The Leeds region is to be congratulated for following for the past six years the usually accepted pattern of treatment for this disease.—I am, etc.,

Norwich.

H. A. BRITAIN.

Piperazine in the Treatment of Threadworms

SIR.—Following the publication of our report on a clinical trial (*Journal*, October 3, p. 755) the subsequent wide use of piperazine hydrate in the treatment of threadworms has elicited reports of side-effects not in accordance with our experience. In relation to the very considerable number of cases treated in general practice these reports are few, side effects having been recorded in 14 adults and 6 children. Nevertheless, we consider them worthy of attention. The manifestations are similar in all cases, notably giddiness and lack of co-ordination resulting in dropping things. Sick ness, inability to focus vision, and a sense of detachment have also been noted. These effects have, for the most part, been mild and recovery has been rapid.

Predominantly, these side-effects have occurred in adults as may be associated with wide variations in weight of the patient and with variation in capacity of the domestic tablespoon as unit of measure. Also, the piperazine hydrate is embodied in heavy syrup vehicle which forms a high meniscus when the spoon is completely filled. It is thought that these three factors have occasionally resulted in dosage considerably in excess of

recommended 50–75 mg./kg. The variation in the domestic tablespoon was investigated by measuring the capacity of nine spoons drawn from different households. Each spoon was filled level with water and also to its maximum with the heavy piperazine syrup. While the variation in capacity of tablespoons is notorious, the findings listed below are of interest:

Spoon No.	Filling Level with Water	Overfilling to Maximum with Piperazine Hydrate Syrup
1	5 drachms	8 drachms
2	6 " "	8 " 40 min.
3	6 " 20 min.	6 " 10 "
4	6 " "	9 " 20 "
5	6 " "	9 " 50 "
6	5 " 40 "	9 " 20 "
7	6 " 40 "	9 " 25 "
8	6 " 10 "	8 " 40 "
9	5 " 20 "	8 " 10 "

Note: 1 drachm = 3.5 ml. 60 minims = 1 drachm.

These can be summarized as follows: Of the nine tablespoons filled level with water one held $\frac{1}{2}$ fl. oz. (14.2 ml.), two held 25% excess, and six held 50% excess. Of the nine tablespoons filled to the maximum with piperazine hydrate syrup, eight held 100% excess or more, and one held 50% excess. To take the worst example, it will be observed that in spoon No. 5 the dose of syrup may reach nearly two and a half times the intended 4 drachms.

It is recommended that, in the use of this drug, account must be taken of variation in weight of the patient, and that for the treatment of adults the prescribed quantity should be measured in a graduated medicine glass.—We are, etc.,

R. H. R. WHITE.
O. D. STANDEN.

London, N.W.1.

Sweating in Shock

SIR.—In the *Journal* of October 10 (p. 832) Dr. Ronald Woolmer suggested that some other explanation than sympathetic overactivity was needed for sweating during shock or surgical operations. Experiments carried out by Dr. T. S. Lee and myself¹ have suggested that sweating accompanies extensive central nervous activity of various kinds and that the sweat glands of the axillae, palms, and soles sweat most readily in response to such central nervous causes. Mild sympathetic excitation *per se* does not give rise to sweating.

Although it is undesirable to seek teleological explanations for all phenomena, Dr. Woolmer's request for such an explanation can be met in this case. Extensive central nervous activity in primitive man is most likely to have resulted from fear, anger, hunger, love, or injury, and in all these circumstances recognition of friend or foe is important. Since sweating in the axillae has the strongest smell and since sweating of the soles, and to some extent also of the hands, will leave the most scent in the tracks, it seems teleologically sound that those regions should sweat the most readily in response to central nervous stimuli. Sweating of the hands may also help grasping.—I am, etc.,

Singapore.

E. M. GLASER.

REFERENCE

¹ *J. Physiol. (Lond.)*, 1953, 122, 59.

Single-sample Test in Differential Diagnosis of Jaundice

SIR.—The evidence presented by Dr. Ian Wang (*Journal*, October 31, p. 971) for the inclusion of cholesterol determination in single-sample liver-function tests is undoubtedly convincing, but is liable to be received unfavourably by our already overburdened laboratories. However, there is a simple substitute in the form of the lipid turbidity test described by Kunkel *et al.*¹ which, although indicating changes in the total lipids (which is very often influenced by the phospholipid fraction), appears to parallel very closely the cholesterol content of serum.

The reagent and technique are extremely simple and require a minimum of working time: 1% liquid phenol in 12% NaCl in distilled water is kept in the refrigerator and 0.2 ml. of serum is mixed with 6 ml. of this phenol/saline solution. After standing for 30 minutes, the mixture is shaken and read as in the case of thymol turbidity. The units are calculated by assigning an

arbitrary value of 15 units to a suspension of BaSO₄ (3 ml. of 1.15 g. BaCl₂·2H₂O in 100 ml. water made up to 100 ml. with 0.2N H₂SO₄), which is read as a standard. My own range of normal variation is about 2 to 10 units, but it is a wise procedure for each laboratory to determine its own normal limits. I have used this test for a number of years, and, in addition to Dr. Wang's interpretations, have found it of value in distinguishing between acute and chronic hepatitis, since the former gives high normal or even elevated values, while the onset of cirrhosis is usually accompanied by low values. Indeed, a value below 2 units is of grave prognostic import. High values are found in fatty liver due to alcoholism when often the only abnormality is a raised lipid, while in biliary cirrhosis associated with xanthomatosis very high figures are encountered.

A valuable feature of this lipid test is that it enables one to eliminate false positive thymol turbidities which sometimes (though not always) occur in the presence of a raised lipid. In a recent paper dealing with liver function tests in myeloma, Dr. L. L. Griffiths² found difficulty in correlating some of his positive thymol turbidities with results obtained by other workers in this field. I feel these anomalous positive results are false reactions due to excessive lipid, particularly as Dr. Griffiths's excellent electrophoresis figures show an increase in β globulin in the sera in question and it is now fairly well established that lipid forms a complex with β globulin.

Before using the lipid test, I used to check the thymol turbidity by putting up 0.3 ml. of serum in 7.5 ml. 15% alcohol, which Mawson and I³ found to give almost identical turbidities to those obtained in the thymol test. However, I still carry out this alcohol turbidity test in order to have, together with the lipid reaction, a double check on the thymol reading.—I am, etc.,

Preston.

E. B. LOVE.

REFERENCES

- ¹ *Gastroenterology*, 1948, 11, 499.
- ² *J. clin. Path.*, 1953, 6, 189.
- ³ *Lancet*, 1948, 2, 850.

Turner's Syndrome in the Male

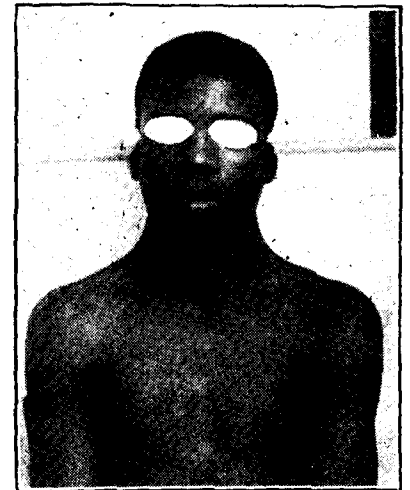
SIR.—The accompanying photograph was taken within three weeks of my reading the article by Drs. R. Sougin-Mibashan and W. P. U. Jackson on Turner's syndrome in the male (*Journal*, August 15, p. 371). The subject is a Zulu youth who had but recently arrived in Durban to seek work. By statutory regulation all such persons have to undergo a medical examination before they can be employed, and as a medical officer to the Native Administration Department about 120,000 go through my hands each year. This is the first case remotely resembling the Turner syndrome that I have seen during the past seven years.

Age 19 years, height 5 ft. 1 in., well built and muscular with a masculine voice, masculine distribution of body hair, a larger than average penis, but testicles small and firm. In addition to the webbing of the neck, the photograph distinctly shows congenital malformation in both ears. Mentally he was bright and gave a good account of himself. He disavowed interest in sex, and never had an erection.

He promised to return for further investigation, but this now seems unlikely. I gather from my staff that he looked upon my activities toward himself as a form of witchcraft, and it was obvious that he was anxious to be off.—I am, etc.,

Durban.

D. F. MACKENZIE.



Nocturnal Myoclonus

SIR,—In regard to your annotation (*Journal*, November 21, p. 1148) on nocturnal myoclonus, I should like to ask whether all the discussion on what has been termed "Ekbom's syndrome" since 1944¹ does not refer to the same subject as that of your annotation. If so, the general opinion seems to have been that the syndrome, sometimes familial in nature, is not definitely related to epilepsy.

Surely the tendency for the myoclonic jerks to appear on going to sleep may be compared to the occasional so-called "hypnagogic apparitions," the myoclonic jerks being due to the lowering of cortical control on going to sleep, and the hypnagogic apparitions being due to the commencing of dreams before brain unconsciousness has been fully established. I think this was an old view entertained before discussion on the subject was resuscitated by the writings of Ekbom and others. I should like also, if possible, to hear whether during the nocturnal myoclonus periods the knee-jerk responses are of the trepidation type.—I am, etc.,

F. PARKES WEBER.

London, N.W.1.

REFERENCES

- 1 Ekbom, K. A. (1944). *Acta med. scand.*, 118, 197.
- 2 Ibid., 1945, Suppl. 158.

SIR,—Last May the *Journal* contained a description of proctalga fugax wherein a hint was given that the condition was an epileptic variant (*Journal*, May 16, p. 1083), and a subsequent correspondent (*Journal*, July 25, p. 224) effectively dealt with this concept by describing his ability to abort this manifestation, including the vaso-vagal sequel precipitated by a heavy operating session, by the intake of amphetamine, but despite the effectiveness of this reply we continue to receive suggestions embracing varied psychosomatic conditions under this generic term and which certainly simplifies the treatment thereof.

I now note the inclusion of nocturnal myoclonus (*Journal*, November 21, p. 1148), which I would have considered in varied effect to be common to all, increased by fatigue, and much more manifest in the lower species. Our little puppy is a past exponent of the art; he includes a manifest tremor of the masseter muscles with same and would not dream of going to sleep without such accompanying enjoyment. Like the knee-jerk, it would be the absence of them that would portray the abnormality, not their presence, and unless we regain our sense of perspective we shall soon be including all forms of sleep-association states, dreams, somnolence, somnambulism, and narcolepsy as epileptic aberration.—I am, etc.,

Tipton, Staffs.

L. H. EUNSON.

SIR,—Arising from your annotation on this subject (*Journal*, November 21, p. 1148), I would like to draw attention to the involuntary jerking which occurs in some people when taking antihistamine drugs. This usually occurs at night and is commoner in the legs. The symptom was first noticed with promethazine hydrochloride, but has since occurred with chlorcyclizine hydrochloride, diphenhydramine hydrochloride, and mepyramine maleate. My experience with the other antihistamines has been limited, and it is quite possible that the jerking may occur with any one of this series of drugs. The exact incidence of this symptom is difficult to estimate. It may not be spontaneously complained of, but if specific inquiries are made it is found to be quite common. In some cases the jerking may be associated with restlessness and general excitement.

That nocturnal myoclonus may be linked with epilepsy is also interesting in connexion with the antihistamines, as it is known that these drugs may precipitate fits in known or potential epileptics. They have also been shown to increase the E.E.G. abnormally in epileptics.¹ In my own experience fits have been precipitated on four occasions by antihistamines and a history of fits is, in my opinion, a clear contraindication to antihistamine therapy.—I am, etc.,

ROBERT P. WARIN.

Bristol.

REFERENCE

- 1 Churchill, J. A., and Gammon, G. D. (1949). *J. Amer. med. Ass.*, 141, 18.

POINTS FROM LETTERS

The General Practitioner and the Psychiatrist

Dr. JOAN W. KIPLING (Hull) writes: I should like to endorse Dr. G. L. Russell's doubt (*Journal*, October 24, p. 939) that "the majority of marital problems can be dealt with satisfactorily by the general practitioner." While some marriages are marred by comparatively simple and well-defined factors—for example, sex difficulties, sterility, lack of economic co-operation—many more are affected by a combination of several factors. If the G.P. lacks wisdom, interest, and, above all, time to deal with marital disharmony he can in most areas call on the help of the Marriage Guidance Council, whose workers are trained to consider social, ethical, and legal, as well as medical and psychological, aspects of marriage and to refer to consultants in each of these fields any case of exceptional difficulty. Many G.P.s welcome help given in such time-consuming work, although many would no doubt undertake more of it themselves if time allowed. Some undergo the training offered by the National Marriage Guidance Council.

Paroxysmal Paralytic Myoglobinuria

Dr. J. D. ROSANELLI (Tortola, British Virgin Islands) writes: In connexion with the discussion of the aetiology of this disease in the paper by Dr. Stephen D. Elek and Mr. Hugh F. Anderson (*Journal*, September 5, p. 533), it is noteworthy that myoglobinuria is invariably associated with creatinuria. Creatinuria regularly disappears on the administration of riboflavin (Hoff, F., 1948, *Medizinische Klinik*, Thieme, Stuttgart, and *Klinische Physiologie und Pathologie*, 1952, Thieme, Stuttgart). It is tempting to speculate that the experimental diet used by Agren (*Svenska Läkart.*, 1944, 41, 665) was not only deficient in aneurine but also in riboflavin. It is regrettable that the phenomenon of the "idiomuscular bulge" and the usually concomitant creatinuria have not been observed in this case.

Eponyms

Dr. W. E. MEDD (Farnham Common, Bucks) writes: There is a dark movement gaining ground which teaches that the names of diseases should be descriptive and not eponymous: thyrotoxicosis not Graves's disease; not Von Recklinghausen's disease but hyperparathyroidism. May I expound an apologia for the eponym? I like names that have a ring of history, names that recall those who were mighty physicians in palmier days. Surely a patient with Addison's disease can feel that he is merely making a small sacrifice for the perpetuation of the memory of the greatest of the Guy's triumvirate; whereas if he had adrenal hypoadrenalism even that crumb of comfort would be denied him. How delightful to have Albright's syndrome; but if one contracted polyostotic fibrous dysplasia one would feel that one was falling to bits. The full glory of the eponym is reached in the multiple-barrelled form: Hand-Schüller-Christian, Rendu-Osler-Weber—those give the tongue something to roll round, and you can almost smell the mothballs in their morning coats and dear old top-hats. Let us condemn dull impersonal names, utility names in a utility age. Can we do no better than X disease or Q fever?

Cancer and the Psyche

Dr. E. JOYCE PARTRIDGE (Exeter) writes: I wish to put forward a plea that some of the money spent on research into the causes of cancer be directed into psychosomatic channels on the grounds that there may well be something in the attitude of mind (either conscious or unconscious) of the cancer victim which predetermines the development of the malignant cells. It has been suggested that it is changes in the body fluids which precede and invite the wanton multiplication of a given cell—i.e., initiate its cancerous growth. If this be so it is worth while to recall that the body fluids are those representatives of the soma which most readily respond to the activities of the psyche: tears, the dry mouth and the polyuria of fear, the changes in the gastric juice accompanying anxiety and mucous colitis, to mention but a few obvious examples.

Breast-feeding in Oxford

Dr. STELLA RING (Bexley) writes: Dr. Grace H. Walker (*Journal*, October 31, p. 995) is surely putting the cart before the horse. Breast-feeding is an expression of maternal love, not a cause, and as such is of incalculable value to the mother and the child. Artificial feeding can be an eminently satisfying experience, and some mothers even feel thirst and breast fullness when giving a bottle; but many more have to be comforted because they themselves are frustrated, however well the baby grows, by the failure of such a link.

Obituary

BASIL HUGHES, D.S.O., M.B., F.R.C.S.

Mr. Basil Hughes, for many years honorary surgeon to the Bradford Royal Infirmary, died in the Hospital of St. John and St. Elizabeth in London on November 21 at the age of 75.

Basil Hughes was the son of Captain J. E. Hughes, R.N., and was born in the village of Hales, Staffordshire, on March 30, 1878. He was educated at Eastman's Royal Naval Academy and at Selwyn College, Cambridge, where he took the mathematical tripos in 1900. He was some time making up his mind about what career to take up, hesitating between music, veterinary science, and school teaching. In 1904 he graduated B.Sc. at London University. He then decided to study medicine, and he entered King's College Hospital Medical School with a Sambrooke scholarship. His student career continued as brilliantly as it had begun, for he was awarded the second-year medical student scholarship and the Jelf medal in 1906 and the Tanner prize and a senior scholarship two years later. He qualified in 1909, graduated M.B. at Cambridge in the following year, and took the F.R.C.S. in 1911. After holding the appointments of house-physician and house-surgeon at King's College Hospital, he became casualty officer at the Royal Free Hospital, house-surgeon at Paddington Green Children's Hospital, and clinical assistant at The Hospital for Sick Children, Great Ormond Street. He then moved to Yorkshire to become pathologist and resident surgical officer at the Bradford Royal Infirmary, an appointment he held from 1911 to 1913.

On the outbreak of war in 1914 Hughes left his newly established practice as a consulting surgeon to enter the R.A.M.C. as a lieutenant, becoming regimental medical officer, first, of the 6th battalion and then of the 5th battalion of the West Yorkshire Regiment. Later he served as a surgical specialist and finally as officer in charge of the surgical division of general hospitals in France and Salonika, attaining the rank of major. It was when he was in Salonika that he was called upon to operate on the Serbian Minister of War, who had a depressed fracture of the skull. Hughes was twice mentioned in dispatches, and in 1918 he was awarded the D.S.O. and the Serbian Order of St. Sava for his services. He made a great reputation as a military surgeon, for he was a rapid and gentle operator. Quick to point out the danger of underrating shock, he also took exceptional pains to maintain asepsis during the treatment and dressing of wounds.

After the war Hughes returned to Bradford, and in 1919 he was appointed honorary surgeon to the Children's Hospital and a surgical specialist under the Ministry of Pensions. Three years later, after his appointment as senior surgeon to the Bradford Municipal General Hospital, he was elected to the staff of the Bradford Royal Infirmary as assistant honorary surgeon. Later he became honorary consulting surgeon to both institutions. In the last war Hughes's experience in the treatment of wounds was invaluable, and from the time of the Dunkirk evacuation until the end of the war he operated on a large number of wounded men, many of whom were admitted to St. Luke's Hospital. In 1943 he was elected a founder fellow of the International College of Surgeons in recognition of

his standing as a surgeon and of his contribution on the classification of war wounds in the book *Surgery of Modern Warfare* (1941), edited by Mr. Hamilton Bailey. He was also a founder fellow of the Association of Surgeons of Great Britain and Ireland. His experiences in the war of 1914–18 provided him with the material for *War Surgery, from Firing Line to Base*, a book written in collaboration with Dr. H. Stanley Banks, who contributed the chapters on the bacteriological aspect of war surgery. Hughes was also a frequent contributor to the medical journals during the height of his career.

Relinquishing his hospital appointments in 1945, he retired to Cornwall, where, until he had a serious illness a year ago, he greatly enjoyed the management of his 56-acre farm at Par. He married Miss Norah Blayney, formerly well known as an actress, in 1932, and she survives him.

We are indebted to Mr. H. HAMILTON STEWART for the following appreciation: I had the good fortune, in my early days, to be assistant surgeon at the Bradford Royal Infirmary under Mr. Basil Hughes, and I shall always consider it a great privilege to have worked with him. He possessed a most colourful personality, due in part, no doubt, to his Welsh ancestry. He was a musician and a mathematician, and agriculture also interested him. After retiring from a very active life as a surgeon he took an agricultural course at Cambridge before he settled down to run his own farm in Cornwall. It must be rare for such diverse qualities to be present in any one man.

Hughes was cheerful and good-tempered, and he could often be heard coming along the corridors whistling a tune. He had at one time a great phase for "keeping himself alkaline," as he believed that this was necessary for good health. His lunch on a long operating day would consist of a plate of raw vegetables, which he would eat with apparent relish. He was very fond of driving in an open car even in the depths of winter, when most men after operating would have feared pneumonia. As a surgeon, he was indefatigable, and he was always alive to any advances. He did a great deal to enhance the prestige of Bradford as a surgical centre. Patients came from all parts of the country to be treated by him.

He was a most dexterous surgeon, with fine hands, and there were few in this country who were his equal in surgical technique. As a result of his experience as a children's surgeon he was an advocate of small incisions. I should say that one of the main reasons for his great success as a surgeon was his gentleness in handling human tissues. He will long be remembered by his friends and by his numerous patients.

Sir LANCELOT BARRINGTON-WARD

K.C.V.O., Ch.M., F.R.C.S., F.R.C.S.Ed.

A. J. M. B. writes: Sir Lancelot Barrington-Ward (whose obituary notice was published in last week's *Journal*) was senior surgeon of the Wood Green and Southgate Hospital for 18 years, and had been on the surgical staff for over 20 years before that. Those of us general practitioners who knew him there will always remember with affection his Wednesday visits. Exactly at 2.30 p.m. he would walk in briskly, his trim athletic figure reminding us of the days when he was a Rugby international and a redoubtable amateur boxer at Edinburgh University. Glancing at us with an expression that seemed to be an amusing blend of courtesy and raillery that seemed to bow deeply and ask, "What problems have you for me to-day?" He set himself a high standard of work and expected it from others. As a member of the staff once said, "When the chief arrives, this hospital springs to attention." It was certain that he commanded deep respect as well as affection. The hospital, though very small compared with the others which he attended, was in a sense one of his hobbies. He had watched its growth and develop-

ment with loving care, had acted as chairman of the hospital council for 13 years, and was ever ready to devote time to promoting the welfare of the patients and staff. Countless numbers of our patients in the district have good cause to be grateful for his wise advice and surgical skill; and we, his colleagues, mourn him as a friend and cherish his memory.

Dr. WILLIAM KERR RUSSELL, who died on November 5 after a prolonged period of ill-health, was born at Stewarton, Ayrshire, on April 12, 1874. Educated at Kilmarnock Academy and Glasgow High School, he graduated M.B., C.M. at Glasgow University in 1897. He settled in practice at Sunderland in 1899 and retired in 1948 on account of ill-health. He was a very active member of the B.M.A. and an ex-chairman of the Sunderland Division. He was also a founder member of the West End Medical Society and ex-chairman and member of the council of the Glasgow and Aberdeen North-eastern University Club. "Willie," as he was affectionately known to his colleagues, was a first-class example of the good family doctor of a previous generation. He was guide, philosopher, and friend to his patients and nothing was allowed to come between him and their welfare. A memorial service was held at Trinity and St. James's Presbyterian Church, where he had been an elder for 43 years.—J. S. M.

Medical Notes in Parliament

CLEAN FOOD BILL

The Food and Drugs (Amendment) Bill was given a second reading in the House of Lords on November 24.

Viscount WOOLTON, who moved it, said that its first main purpose was to ensure a higher standard of cleanliness in places where food was prepared or handled. Under Clause 6 the Ministers of Food and Health were given powers to make *ad hoc* regulations suited to the conditions of many different kinds of businesses and foods. A start would be made with new hygiene regulations, and after that would come registration of all premises where food was stored or handled, beginning with premises where food infection was most likely to occur, such as catering establishments. The second main purpose was to bring up to date the protection of the public against the use of substances and processes liable to render food injurious to health. It was sought to do this by preventing the addition of any substance to food, or the abstraction of any constituent, or the use of any treatment in preparing food, which made it injurious to health. The present law had proved inadequate, particularly in dealing with what was described as chronic toxicity. This was dealt with in Clause 5, which laid it down that the cumulative effect of additions or abstractions, or ingredients or processes, must be taken into account when the possibility of injury to health was being thought of.

The machinery by which the Bill's provisions would be put into effect would be, broadly speaking, by administrative control of standards of food hygiene and composition from the centre, by way of regulations, and it would then be for local authorities to execute and enforce these regulations. It was intended in due course to introduce a consolidating measure. Answering a point made by Lord Silkin, he stated that it was certainly intended that the Bill should cover restaurants.

Cleanliness in Restaurants

Lord WEBB-JOHNSON said it was fitting that a member of the medical profession should welcome the Bill, and it was gratifying that definite action was being proposed. The parts of the Bill that appealed to him were those that dealt with misleading advertisements and labels, those which imposed requirements, and those that were to regulate the addition of chemicals. He welcomed the assurance that

the Bill was to apply to restaurants. Clause 6 referred to the provision, maintenance, and cleanliness of sanitary and washing facilities, apparatus, furnishings, and utensils, but there was no reference to the personnel. It was extremely difficult to ensure that the workers would be clean, not only in themselves but in their clothing and so on, but it was a matter of first importance, and had been so treated in the Factory Acts. It had been suggested that the public could be a big controlling factor in imposing the adoption of cleanly methods in the serving of food. That was true, but the public were not particularly well informed on the statutory requirements, nor necessarily well educated in the correct way of handling food.

Lord HADEN-GUEST said that the Bill, with some amendments, would be a valuable safeguard of the national health. Not everything could be done directly by the drafting of the Bill, and it would be necessary to have more regulations, not fewer, to carry out its purpose, and they should be written in plain English so that they could be clearly understood. There was one point which he was not sure could be dealt with by regulations, although they could be made. In food shops and all places concerned with the distribution of food it was necessary to have a higher standard of personal cleanliness, and he believed that could come only from health education and training.

Lord SALTOUN gave some figures showing the extent of the habit of eating out, and the number of cases of food-poisoning. He quoted the Caterers' Association as stating that they sold some 10,000 million meals a year to the public, and the Ministry of Health Chief Medical Officer's analysis of the 255 outbreaks of food-poisoning that were traceable in the 21 months from April 1, 1950, to December 31, 1951—41 of them occurred in hotels, restaurants, and cafés, and 31 in works canteens. More recent figures for the first nine and a half months of this year showed that, out of 700 traceable outbreaks, 27 occurred in hotels, etc., and 17 in works canteens. Lord SEMPILL repeated Sir Edward Mellanby's criticisms about food manipulation and the use of agents in flour, and Viscount BLEDISLOE protested about the amount of advertising "booming" various foods and synthetic preparations as likely to enhance health or improve the general wellbeing.

Old-age Pensioners

Mr. R. H. TURTON, Parliamentary Secretary to the Ministry of Pensions and National Insurance, replying to a short debate on November 23 about the hardships of old-age pensioners, quoted the results of the national food surveys, which were instituted in 1951 and dealt with the calorie intake of the pensioners. Although the figures did not show a very bright picture, he said, they showed a considerable improvement. In January and February, 1951, the calorie intake was 7% below the requirements based on the B.M.A. scales. When the increase in retirement pensions was introduced last year the level rose to just over 100% of the B.M.A. requirements, and the most recent figures showed that for the first quarter of 1953 it was 4% over those requirements.

Fluoride Treatment of Teeth

Mr. WILLIAM ROSS on November 24 asked the Secretary of State for Scotland if he would state the areas in which an effort was being made to reduce dental decay by the application of solutions of sodium fluoride, and what knowledge had been gained from these efforts. Mr. J. STUART informed him that work of this kind had been carried out among schoolchildren in Dundee, Edinburgh, and Fife. While it promised to afford a measure of protection against dental decay, it would be some years before final conclusions could be drawn about its place in preventive dentistry.

Scottish Lunacy Laws

Mr. A. WOODBURN asked the Secretary of State for Scotland on November 26 whether he would make a further statement on the intentions of the Government to set up a

Royal Commission to consider and report on mental illness and deficiency in Scotland. Mr. J. STUART replied that the whole field was covered by the Committee on the Scottish Lunacy and Mental Deficiency Laws under the chairmanship of Lord Russell that reported in 1946. A further inquiry at this date was unnecessary, but he was considering the report and proposed in due course to lay a White Paper before Parliament as a basis for further discussion.

Fog Masks for Old People

Mr. B. TANNER asked the Minister of Health on November 26 whether, in view of the fact that most of the patients who would require masks as a protection from fog would be old people in the low income group, he would allow such masks to be issued free of any prescription charge. Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, said that there were no grounds which would justify drawing a distinction between masks and other necessary drugs and appliances prescribed by general practitioners. Where the charge could not be met without hardship the usual simple arrangements for securing a refund applied.

Tuberculosis Waiting-lists

Mr. IAIN MACLEOD, Minister of Health, stated in reply to Brigadier F. MEDLICOTT on November 26 that the numbers of patients suffering from tuberculosis who were on the waiting-lists for admission to hospitals were 9,378 at the end of 1950, 7,096 in 1951, and 6,126 in 1952.

Vaccination Among Immigrants

Mr. S. P. VANT asked the Minister of Health on November 27 whether entrants into Great Britain were asked to produce a certificate of vaccination against smallpox. Mr. IAIN MACLEOD said they were not normally, but if it was necessary to consider placing passengers from an infected area or craft under surveillance they might be asked whether they could produce evidence of recent vaccination.

Medico-Legal

ALLEGED FATAL BLOOD TRANSFUSION

Judgment was entered for the Southend Group Hospital Management Committee in the Queen's Bench Division on November 27 in an action in which it was alleged that the negligent administration of a blood transfusion at Southend General Hospital caused the death of a patient. On the third day of the trial, after hearing all the evidence, Mr. Justice Hilbery ruled that there was no case for the jury to consider.

The plaintiffs in the action were Mr. and Mrs. E. F. Webb, of Hadleigh, Essex. They claimed damages from the Management Committee in respect of the death at the hospital on November 21, 1951, of their son, Raymond L. Webb, aged 26. They alleged negligence by the house-surgeon, Dr. Joseph A. Ryan. It was stated that Dr. Ryan was not a defendant in the action, because he could not be traced. He was said to have returned to Canada, where he qualified. The Management Committee denied negligence, and pleaded further that Dr. Ryan was not their servant, although he was under contract to them at the time.

The plaintiffs contended that Dr. Ryan's only medical qualification was a degree obtained at Dalhousie, Nova Scotia, in May, 1951, and that he was not temporarily registered at the material time by the General Medical Council, and that he was not entitled to practise when he was appointed to his post at Southend General Hospital on August 18.

Raymond Webb entered hospital on October 28, 1951, and was successfully operated on for haemorrhoids on October 29. Between November 8 and 12 he had haemorrhages and was given blood transfusions. On November 18 the fourth blood transfusion was given, but was unsuccessful.

Rigor set in, accompanied by nausea and high temperature, and the transfusion was discontinued. On November 21, after the patient's reluctance had been overcome, he was given another transfusion. He reacted in the same way as on the 18th. By 5 p.m. his temperature rose to over 103° F. (39.4° C.) and his pulse became imperceptible. In spite of treatment he died at 8 p.m. A post-mortem examination showed death to have been caused by toxæmia, due to infected blood, and it was plaintiffs' case that the infection was introduced into their son's system during the transfusion.

Mr. F. R. Overend, assistant secretary of the General Medical Council, said in evidence that at the time Dr. Ryan was not registered, but agreed that temporary registration would have been granted if Dr. Ryan had asked for it. The fact that Dr. Ryan was not registered had nothing to do with his qualifications or ability.

Dr. J. W. Lacey, pathologist at St. John's Hospital, Chelmsford, giving evidence of a post-mortem examination of Raymond Webb, said that death was due to the presence in the blood stream of *Bacterium coli-aerogenes*. There was no question of the blood groups being incompatible. Given the circumstances of the patient's death, everything unquestionably pointed to the fact that the blood given in the transfusion of November 21 contained an enormous number of these organisms. He agreed that fatal reactions could be caused by the presence in the transfused blood of dead bacilli, which would be extremely difficult to detect. That could happen without negligence on anybody's part.

An Unhappy Chance

The case for the Management Committee was that the death of Raymond Webb was an unhappy chance—one of those rare cases where fatal reactions followed the transfusion of blood which was both sterile and compatible.

Mr. J. J. Shipman, who was senior surgical registrar at Southend General Hospital in 1951, said Dr. Ryan was a competent young surgeon and his ability in administering a blood transfusion was above the average. The witness said he ordered the transfusion on November 21, and he considered it a reasonable decision. The patient's haemoglobin content was only 44%.

Dr. W. D. Nicoll, senior registrar in the department of pathology at the hospital, said that the blood used on November 21 and on November 21 was compatible and sterile. The blood used on November 21 was checked again on November 22. It was compatible, but a culture taken from it developed a heavy growth of *Bacterium coli*. This he thought was due to the fact that the bottle had been left uncapped in the ward for several hours.

Dr. D. C. Caldwell, consultant pathologist at the hospital, said he was not surprised that Dr. Lacey had found infection in an examination carried out five days after death. He thought it likely that the infection stemmed from the site of the operation. Cross-examined, he agreed that something in the transfused blood caused the patient's death, but he did not agree that there was infection in the blood. He did not know what caused death.

Dr. G. Discombe, pathologist at the Central Middlesex Hospital, gave evidence that he agreed with the conclusions arrived at by Dr. Caldwell.

At the conclusion of evidence Mr. Justice Hilbery said there was "not a shadow of evidence" to support the allegations of negligence against the hospital. One allegation which he said should never have been made was that concerning Dr. Ryan's non-registration. Dr. Ryan was a young man with full and proper qualifications obtained in Canada. An allegation that the hospital was negligent in entrusting the blood transfusion to a young man recently qualified was absurd; particularly as he was said in evidence to have been exceptionally competent. People were not entitled to make charges of negligence and put them on the record of the court, without some evidence to support them, in the hope that they might be able to discover something to justify them. There was no evidence that the bottle in question had become infected because of the way it had been handled by Dr. Ryan or anyone else.

Saying there was no evidence on which the jury could find a verdict for the plaintiffs, he entered judgment for the defendants.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending November 14 (No. 45) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	26	1	5	1	1	27	1	14	0	1
Dysentery ..	370	47	243	1	2	213	24	109	1	2
Encephalitis, acute ..	0	0	0	0		6	0	0	1	
Enteric fever: Typhoid ..	1	0	0	1		4	0	1	15	
Paratyphoid ..	1	0	1	0		2	0	1 (B)	0	
Food-poisoning ..	164	18		0		110	7		0	
Infective enteritis or diarrhoea under 2 years ..					21	31			10	23
Measles*	816	24	37	14	80	11,264	989	155	21	139
Meningococcal infection ..	30	5	14	1	1	30	3	17	0	
Ophthalmia neonatorum ..	32	2	5	1	1	34	4	10	0	
Pneumonia†	534	41	171	5		502	33	282	8	
Poliomyelitis, acute: Paralytic ..	66	1	27	4	7	81	36	6	5	3
Non-paralytic ..	29	4				36	3			
Puerperal fever‡	246	27	12	1	1	211	23	12	0	2
Scarlet fever ..	1,400	96	217	37	51	1,976	166	381	22	115
Tuberculosis: Respiratory ..			146	20				124	19	
Non-respiratory ..			19	6				19	6	
Whooping-cough ..	2,410	126	285	53	60	1,449	80	74	28	108

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	2	0	0	0	0
Dysentery ..	0	0	1	0		0	0	0	0	
Encephalitis, acute ..	0	0	0	0		0	0	0	0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	10	0	1	1	2	7	1	1	0	2
Influenza ..	10	0	2	1	1	10	0	0	0	
Measles ..	0	0	0	0	0	0	0	0	0	
Meningococcal infection ..	0	1				0	2			
Pneumonia ..	209	27	20	6	4	176	35		5	5
Poliomyelitis, acute ..	6	0		0		2	0		0	
Scarlet fever ..	0	0	0	0	0	0	0	0	0	
Tuberculosis: Respiratory ..	96	10	8	3	1	117	10	9	1	3
Non-respiratory ..		2	1	2	2		3	2	0	3
Whooping-cough ..	4	0	0	0	0	1	1	1	0	0
Deaths 0-1 year ..	191	26	30	11	19	181	31	25	11	14
Deaths (excluding stillbirths) ..	5,269	695	575	133	169	4,803	693	469	100	164
LIVE BIRTHS ..	6,752	982	853	205	361	6,930	1058	760	207	402
STILLBIRTHS ..	205	18	25			185	13	23		

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

Vital Statistics

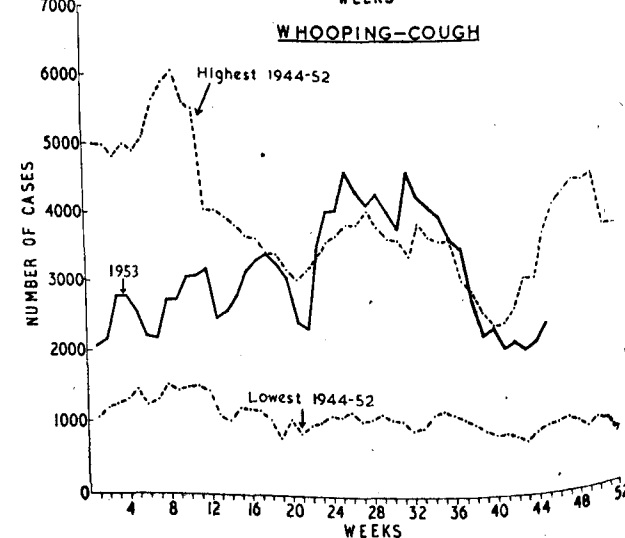
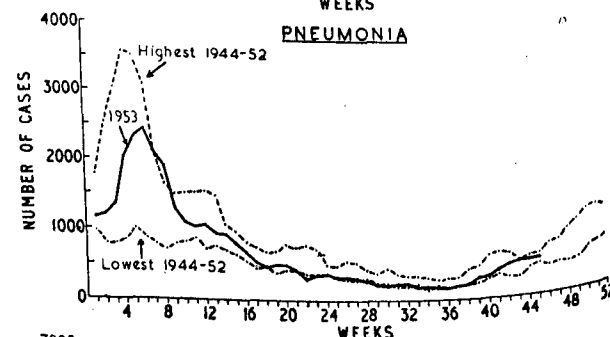
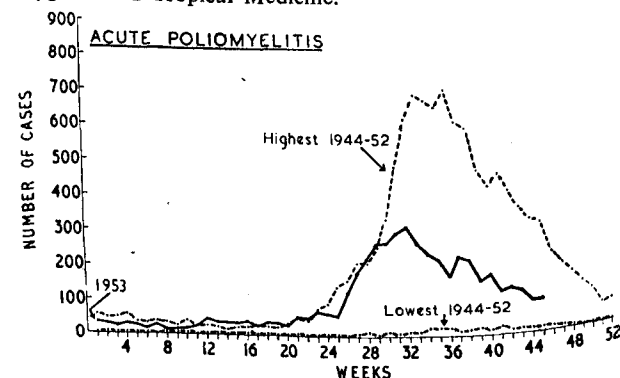
Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in October was 124, compared with 117 in the previous month and 116 (revised figure) in October, 1952.

The number of cases of industrial diseases in the United Kingdom reported during October was as follows: lead poisoning, 1; other poisoning, 13; anthrax, 3; epitheliomatous ulceration, 8; chrome ulceration, 13; total, 38. There were no deaths.—*Ministry of Labour Gazette*, November, 1953.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Medical News

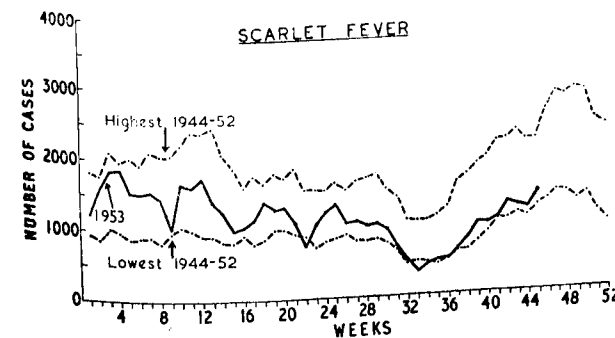
Royal Society.—Last Monday Dr. E. D. Adrian, O.M., delivered his presidential address to the Royal Society. The great volume of scientific publication nowadays made it difficult for him, he said, to pick out any one discovery for particular mention. "There has been great activity in many lines, but for the time being we seem to have passed the stage of really startling discoveries." In the most promising fields the general line of advance could be foreseen for a few years at least. It would be safe to expect, for instance, valuable developments in the fields of synthetic chemistry and in our understanding of the structure of proteins, the nature of viruses, and the action of enzymes. "But we are well prepared for them: they will not startle us unless they show some fault in the accepted theories." Dr. Adrian then spoke of some of the difficulties created by the rapid expansion of science. On the one hand, boundaries between different scientific disciplines were becoming blurred; on the other, new specialist groups were arising. Long ago it had passed the competence of one mind to keep the enormous territory of science in focus. At the close of his address Dr. Adrian alluded to the physical basis of memory. "We must start each morning with our brain structure modified by what happened to it the day before," he said. It was now possible to examine the reactions of a single nerve cell by thrusting a microelectrode into it, and the changes produced by repeated activity were being studied. However, the storage process might well involve a chemical as well as a physical reorganization. Evidence was accumulating that the transmission of signals from one cell to another depended on the release from the cell terminals of stimulating molecules and their rapid destruction by enzymes.

Scientific Exhibition.—At the B.M.A. Annual Meeting next year in Glasgow there will again be a scientific exhibition, open from July 5 to 9. This event proved very popular at the meetings at Dublin and Cardiff. To the exhibitor it offers unique opportunities of discussing his work with colleagues from at home and abroad. Medical research and current medical practice and techniques are suitable subjects for exhibition. Space is limited, so potential exhibitors are advised to apply for stands as soon as possible, and certainly not later than December 31. Full information and application forms can be obtained from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Air Attendants.—The St. John Ambulance Brigade can provide air attendants for patients travelling by air both in Britain and abroad. The attendants are qualified in air duties and emergency midwifery in addition to first aid and nursing. The service is voluntary, and the only payment is the attendant's fare and reasonable out-of-pocket expenses. All attendants are fully insured. At present this service is limited to British European Airways, but it is hoped to extend it soon to other air corporations. Applications for attendants should be made to the Officer in Charge of Register, St. John Ambulance Brigade Headquarters, 8, Grosvenor Crescent, London, S.W.1 (telephone, Sloane 9861). If special equipment is likely to be required the doctor should give warning of this beforehand.

Anglo-French Exchange Bursaries.—Applications are now invited for the bursaries which will be awarded in 1954 to young British doctors under the exchange scheme arranged by the French Embassy in London between the Institut National d'Hygiène in Paris and the Ciba Foundation in London. The value of the French grants is 60,000 francs a month, tax free, and they will be awarded for periods of two to four months to doctors who wish to obtain clinical experience or carry out medical research in France. Since the aim of the exchange is to spread in each country knowledge of achievements, outlook, and methods on the other side of the Channel, preference will normally go to candi-

SCARLET FEVER



Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending November 14 were increases of 235 for whooping-cough, from 2,175 to 2,410, and 213 for scarlet fever, from 1,187 to 1,400, and a decrease of 214 for measles, from 1,030 to 816.

The largest rises in the incidence of scarlet fever were 46 in Lancashire, from 165 to 211, and 38 in London, from 58 to 96. The largest fluctuations in the local returns of whooping-cough were rises of 76 in Yorkshire West Riding, from 195 to 271, 55 in Kent, from 43 to 98, and 55 in Norfolk, from 43 to 98, and falls of 49 in Staffordshire, from 125 to 76, and 33 in Surrey, from 91 to 58. The largest decreases in the number of notifications of measles were 79 in Cumberland, from 128 to 49, and 79 in Lancashire, from 248 to 169, while the largest increase was 34 in Staffordshire, from 88 to 122. 26 cases of diphtheria were notified during the week, being 8 more than in the previous week. The chief feature of the returns was a rise in Staffordshire from 5 to 13. 7 of the 13 cases were notified in Coseley U.D., where 7 cases were notified a fortnight earlier.

95 cases of acute poliomyelitis were notified. These were 6 more for paralytic and 5 fewer for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 12, Lancashire 11, Dorsetshire 7 (Wimborne and Cranborne R.D. 5), London 5, and Lincolnshire 5.

Notifications of dysentery numbered 370, and were 12 more than in the preceding week. The chief centres of infection were Yorkshire West Riding 98 (Bradford C.B. 60, Halifax C.B. 17), Yorkshire North Riding 18 (Middlesbrough C.B. 18), Lancashire 54 (Manchester C.B. 11, Bolton C.B. 9), London 47 (Islington 8), Middlesex 25 (Willesden M.B. 9), Warwickshire 17 (Birmingham C.B. 17), and Leicestershire 11 (Leicester C.B. 11).

In Scotland 105 cases of dysentery were notified in Glasgow and 37 in Edinburgh.

Week Ending November 21

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,613, whooping-cough 2,510, diphtheria 28, measles 793, dysentery 362, acute poliomyelitis 88, paratyphoid fever 9, and typhoid fever 2.

The Services

Surgeon Commander Robert M. Coplans, R.A.N., Officer in Charge of the Royal Australian Naval School of Air Medicine and Naval Specialist in Hygiene, has been appointed Honorary Physician to the Governor-General of Australia. Colonel P. R. Hawe, T.D., R.A.M.C., T.A., has been appointed Honorary Colonel of a Territorial Army Unit, in succession to Colonel J. P. Clarke, T.D., R.A.M.C., T.A., whose tenure has expired.

dates who are in teaching, or in posts where they can pass on the experience they have acquired. Application forms may be obtained from Dr. G. E. W. Wolstenholme, Ciba Foundation, 41, Portland Place, London, W.1. The closing date for applications is February 22, 1954.

Medical Artists.—The Medical Artists Association of Great Britain will shortly hold an examination of work submitted by those seeking membership. The last date for entries is January 30, 1954. Entry forms may be obtained from the honorary secretary, the Rotunda, the Radcliffe Infirmary, Oxford.

First-aid Resuscitation.—On the advice of the Medical Research Council, the mixture of oxygen and carbon dioxide formerly carried in local authority ambulances for first-aid resuscitation is now being replaced by pure oxygen.

Professor B. W. Windeyer has been appointed Dean of the Middlesex Hospital Medical School. Professor Windeyer graduated in Sydney, Australia, in 1927. Since 1942 he has occupied the London University Chair of Radiology (Therapeutic) at the Middlesex Hospital. He succeeds Sir Harold Boldero.

Miss Grace Hoare, personal assistant to the Editor of the *British Medical Journal*, has retired after 45 years' devoted service to three of the *Journal's* editors.

COMING EVENTS

The 10th International Congress of Medicine in Sport will take place in Belgrade from May 19 to 22, 1954. Further information may be obtained from Dr. Vojin Smolaka, Belgrade, Deligradska 27, Yugoslavia.

International Society of Orthopaedic Surgery and Traumatology.—The sixth congress of the International Society of Orthopaedic Surgery and Traumatology will be held in Berne, Switzerland, from August 30 to September 3, 1954. All correspondence should be addressed to the secretary-general of the Society, Mr. J. Delchef, M.D., 34, rue Montoyer, Brussels, Belgium.

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 37, No. 12) will be available in a week's time. The contents include: OCULAR COMPLICATIONS OF DIABETES MELLITUS. G. I. Scott. OCULAR COMPLICATIONS OF DIABETES MELLITUS. Leonard H. Howells. LENS EXTRACTION IN DIABETIC PATIENTS. A. B. Nutt. OCULAR MANIFESTATIONS IN LÖFFLER'S SYNDROME. D. M. J. Velzeboer. AMYOTROPHIC TEST IN PRIMARY GLAUCOMA. G. Cristini and N. Pagliarini. SMALL VOLUNTARY MOVEMENTS OF THE EYE. B. L. Ginsborg. SYMPATHETIC OPHTHALMIA FOLLOWING AN OPERATION FOR RETINAL DETACHMENT. Walter Kornbluth and Richard Stein. UNUSUAL CASE OF DOUBLE PRIMARY TUMOUR. Ida Mann, P. C. Yates, and J. P. Ainslie. THE LEGEND AND SHRINE OF SAINT TRIDUANA. John Foster.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, December 7

● HUNTERIAN SOCIETY.—At Talbot Restaurant, London Wall, E.C., 7 for 7.30 p.m., dinner meeting. Discussion: A Pain in the Neck, to be opened by Dr. J. W. Aldren Turner and Mr. H. Osmond-Clarke. ● POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor A. Haddow: Recent Trends in the Experimental Pathology of Cancer. ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: The "Refraction Case." Six Factors Producing Good Sight. ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—5 p.m., First Harben Lecture by Sir Henry Dale, O.M., F.R.S.: Changes and Prospects in Medicinal Treatment (illustrated). UNIVERSITY COLLEGE, LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., public lecture by Dr. H. Gutfreund: Molecular Forces in Protein Solutions—(1) Molecular Interaction in Protein Solutions.

Tuesday, December 8

CHelsea CLINICAL SOCIETY.—At South Kensington Hotel, 7.30 p.m., dinner, followed by a discussion: Dictators and Their Doctors, to be opened by Mr. A. Dickson Wright. INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. D. Samman: Reticulosis. LONDON UNIVERSITY.—At Anatomy Lecture Theatre, University College, 5.30 p.m., Special University Lecture in Psychology by Professor Otto Koehler (Freiburg): Thinking Without Words. Illustrated with lantern slides and films.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., FitzPatrick Lecture by Dr. Maurice Davidson: Medicine in Oxford, A Historical Romance: From the Laudian Code (A.D. 1636) to the Early XIXth Century. ROYAL EYE HOSPITAL.—5 p.m., Professor Arnold Sorsby: Nature of Congenital Anomalies. ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—5 p.m., Second Harben Lecture by Sir Henry Dale, O.M., F.R.S.: Changes and Prospects in Medicinal Treatment (illustrated). ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Mr. Aleck W. Bourne: Non-malignant Conditions of the Cervix. WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Mr. I. R. McCaul: Investigation of Cerebral Tumour.

Wednesday, December 9

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Reticulosis. INSTITUTE OF NEUROLOGY.—5 p.m., Dr. H. Hecan (Paris): The Ballet's Syndrome and its Minor Forms. INSTITUTE OF PSYCHIATRY.—At Maudsley Hospital, 5.30 p.m., public lecture by Dr. Eliot Slater: The M'Naghten Rules and Modern Concepts of Responsibility. INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. G. Sandrey: Urological Emergencies in General Practice. LIVERPOOL MEDICAL INSTITUTION.—At Liverpool Royal Infirmary, 3 p.m., clinical meeting. POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor G. MacG. Bull: Tests of Renal Function. ROYAL COLLEGE OF SURGEONS OF ENGLAND.—4 p.m., Bradshaw Lecture by Sir Reginald Watson-Jones: Fracture Treatment in the Next Half Century. ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—5 p.m., Third Harben Lecture by Sir Henry Dale, O.M., F.R.S.: Changes and Prospects in Medicinal Treatment (illustrated). ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., lecture-demonstration by Dr. J. D. W. Pearce: Psychological Medicine. SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP: NUTRITION PANEL.—At Medical Society of London, 6.30 p.m., Dr. R. Passmore: Some Recent Investigations of Human Calorie Requirements.

Thursday, December 10

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, London, W., 8 p.m., Dr. L. P. E. Laurent: Psychosomatic Effects of Obesity. ● INSTITUTE OF CARDIOLOGY National Heart Hospital.—9.30 a.m., Dr. Maurice Sokolow (California): Quinidine. ● INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY.—At National Hospital, Queen Square, W.C.1, 5.30 p.m., Dr. B. H. Kirman: Epilepsy and Paralytic Syndromes. INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Superficial Fungus Infections of the Skin. PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—7.30 p.m., Professor A. A. Miles: Biological Standards. POSTGRADUATE MEDICAL SCHOOL OF LONDON.—3.30 p.m., Professor G. MacG. Bull: Tests of Renal Function. ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. J. S. Wilson: Work of the Public Health Laboratory Service. ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., FitzPatrick Lecture by Dr. Maurice Davidson: Medicine in Oxford, A Historical Romance: From the Early XIXth Century to A.D. 1914. Epilogue. ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Robert Jones Lecture by Mr. St. J. D. Buxton: Arthroplasty. ROYAL SOCIETY.—4.30 p.m., Sir Francis Walshe, F.R.S.: The Contribution of Clinical Observation to Cerebral Physiology. ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., Dr. Henry Foy: Influence of the Intestinal Flora on the Synthesis of Haemopoietic Factors in the Megaloblastic Anaemia of Africans. ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. C. M. Fletcher: Observer Error in Clinical Medicine. ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Sir Paul Maltinson: psychiatry demonstration.

Friday, December 11

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. D. Samman: Reticulosis. OSLER CLUB OF LONDON.—At 11, Chandos Street, W., 7.45 p.m., Dr. Leonard Colebrook, F.R.S.: Emile Roux (December 17, 1853-1933). POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4.30 p.m., Professor G. MacG. Bull: Tests of Renal Function. ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Symposium: Nephritis. SOCIETY OF PUBLIC ANALYSTS: BIOLOGICAL METHODS GROUP.—At Anatomy Lecture Theatre, University College, 2.30 p.m., joint meeting with Pharmaceutical Society. Symposium on The Assay and Detection of Pyrogens. Papers by Mr. T. D. Whittet, B.Sc., Ph.C., Mr. K. L. Smith, M.P.S., and Mr. M. Dawson, Ph.C., and Professor J. P. Todd, Ph.D., Ph.C., F.R.I.C.

Saturday, December 12

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, London Hospital Medical College, 11 a.m., 324th meeting. Scientific papers. SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At King's College Hospital Medical School, 10.30 for 11 a.m., annual meeting. Demonstration by Dr. Clifford Hoyle: Sarcoidosis—assisted by Dr. John Dawson and Dr. Gordon Mather.

APPOINTMENTS

ABSE, DAVID WILFRED, M.D., D.P.M., Full-time Associate Professor of Psychiatry, the School of Medicine, University of North Carolina, Chapel Hill, North Carolina, U.S.A. EAST ANGLIAN REGIONAL HOSPITAL BOARD.—Pamela M. Hellings, M.B., Ch.B., D.A., Anaesthetic Registrar at United Norwich Hospitals; J. G. Weir, M.B., Ch.B., Registrar in Psychiatry, Addenbrooke's Hospital and Fulbourn Hospital. EVANS, RICHARD GERWYN, M.B., B.Ch., C.P.H., Assistant Medical Officer of Health, Breconshire County Council. HIRD, GORDON, M.B., Ch.B., D.P.H., Assistant County Medical Officer of Health, Warwickshire. HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—H. E. Lockhart-Mummery, M.Chir., F.R.C.S., Part-time Senior Surgical Registrar; Doreen P. Pallot, M.B., B.S., D.A., Resident Anaesthetic Registrar; Josephine J. Candy, M.B., B.Ch., and Marion R. MacKay, M.B., B.Ch., Junior Resident Anaesthetists; N. J. Rotfield, M.B., B.S., D.C.H.

Any Questions?

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

Frequent Defaecation

Q.—A 40-year-old married man complains of symptoms which point to an unusually sensitive colon. Certain foods and drinks cause distressing frequent defaecation. Among these are oatmeal, yeast extracts, malt, treacle, beer, and stout. These articles of diet do not in ordinary quantities produce loose stools, but they cause him to have anything from eight to twelve apparently normal motions a day. The complaint has troubled him since about the age of 18 years. What is the explanation of these symptoms?

A.—The symptomatology described might have either a psychological or an organic basis. In either case, the simplest and best treatment would seem to be the avoidance of the offending articles of diet, provided that this does not lead to nutritional inadequacy. If it should be found impracticable, or deleterious to health, to restrict the diet in the way required, fuller investigation of the case is essential. If an organic basis can be clearly demonstrated—such as protein allergy, or inadequate digestion or absorption of some food material—appropriate corrective treatment should be instituted. If, however, no organic basis can be found, the advisability of psychotherapy must be considered.

When dietary restriction is practised, it is a good thing to examine the actual food intake quantitatively and in some detail; any likely deficiencies can then be corrected by appropriate supplementation.

Von Recklinghausen's Disease

Q.—Have there been any recent advances in the treatment of von Recklinghausen's disease? Is it possible to form any estimate of the likely rate of progression in an individual case?

A.—There have been no recent advances in the treatment of generalized neurofibromatosis (von Recklinghausen's disease). There are no special features which enable an estimate of the progression of the disease to be made.

Sedimentation Rate in Subacute Rheumatism

Q.—How reliable is the erythrocyte sedimentation rate as an index of activity in subacute rheumatism?

A.—The erythrocyte sedimentation rate is a valuable index of activity in subacute rheumatic fever, but, like all laboratory tests, it is not as reliable as clinical signs. It is seldom normal in the presence of physical signs. It may, however, be abnormally raised in the absence of clinical signs of rheumatic activity. In those circumstances it should be regarded as indicating a subclinical inflammatory process. Since in rheumatic fever the heart should be rested until all activity has subsided, it would be unwise to allow such patients to get up until the sedimentation rate has been within normal limits for at least 2-4 weeks, depending on whether the heart has previously been damaged. If there has been carditis in the acute attack, 4 weeks of bed rest, or sometimes even longer, is indicated after the erythrocyte sedimentation rate has become normal. The only exception to this generalization is in older girls, aged 14-20. In this age group sedimentation rates may remain high (say, 20-30 mm. per hour) for prolonged periods, often increasing at the menses, without any physical signs of activity or any adverse effects after letting the patient get up. It should be remembered that the erythrocyte sedimentation rate is a non-specific response and depends upon the presence in the body somewhere of an inflammatory process or tissue destruction, both of which lead to increased fibrinogen in

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Clements.—On November 21, 1953, at Poole, Dorset, to Sheila Mayer, wife of Dr. P. W. Clements, a daughter—Gillian Jane. Gribble.—On November 28, 1953, at The London Hospital, London, E., to Mary (formerly Watkins), wife of Michael Gribble, B.M., B.Ch., a son—Julian de Gruchy. Marley.—On November 30, 1953, at Cobden Hill House, Radlett, Herts, to Daphne (formerly Garrod), wife of Reginald S. Marley, M.S., F.R.C.S., a sister for Susan, Jennifer, David, and Gavin—Hilary.

MARRIAGES

Bird.—Batemans.—On November 21, 1953, at Christ Church, Fulwood, Sheffield, Julian Davis Bird, M.B., Ch.B., D.A., to Nora Bateman, S.R.N., S.C.M. Bowie.—Whitfield.—On November 20, 1953, in London, William Wilson Bowie, M.B., Ch.B., D.Obst.R.C.O.G., to Enid Mary Whitfield, M.B., Ch.B., D.C.H.

DEATHS

Arthur.—On November 17, 1953, at Llandrindod Wells, Radnorshire, William Daniel Arthur, M.B.E., M.R.C.S., L.R.C.P., Colonel, late R.A.M.C., retired, of Llandaff, Cardiff. Beetham.—On November 20, 1953, in hospital, Herbert William Beetham, L.R.C.P.&S.Ed., L.R.F.P.S., of 6, Lidgett Park Road, Leeds, Yorks, aged 46. Ealand.—On November 11, 1953, Ralph Martin Ealand, M.R.C.S., L.R.C.P., late of Bathaston, Somerset. Edmon.—On November 6, 1953, at the Grove Hospital, Tooting, London, S.W., Joseph Bramhall Edmon, M.D., D.P.H. Hareley.—On November 6, 1953, at his home, 71, Lichfield Road, Sutton Coldfield, War, George Cleverdon Hareley, M.C., M.B., Ch.B., husband of Alice Muriel Hareley, M.B., Ch.B., formerly of Erdington, Birmingham, aged 66. Hatch.—On November 16, 1953, Herbert Lincoln Hatch, M.B., B.S., D.P.H., of Pinner, Middlesex. Henderson.—On November 14, 1953, at Bexhill-on-Sea, Sussex, Henry John Henderson, M.C., M.B., B.S., formerly of Amersham, Bucks. Johnson.—On November 17, 1953, at Nearfield House, Bawtry, Yorks, Frederick Johnson, O.B.E., M.B., Ch.B., aged 77. Latham.—On November 3, 1953, at 8, Ravenslea Road, Wandsworth Common, London, S.W., Donald Victor Latham, M.D., M.A.O., D.Obst.R.C.O.G., late of Grahamstown, South Africa, and Dar-es-Salaam, Tanganyika Territory, aged 56. Lee.—On November 17, 1953, at 8, Glebe Road, Worthing, Sussex, Clifford Harry Lee, M.R.C.S., L.R.C.P., aged 57. Macpherson.—On November 14, 1953, Charles Wattie Macpherson, M.B., Ch.B., of 277, Bramhall Lane South, Bramhall, Cheshire. Nicholson.—On November 10, 1953, at Fairings, Fitchampstead, Berks, Frederick Dering Nicholson, M.D. Poole.—On November 11, 1953, at his home, 29, Balcombe Road, Horley, Surrey, Arthur Henry Poole, M.D., aged 86. Price.—On October 30, 1953, at his home, 315, Sheen Road, Richmond, Surrey, Lorenz Arthur Price, I.S.O., L.R.C.P.&S.Ed., formerly of Colombo, Ceylon. Robson.—On November 10, 1953, at Dar-es-Salaam, Tanganyika Territory, Thomas William Robson, M.R.C.S., L.R.C.P., formerly of Hazel Grove, Cheshire, aged 37. Stone.—On November 9, 1953, at 30, Foxley Hill Road, Purley, Surrey, Ernest Richard Stone, M.B., B.Ch., D.T.M. Woodwright.—On November 13, 1953, at his home, The Grove, Branksome Park, Bournemouth, Hants, William Henry Edward Woodwright, F.R.C.S.I., Lieutenant Colonel I.M.S., retired.

the plasma. The Wintrobe method sometimes gives anomalous results (readings which appear normal even with marked clinical signs of activity) and it is better to use the Westergren method, which gives readings more generally in accord with the clinical state.

Chapped Hands

Q.—What is the most satisfactory treatment of the chapped hands so frequently seen in diabetics? As this condition is associated with cold weather, would the dry, cold climate of Alberta (Canada) aggravate the condition further?

A.—The use of glycerin and rose water or some hand lotion containing glycerin is the most satisfactory treatment for chapping.

The condition appears to be dependent essentially upon the humidity of the atmosphere, which in cold weather is usually low. It is aggravated by winds, especially drying winds, usually from north and east, and by irritants such as soap and alkalis. If the humidity is low (indicated by a low dew-point) in Alberta, especially in cold weather, as seems probable, it would tend to provoke chapping.

Spasmodic Torticollis

Q.—What treatment is advised for the spasms in a case of chronic spasmodic torticollis?

A.—Spasmodic torticollis is most resistant to treatment. Medicinal treatment is of little value. Relaxation exercises and extension of the neck may be of temporary help. Immobilization of the cervical spine in plaster or in a plastic collar is often the most useful measure, though obviously in no way dealing with the unknown cause of the condition. Operative measures, in particular division of the upper cervical anterior roots, have been resorted to in some cases, but the results are by no means uniformly successful.

Switzerland for the Asthmatic

Q.—What special advantages can Switzerland offer to asthmatic patients that are not available in Britain? Are any special types of asthmatic patient particularly likely to benefit from going there?

A.—Switzerland has many obvious attractions for the British, but the particular advantage which it has to offer Britain's asthmatic patients is a climate far less conducive to infective changes in the respiratory tract. The death rate from bronchitis in England and Wales is 63.5 per 100,000 of the living population, while for Switzerland the figure is 6.8. The death rate from asthma in England and Wales is 7.0 per 100,000 and for Switzerland it is 4.2.

Changes of environment are known to benefit asthma when unsuspected allergens are thereby removed, when the psychological factors, also often unsuspected, are eliminated, or when the climate benefits the infective factor in asthma. All three types of asthma might indeed benefit by removal to Switzerland, but it is only for the infective type that one might claim that Switzerland, owing to its dry and warm climate, was particularly likely to result in improvement.

There is no reliable information whether asthmatic children do, in fact, do better in Switzerland than in Britain, and so far as the writer knows there are no means of getting asthmatic children to Switzerland on medical grounds to any form of institution. There is certainly no official scheme.

Tuberculosis in Paediatric Wards

Q.—Should cases of tuberculous meningitis and military tuberculosis be treated in a children's ward? Is it safe to admit suspected cases of pulmonary tuberculosis to the ward, provided any found to be open are isolated at once?

A.—If separate accommodation is available it is probably best not to treat cases of tuberculous meningitis and military tuberculosis in children's wards. Cases of tuberculous meningitis in particular are often exceedingly ill, and

the meningitic cry may be very distressing to other patients. However, there is probably little risk of infection of other children as long as the patient does not have an adult type of pulmonary tuberculosis. Primary tuberculosis in children can be regarded for practical purposes as non-infective, although if such cases are treated in a ward with other children simple precautions should be observed, such as having separate crockery and linen.

Children with the adult type of pulmonary tuberculosis, with cavitation, should, of course, be excluded if possible, and isolated at once if they are diagnosed in the ward.

Lysozyme

Q.—Is the antibacterial action of lysozyme in tears in any way comparable to that of the antibiotics? Has lysozyme any therapeutic possibilities?

A.—Lysozyme was first isolated by Sir Alexander Fleming in 1922 in the secretion of the nasal mucosa. Subsequently it was found to be particularly plentiful in tears, but it is present also in many other tissues. Its antibacterial effect constitutes one of the defensive mechanisms of the body. The action of lysozyme is comparable to the antibiotics only because it is one of the many naturally occurring agents against bacteria. Its therapeutic efficacy is, however, low.

B.C.G. During Diphtheria-pertussis Immunization

Q.—Would it be inadvisable to Mantoux test and give B.C.G. vaccination to a healthy child aged 16 months while he is undergoing immunization with a combined diphtheria-pertussis vaccine? The B.C.G. vaccination team will be in this district shortly, and I would like to know what to do.

A.—This is a case where recommended procedure will depend to some extent on the child's environment. If it is known that the parents and other intimate contacts of the child are not suffering from open tuberculosis, and that the home and environmental conditions are such that the child is unlikely to be exposed to the risk of tuberculous infection, tuberculin testing and B.C.G. vaccination would not be regarded as an urgent measure. If, on the other hand, the chances of the child being exposed to tuberculosis are uncertain, it would be wise to test and vaccinate now when the opportunity presents, since the child is still at an age when tuberculous infection could be serious. Inoculation with the combined diphtheria-pertussis mixture, if it does not contain alum, is unlikely to cause much local or systemic reaction, and ordinarily there would be no contraindication to B.C.G. vaccination during the course of the other immunizations. If need be, the last injection of the combined prophylactic could be deferred for another month or more; and even if the B.C.G. vaccination is not done now it would be useful, and perfectly safe, to have the child tuberculin tested for future reference.

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

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STUDIES ON PANCREATITIS*

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AND
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In the same year as von Mering and Minkowski (1889) produced experimental diabetes in dogs by ligating the pancreatic duct, Fitz (1889), of Boston, described a case of "acute catastrophic inflammation of the pancreas." It is a regrettable fact that, 63 years later, the knowledge of exocrine and endocrine physiology of the gland, based on the brilliant work of Pavlov (1902), Bayliss and Starling (1902), and Banting and Best (1921-2), far outstrips the understanding of the clinical entities of pancreatitis. There are several reasons why this should be so: in the first place, pancreatitis is often difficult to diagnose, for the most suggestive symptom—pain—is variable both in site and in intensity, and is closely mimicked by other intra-abdominal conditions; secondly, diagnostic laboratory tests are by no means infallible; and, finally, little is known of the pathology of pancreatitis.

Acute and chronic pancreatitis have long been regarded as separate clinical and pathological entities, the one presenting as an acute abdominal emergency, and the other as a rare cause of abdominal pain, obstructive jaundice, wasting, steatorrhoea, or diabetes mellitus. Comfort *et al.* (1946) have established a link between acute and chronic pancreatitis in their now classical description of "chronic relapsing pancreatitis." Not the least important part of their work was to draw attention to the aetiological significance of alcoholism.

The publication of several reviews on acute pancreatitis (Paxton and Payne, 1948; Warren, 1948; Lipp and Aaron, 1950; Roberts *et al.*, 1950), on subacute pancreatitis (Gray *et al.*, 1938; Macnab, 1949), and on chronic relapsing pancreatitis (Maimon *et al.*, 1948; King, 1949; Gambill, 1949) indicates the amount of contemporary interest in the subject. In Australia, Rose (1951) and Heinz (1952) have reviewed experience in Sydney and Melbourne. While these statistical surveys provide an important overall picture of the incidence and complications of pancreatitis, they are less helpful with regard to information on pathogenesis and individual clinical patterns.

The present work was undertaken, (1) to investigate the clinical features of acute and chronic pancreatitis;

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(2) to elucidate some of the aetiological factors involved; (3) to study possible associated disturbances in gastric and hepatic function; (4) to evaluate laboratory tests as aids to diagnosis; and (5) to clarify the position with respect to treatment.

Between October, 1951, and July, 1952, 24 cases of acute and chronic pancreatitis were studied.

Methods of Study

In addition to full clinical examination, diet histories were taken by Miss C. N. Turner (dietitian at the Clinical Research Unit of the Walter and Eliza Hall Institute of Medical Research and Royal Melbourne Hospital). The following investigations were also made:

(1) *Estimation of urinary diastase*, using Dodds's modification of Wohlgemuth's method (Dodds and Dickens, 1925), was carried out during attacks of pain.

(2) *Intravenous Secretin Test*.—The method of Dornberger *et al.* (1948), based on the original studies of Agren *et al.* (1936), was closely followed. A double lumen tube was swallowed by the patient in the fasting state. The progress of the tip of the tube into the duodenum was followed fluoroscopically. Gastric contents were aspirated by Wangenstein suction and the duodenal contents were collected in 30-ml. test-tubes under slight negative pressure (estimated at 20 mm. Hg). After two ten-minute samples of fasting duodenal content had been aspirated, Wyeth's secretin was given intravenously, in a dosage of 1 unit per kg. body weight. The total volume and the bicarbonate content of each sample, estimated by the titrimetric method of Van Slyke, were recorded.

(3) *Gastric Function*.—A histamine test meal was done on most patients, many of whom also had gastric biopsy performed.

(4) *Liver Function*.—Estimation of serum bilirubin, alkaline phosphatase, serum proteins, and the cephalin-flocculation test was performed on most patients. A few also had a liver biopsy done.

(5) *Oral Sugar Tolerance Test*.

(6) *Gelatin Absorption Test*.—This test of protein digestion, based on a technique described by Krauel (1944), was performed on four patients. Gelatin, 50 g., was given orally, and the level of the serum amino-nitrogen was followed at hourly intervals for five hours.

(7) *Radiological Studies*.—Plain x-ray films of the pancreatic area and barium meal x-ray films were taken in most patients, and where cholecystectomy had not previously been performed a cholecystogram was done.

Acute Pancreatitis

Eleven cases of acute pancreatitis were studied. The age and sex incidence of patients is shown in Fig. 1. In 10 of these cases the diagnosis was made either on clinical grounds or at laparotomy, but in one case severe pancreatitis was an unsuspected and surprising finding at necropsy. Two of these patients died.

Pain and persistent vomiting were the most frequently presenting symptoms. The pain was felt in the epigastrium and radiated to the right and left hypochondrium, and through to the back at the level of the twelfth dorsal to the second lumbar vertebrae. The quality and intensity of the pain were rarely, however, of great diagnostic value: in two patients right-sided localization closely simulated

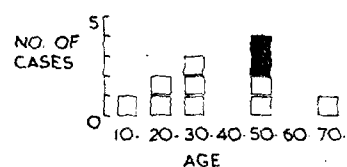


Fig. 1.—Age and sex distribution of 11 cases of acute pancreatitis. White squares, males; black squares, females.

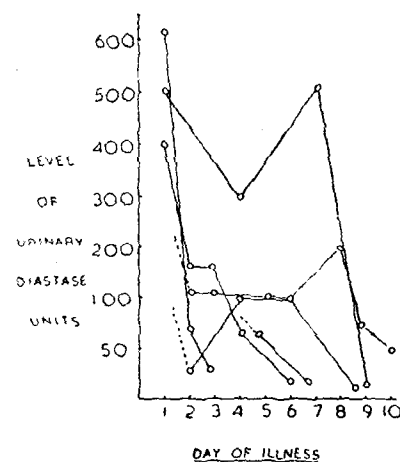


Fig. 2.—Serial urinary diastase levels in six cases of acute pancreatitis.

pain. Biochemical tests showed this to be of obstructive type. Transient glycosuria was noted in two cases within 48 hours of onset, and in one fatal case acute diabetic coma developed five days after the onset of symptoms.

Estimation of the urinary diastase was of great help in the differential diagnosis of pancreatitis from other acute abdominal conditions. A level of over 100 units is diagnostic of pancreatitis. Although moderate elevation of the urinary diastase has been observed in some cases of perforated peptic ulcer, the significantly high levels, 400–1,000 units, which at times are found in patients with acute pancreatic necrosis should guide the surgeon in this often difficult clinical problem. Serial diastase levels in six cases are shown in Fig. 2. It will be seen that there is a tendency for the diastase to fall to normal levels within two to five days after the onset of pain. Estimation of the urinary diastase test is therefore of real value only if it is done soon after the onset of pain.

Aetiology

Cases fell into three aetiological groups: (1) associated with gall-stones; (2) associated with alcoholism; and (3) apparently due to primary infection.

(1) *Cholelithiasis* (three cases).—Halsted (1901) and Opie (1901) were the first to point out the association of pancreatitis with a calculus obstructing the ampulla of Vater. In

most reviews on acute pancreatitis, gall-stones have been present in 50–80% of patients. In the present limited series of cases the relatively few patients with proved gall-stones is quite a striking feature.

In one patient it was possible to obtain useful correlation between the clinical features and the histological findings in both the liver and the pancreas.

A 73-year-old man with hypertensive vascular disease developed acute abdominal pain and vomiting, and became slightly jaundiced. Laparotomy was performed. The head of the pancreas was swollen and indurated. Material was obtained from this site with a liver biopsy needle; and liver tissue was also taken for section. Cholecystenterostomy was performed. The pancreas showed acute inflammatory changes (Fig. 3), and in the liver severe cholangitis was present.

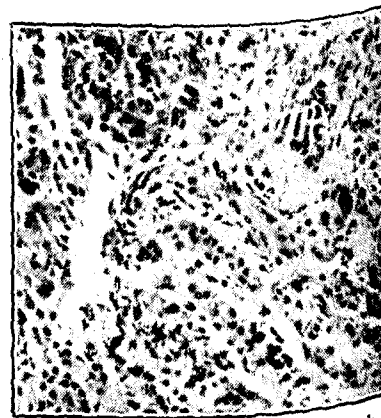


Fig. 3.—Section of pancreatic tissue obtained by means of an aspiration liver biopsy needle at laparotomy in a man with pancreatitis complicating cholelithiasis, showing acute interstitial inflammatory changes. (Haematoxylin and eosin. $\times 150$.)



Fig. 4.—Section of pancreas showing acute necrosis in a woman dying of acute infectious hepatitis.

(2) *Alcoholism* (five cases).—Many early writers—for example, Egda (1907)—noted that acute pancreatitis often followed a bout of heavy drinking. Five of the patients under review were exceptionally heavy beer or spirit drinkers, but in none of them was there any evidence of biliary disease. It is of possible significance that all of them had arterial hypertension. In three patients pain followed a bout of heavy drinking.

In February, 1952, a 32-year-old man had severe abdominal pain after a drinking bout. His urinary diastase was 400 units. Five days after admission he lapsed into diabetic coma. He improved with insulin but died two days later from bilateral bronchopneumonia. At necropsy severe pancreatic necrosis was found. The common bile duct and gall-bladder were normal. It is of great interest that an identical twin brother of this patient also had severe pancreatic necrosis, from which he recovered, in 1949.

Two patients had recurring attacks of abdominal pain related to alcoholic episodes. That pancreatitis of this nature is primarily a medical rather than a surgical problem is indicated by the fact that recurrence of pain in these two patients ceased in a period of nine months' observation when they stopped drinking and were able to eat good diets.

(3) *Infection* (two cases).—Certain viruses are known to cause acute pancreatic inflammation. Mumps is the classical example, of which there was one instance in this series. Poppel and Berrow (1949) noted symptoms referable to pancreatitis in no fewer than 17 of a series of 95 cases of mumps. Since both mumps orchitis and meningo-encephalitis without parotitis are known to occur, it is conceivable that occasional obscure cases of pancreatitis may be due to infection with the mumps virus, without demonstrable enlargement of the parotid glands.

Pancreatitis is occasionally an associated condition in severe cases of infectious hepatitis (Lucké, 1944).

A middle-aged woman developed classical signs and symptoms of infectious hepatitis and died in hepatic coma. At necropsy widespread necrosis of the liver cells was found, and the pancreas showed necrotic changes (Fig. 4).

Transient elevation of the urinary diastase has been noted in several cases of acute infectious hepatitis of moderate severity; it is possible that mild pancreatitis may be a common complication of infectious hepatitis.

A strain of Coxsackie virus pathogenic to man is known to cause acute pancreatitis in suckling mice (Pappenheimer *et al.*, 1951), but so far pancreatitis attributable to this virus has not been recognized clinically.

Treatment

The diagnosis of acute pancreatitis may present considerable difficulty, and if an occasional laparotomy is needlessly performed little harm to the patient is likely to follow. Nevertheless, if the diagnosis of acute pancreatitis can be assured conservative treatment is urged.

Pain was satisfactorily controlled with pethidine. Morphine may actually aggravate pancreatic pain.

Continuous gastric aspiration was applied until pain and vomiting ceased. Aspiration of gastric juice prevents vomiting and inhibits the hormonal stimulation of the flow of pancreatic juice.

Loss of electrolytes necessitated accurate replacement with intravenous glucose-saline and potassium chloride. Edmondson *et al.* (1952) and Roberts *et al.* (1950) have drawn attention to the dangerous degree of hypochloreaemia and hypokalaemia which may occur in pancreatic necrosis; and a factor which the former authors show to have been hitherto neglected is the binding of calcium when fat necrosis is extensive, indicating that intravenous injections of calcium gluconate should be given in severe cases.

Although acute diabetes is a rare complication, the urine and blood sugar should be repeatedly estimated and insulin given when necessary.

Secondary infection is a threat to life in acute pancreatic necrosis. Therefore penicillin (500,000 units six-hourly) and streptomycin (0.5 g. twice daily) were given to all cases.

In cases in which clinical or radiological evidence pointed to cholelithiasis elective cholecystectomy was performed after the attack of pancreatitis had subsided.

Chronic Pancreatitis
Chronic pancreatitis is in some respects a misnomer, for the

natural history of the majority of the 15 patients studied (see Fig. 5) pointed to a relapsing, recrudescing form of disease. The pathology which was observed in patients on whom operation was performed during attacks of pain was that of oedema or haemorrhagic necrosis of the gland. In several patients these repeated attacks had ultimately caused destruction of the acinar and islet tissue, with fibrosis and even calcification, leading to deficiency of both internal and external secretion.

The clinical history of four male patients closely resembled the description of chronic relapsing pancreatitis given by Comfort *et al.* (1946). Another syndrome was that observed in eight female patients who had attacks of pancreatitis following cholecystectomy. The remaining three patients formed a miscellaneous group.

Chronic Relapsing Pancreatitis

All four patients were males. Three of them had essential hypertension; three had been heavy consumers of alcohol. Three patients had a laparotomy performed at one time or another, and, although pancreatitis was noted, there was no evidence of associated biliary disease.

The initial manifestation of the disease was that of recurring attacks of abdominal pain, during which the urinary diastase was raised. In one patient only a few weeks intervened between attacks of pain, but in the remainder several months of freedom from pain were enjoyed. Sometimes a distressing feature was that pain persisted despite a variety of operations undertaken on the biliary tract.

A 51-year-old man, once a heavy beer-drinker, had been admitted to hospital on 16 occasions between 1944 and 1951 with attacks of pancreatic pain. In 1944 his gall-bladder had been removed, but when examined it did not appear to be diseased. Twice the common bile duct was drained during attacks of pain. Ultimately he became a pethidine addict. In one attack of pain relief was obtained by bilateral splanchnic block; a right-sided sympathectomy, removing ganglia from D8 to L2, seemed to give more prolonged relief until his death two months later from spontaneous intraperitoneal haemorrhage. Investigations showed impaired fat absorption, a mild diabetic type of sugar-tolerance curve, achlorhydria, and atrophic gastritis. At necropsy the pancreas was shrunken, and histologically showed replacement of much of the pancreatic acinar tissue by fat (Fig. 6). Severe atheroma of the aorta was present.

The disease tends to be progressive, and in less fortunate patients the replacement of acini by fibrotic tissue and deposits of calcium may have profound metabolic effects.

A 49-year-old man had frequent attacks of pancreatic pain and ultimately developed diabetes mellitus. Pain made life



Fig. 6.—Section of pancreas from a case of chronic relapsing pancreatitis. The gland was considerably shrunken. Much of the acinar tissue has been replaced by fat. (Haematoxylin and eosin. $\times 150$.)

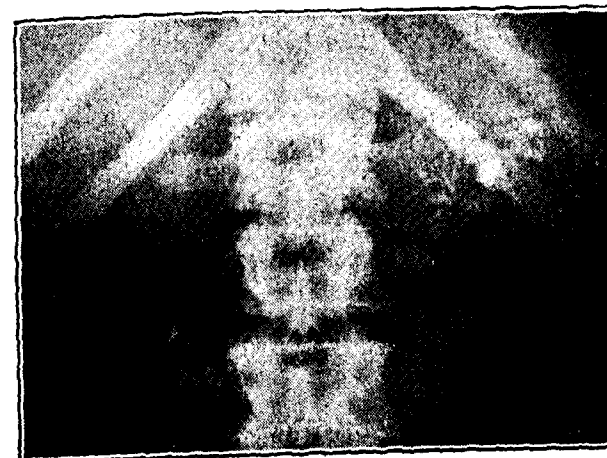


Fig. 7.—X-ray film of the pancreatic area in a middle-aged man with relapsing pancreatitis and diabetes mellitus, showing diffuse calcification throughout the gland.

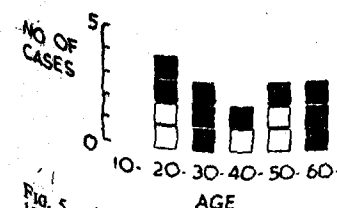


Fig. 5.—Age and sex distribution of 15 cases of chronic pancreatitis. White squares, males; black squares, females.

intolerable, and he lost 3 st. (19 kg.) in weight. Investigations showed impaired fat absorption and poor gelatin digestion. An x-ray film of the pancreatic area (Fig. 7) showed diffuse calcification.

The diagnosis of chronic relapsing pancreatitis is based on the history of recurring episodes of upper abdominal pain without other obvious cause, and evidence of deficiency of either internal or external pancreatic secretion, such as glycosuria and hyperglycaemic sugar tolerance (see Fig. 8), frank steatorrhoea, wasting, or a low flat type of gelatin absorption (see Fig. 9). The finding of a raised urinary diastase is of the utmost importance in diagnosis in obscure cases. In advanced cases a search should be made radiologically for pancreatic calcification.

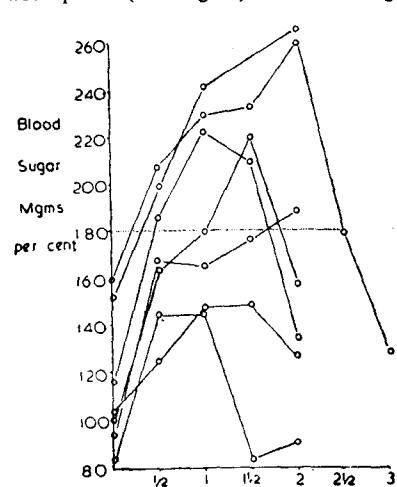


FIG. 8.—Oral sugar tolerance curves in seven cases of chronic pancreatitis.

In three cases liver biopsy was performed. In one case mild fatty change, presumably of nutritional origin, was found. Gross degrees of fatty change and actual cirrhosis have been noted by other observers (for example, Fiesinger and Olivier, 1933; Snell and Comfort, 1937; Sharp *et al.*, 1952). Whether these cirrhotic changes in the liver develop *pari passu* with pancreatic fibrosis as a result of suboptimal nutrition, or whether they are the result of impaired digestion of fat and protein due to pancreatic insufficiency, is open to debate. In one case gastric biopsy showed severe atrophic gastritis.

The treatment of chronic relapsing pancreatitis is a problem beset with extraordinary difficulties. In the early stages recurrent attacks of pain may be prevented by improving the diet and enforcing strict abstinence from alcohol; but with regard to the more advanced cases there is at present no uniformity of opinion regarding the correct course of action which should be taken. Many American surgeons advise interruption of the afferent nervous pathways, either by limited splanchnic nerve section (de Takats, Walter, and Lasner, 1950) or unilateral sympathectomy

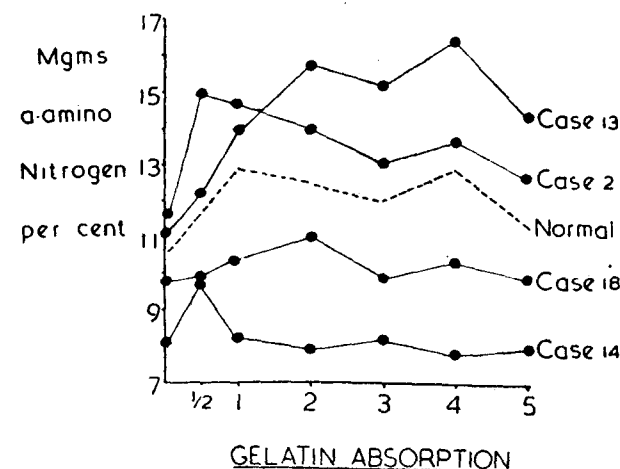


FIG. 9.—Gelatin absorption curve in four cases of chronic pancreatitis. The level of amino-nitrogen is followed at intervals for five hours after the administration of gelatin (50 g.).

(Hurwitz and Gurwitz, 1950), or by the more radical bilateral lumbo-dorsal sympathectomy combined with splanchnicectomy (Connolly and Richards, 1950). However, Cattell and Warren (1952) maintain that these measures offer only temporary relief from pain and advise pancreatoduodenectomy.

Our own experience is too limited to be of value. In three patients the pain was temporarily abolished by bilateral splanchnic block. In only one patient was a limited sympathectomy performed, and his early death two months after operation prevented adequate assessment of the result.

Relapsing Pancreatitis Following Cholecystectomy

All eight female patients in this group had what might be called the "gall-stone diathesis"—most were obese, most had hypertension, and three were known to have had diabetes mellitus for some time. In all patients calculi were present when the gall-bladder had been removed. Often within a few months of cholecystectomy these patients experienced attacks of upper abdominal pain. Often this was felt below the right costal margin, and led them to believe that their pre-operative biliary colic had returned. Abnormally high levels of urinary diastase were noted during these attacks.

An obese 45-year-old woman with mild diabetes mellitus had her gall-bladder removed for cholelithiasis. Six months later she had a severe attack of abdominal pain lasting two days. The urinary diastase was 1,000 units. Two further attacks occurred and on each occasion the diastase was raised.

In some cases it was noted that pain followed an unusually large fatty meal. Alcoholism and frank dietary deficiency did not seem to be causative factors; in fact, improvement in many cases occurred when measures were taken to reduce weight by advising smaller non-fatty meals.

It seems likely that many patients suffering from the so-called "post-cholecystectomy syndrome" have, in fact, a mild recrudescence of pancreatitis. Doubilet and Mulholland (1949) maintain that spasm of the sphincter of Oddi may cause a rise in pressure in the common bile duct sufficient to lead to regurgitation of bile into the pancreatic duct in patients with a common channel. It is known that bile injected experimentally into the pancreatic duct causes chemical inflammation. They advise section of the sphincter; but we regard the factual basis of their hypothesis as unproved, and none of our patients have been subjected to this operation.

Other Causes of Chronic Pancreatitis

A 23-year-old woman with a long history of ulcerative colitis and a grossly deficient diet had an attack of severe abdominal pain. At laparotomy acute pancreatitis was found, but the organ was also fibrous, indicating chronic pathological change.

Ball *et al.* (1950) described interstitial chronic inflammatory changes in a high proportion of cases of ulcerative colitis examined at necropsy. Since nutritional hepatitis is also common in ulcerative colitis it is reasonable to assume that malnutrition plays an important part in the causation of pancreatitis in this condition.

A 34-year-old woman had infectious hepatitis in 1949. This was followed by frequent attacks of abdominal pain. All investigations were negative except for the finding of high diastase levels up to 152 units during the attacks.

The clinical evidence was in favour of a direct causative relationship between this patient's pancreatitis and the original infection with the virus of infectious hepatitis.

A 26-year-old man had attacks of upper abdominal pain and intermittent jaundice of obstructive type. He also had symptoms of diabetes mellitus. At laparotomy the pancreas was fibrotic and indurated, but the gall-bladder and common duct were normal. The gall-bladder and common duct were drained and the jaundice subsided.

No obvious cause of chronic pancreatitis was found in this case. Obstructive jaundice is not an uncommon manifestation of chronic pancreatitis (Selesnick, 1952), and this case illustrates an important point in the surgical management.

When the gall-bladder is not diseased, under no circumstances should it be removed, for later it may be used with advantage in a short-circuiting operation for the relief of jaundice.

Intravenous Secretin Test

The results of this test in eight normal subjects, five patients recovering from acute pancreatitis, and eleven patients with chronic pancreatitis are shown in Fig. 10. In each group a very wide range of values of both volume and bicarbonate content of the duodenal contents was found.

Although there is an obvious statistical tendency towards lower volumes and bicarbonate content in patients recovering from acute pancreatitis and in patients with chronic pancreatitis, the degree of overlap in values as compared with normal healthy subjects is enough to render the test unsuitable for ordinary diagnostic purposes. Dornberger and his colleagues arrived at a similar conclusion.

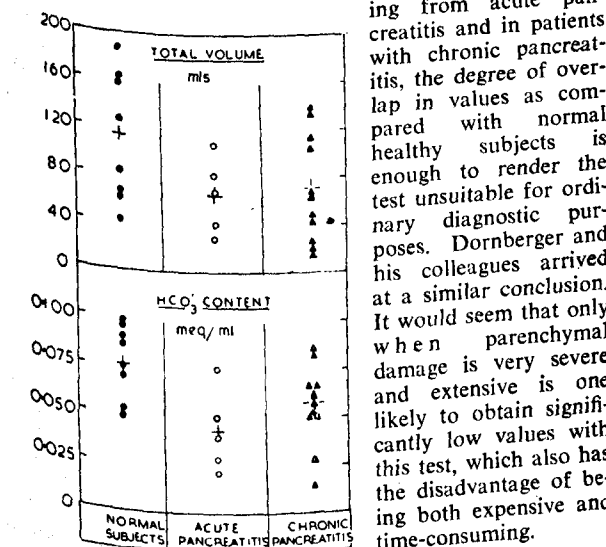


FIG. 10.—Scatter diagram showing volume and bicarbonate content of duodenal aspirate after the administration of secretin intravenously in eight normal subjects, five patients recovering from acute pancreatitis, and eleven patients with chronic pancreatitis. + = mean value.

Discussion

With respect to pancreatitis it is clear that there are many unsolved problems. Even clinical recognition is not always an easy matter: acute pancreatitis is not always correctly diagnosed, and chronic pancreatitis may manifest itself under a number of guises which may tax the diagnostic skill of the clinician. Once an increased awareness of this condition becomes prevalent among physicians and surgeons, however, and once the habit of calling for urinary diastase estimations in cases of obscure abdominal pain is acquired, it is likely that more cases will come to light, with opportunities for further study.

One of the difficulties encountered in the diagnosis of milder cases of acute and relapsing pancreatitis is the lack of reliable laboratory tests. The finding of high levels of pancreatic enzymes, either in the serum or in the urine, should suggest pancreatitis, but there is evidence that such elevation is often transient. In our hands the secretin test has been of little practical value. Innerfield *et al.* (1952a, 1952b) have demonstrated a high level of plasma anti-thrombin activity in both acute and relapsing pancreatitis, and it is possible that this may prove to be a subtle laboratory test of considerable value. In suspected chronic pancreatitis, steatorrhoea (faecal fat content more than 30%), a hyperglycaemic sugar-tolerance curve, and calcification of the pancreas should be looked for.

If these investigations prove negative despite a strong clinical suspicion of pancreatitis, diagnostic laparotomy is justifiable. The pancreas should be carefully inspected and palpated. However, it is believed that closer correlation between naked-eye appearances and actual histology is demanded, and to this end a technique of obtaining biopsy

material is being developed, using a Franseen aspiration liver biopsy needle (the material shown in Fig. 3 was obtained by this means).

In the attempt to elucidate the aetiology of pancreatitis it was apparent that a heterogeneous group of conditions was being grouped under one heading only by virtue of the fact that one organ, the pancreas, was predominantly affected. Now the only things shared in common by infectious hepatitis, Laennec's cirrhosis, infectious cholangitis, and xanthomatous biliary cirrhosis are pathological changes in the liver resulting in jaundice, yet we do not refer to these diseases collectively as "hepatitis." The same reasoning may with justification apply to the pancreas. Chronic pancreatitis complicating ulcerative colitis is a totally different entity from pancreatitis following cholecystectomy; likewise, pancreatitis complicating biliary calculi has an entirely different pathogenesis from that occurring in alcoholic subjects.

What are the factors known and believed to be the cause of pancreatitis? Trauma to the pancreatic ducts, during gastrectomy for example (Millbourn, 1949), causes pancreatic inflammation. Any condition which causes reflux of bile into the pancreatic ducts may also produce pancreatitis. This is presumably the mechanism in those cases of pancreatitis following cholecystectomy in which pressure gradients in the common bile duct are believed to be disturbed. When calculi obstruct the ampulla, in addition to reflux along the "common path," infection is probably an added factor.

There is accumulating clinical and experimental evidence that, as with the liver, certain foodstuffs have a protective action on the pancreas. Fatty changes and fibrosis in the pancreas have been shown to be present (Waterlow, 1948; Davies, 1948) in undernourished native races at necropsy. Necrotic pancreatic lesions have been demonstrated in rats fed on a low-protein diet (Lindsay *et al.*, 1948). It is probable that methionine is an essential protective metabolite, for when the ethyl analogue of methionine, ethionine, which blocks the utilization of methionine, is fed to experimental animals pancreatic necrosis invariably occurs (de Almeida and Grossman, 1952). The clinical counterpart of these experimental findings is the type of pancreatitis which occurs in malnourished alcoholic patients and as a complication in patients suffering from ulcerative colitis. In alcoholic patients there is also the possible additional aetiological factor of the stimulation of excessive quantities of pancreatic juice during a drinking bout. In our studies with the double lumen tube it was noted in control subjects that the rate of flow of duodenal aspirate was trebled when 2 oz. (57 ml.) of brandy was introduced into the stomach.

The presence of arterial hypertension in a high proportion of patients with pancreatitis has been commented upon by Heinz (1952). Care must be taken in interpreting these statistics, for many patients of middle age with cholelithiasis, who comprised a large number of his cases, tend to have the obese hypertensive diathesis. There are a few hints, however, that this correlation may not be entirely coincidental, for there are on record in the literature a number of cases of pancreatitis complicating familial hypercholesterolaemia (Holt *et al.*, 1939; Collett and Kennedy, 1948; Klatskin and Gordon, 1952). There is evidence also that genetic factors may be involved in the causation of chronic relapsing pancreatitis. Comfort and Steinberg (1952) reported on a family in which the condition occurred in four generations; our own observation of acute pancreatic necrosis occurring in identical twins is also of interest. The relationship between hypercholesterolaemia and the development of atherosclerosis is well known, and it is an intriguing possibility that vascular disease may be at least a condition which predisposes to the development of pancreatitis.

Finally, the possibility of a virus infection, either of mumps or of infectious hepatitis, must not be disregarded in obscure cases.

Thus a variety of aetiological factors, acting either alone or in combination, may lead to pathological change in the

pancreas sufficient to cause clinical manifestations. The following entities can be quite sharply differentiated: (1) *Traumatic pancreatitis*, following surgery of the stomach and duodenum; (2) *virus pancreatitis*, complicating mumps and possibly infectious hepatitis; (3) *reflux pancreatitis*, complicating biliary calculi and following cholecystectomy; (4) *chronic nutritional pancreatitis*, or "chronic relapsing pancreatitis," occurring in malnourished alcoholic patients; (5) *metabolic pancreatitis*, complicating hyperlipaemia and hypercholesterolaemia.

The difficult problem of treatment must be approached with this aetiological perspective in view. Surgery plays no part in the immediate management of acute pancreatitis, when electrolyte replacement and the prevention of secondary infection are considerations of life-saving importance. When acute symptoms have subsided an attempt must be made to assess the predominant aetiological factor involved; if radiological studies reveal the presence of biliary calculi cholecystectomy should be performed, but if there is no evidence of gall-bladder disease cholecystectomy is absolutely contraindicated, for it may be necessary to use the gall-bladder later in a short-circuiting operation if further attacks of pancreatitis lead to obstructive jaundice. If the patient is an alcoholic, abstinence must be enforced and a high-protein diet advised. All that can be said at the present time about reflux pancreatitis following cholecystectomy is that control of weight and limitation of fat intake have yielded good results: one waits for further reports from those surgeons who courageously perform ampullary sphincterotomy.

The position with regard to surgery in chronic relapsing (nutritional or metabolic) pancreatitis is still by no means settled. If it is proved that splanchicectomy and lumbo-dorsal sympathectomy offer only temporary relief from pain it will be necessary to resort to pancreaticoduodenectomy. This might seem an unwarranted surgical risk, but such is the severity of the pain and the misery of the patient that heroic measures are called for in some cases. Moreover, in competent surgical hands these risks have been greatly reduced, as has been shown by Smith and Brown (1952), in their experience of surgery of carcinoma of the pancreas.

Summary

The clinical features and laboratory investigations in 24 proved cases of acute and chronic pancreatitis have been studied at the Royal Melbourne Hospital, Melbourne, Australia.

It is felt that the confusion of thought which exists on this subject might in part be dispelled if attention was paid to aetiological aspects of the problem. Reasons are presented for considering traumatic pancreatitis, virus pancreatitis (mumps and infectious hepatitis), "reflux" pancreatitis, chronic nutritional pancreatitis, and metabolic pancreatitis as distinct clinical entities.

In acute pancreatic necrosis good results were obtained with conservative treatment—continuous aspiration of the gastric contents, electrolyte replacement, and the administration of antibiotics.

Chronic relapsing (nutritional) pancreatitis is a condition characterized by recurrent attacks of pancreatic oedema and necrosis causing pain; ultimately destruction of the gland and replacement fibrosis lead to wasting, steatorrhoea, and diabetes. Pancreatic calcification is occasionally visible radiologically and induration of the head of the pancreas may cause obstructive jaundice.

In the absence of biliary calculi, cholecystectomy is contraindicated in chronic pancreatitis. When severe and unremitting pain becomes a feature in advanced cases a choice must be made between sympathectomy and pancreaticoduodenectomy.

Relapsing "reflux" pancreatitis was found to occur in female patients following cholecystectomy. Further data on the mechanics of the sphincter of Oddi and the common bile duct are required before agreement on the surgical relief of these patients can be reached.

The diagnosis of mild cases of acute and chronic pancreatitis may be difficult. Although elevation of the urinary diastase level is helpful this may be only transient. Collateral evidence of steatorrhoea, glycosuria, pancreatic calcification, and impaired protein digestion should be sought for in diagnosing chronic pancreatitis of all types.

We wish to thank those members of the honorary medical staff of the Royal Melbourne Hospital who kindly referred patients for investigation. We also wish to acknowledge the help we have received from our colleagues in the Clinical Research Unit.

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In an appeal for funds, signed by Dr. Elliott P. Joslin, the president, the Diabetes Foundation announces that it was incorporated in 1953 with wide powers to include not only activities concerning the support of research and camps for diabetic children, formerly dealt with by separate funds, but also the administration of a new hospital teaching clinic which it is hoped to build as soon as the necessary money is available.

L-NORADRENALINE IN TREATMENT OF SHOCK IN CARDIAC INFARCTION

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Cardiac infarction is more often than not accompanied by shock. Usually it is transient and passes off as the pain abates under the influence of morphine. In some patients it persists and appears to contribute to an early fatal issue, while, in a few, shock gravely complicates the clinical state during a period of several days or even a week in an illness which in four cases out of five ends in death. It is in this last group that physicians have felt the lack of therapy to combat peripheral circulatory collapse, in which pressure may fall to levels that can hardly, if at all, be recorded, with disappearance of pulse and loss or clouding of consciousness. Intravenous infusions of hypertonic glucose, plasma, blood, and dextran have been used, and slight success has been claimed. In spite of its obvious possibilities, adrenaline has been discarded in this condition; it may raise the pressure but the risk of ventricular fibrillation is too great. On the other hand, other pressor drugs of the sympathomimetic amine series have been shown to raise the blood pressure without increasing the rate or the work of the heart. It was the claim of anaesthetists that the laevo-rotatory form of noradrenaline secured their patients against serious falls of pressure during major operations which led us to the use of this substance in cardiogenic shock. In this paper we report the results of the use of L-noradrenaline bitartrate ("levophed") in the six instances in which we have employed it for this purpose.

Material and Methods

We have, so far, treated only six patients suffering from shock in myocardial infarction with infusions of L-noradrenaline bitartrate, restricting this treatment to those patients whose lives we judged to be immediately threatened by shock. As L-noradrenaline is a sufficiently powerful overall vasoconstrictor to be effective in doses ranging from 5 to 40 µg. a minute when used in the treatment of any peripheral vasomotor collapse (Swan, 1952), we ensured a sufficient dilution by adding 4 ml. of 1/1,000 L-noradrenaline bitartrate solution to a litre of isotonic solution, either of 5% dextrose or of 4.3% dextrose in 0.18% saline, thus giving a drug strength of 4 µg. per ml. Normal saline as a vehicle was avoided in view of the danger of introducing excess of sodium ions into the circulation when heart failure existed or might supervene. Intravenous drip infusions were set up with one or other of these solutions, and preparations were made to continue the infusions for periods of a few hours to a few days. The concentration of drug necessary to keep the blood pressure at a chosen level varied greatly with each patient, but it was sometimes found that drip rates of more than 36 drops a minute were required. As this would entail giving a total infusion of more than three litres in 24 hours, the concentration of the L-noradrenaline bitartrate was increased as much as necessary—on one occasion to 64 ml. per litre—so as to be able to reduce the drip rate by the same factor. By this means the risk of circulatory overloading was abolished,

although the control of the blood pressure by adjustment of drip rate became less sensitive.

In accordance with the main indication already mentioned, the use of L-noradrenaline infusion was considered whenever the systolic blood pressure was progressively falling in cardiogenic shock or when it was found to be 80 mm. or less for more than 24 hours, especially in the presence of a very small pulse pressure and oliguria. That we have been reluctant rather than anxious to employ this treatment is shown by the fact that two of our six patients were pulseless when the infusion was begun.

The presence of a nurse capable of measuring the blood pressure reliably was found to be essential. Throughout the whole period of the treatment vigilant attention had to be given to the drip rate, which might spontaneously vary with corresponding and perhaps dangerous fluctuations in blood pressure, which was generally kept between 100 and 110 mm. systolic. It was found that there was a direct and immediate relationship between drip rate and the blood pressure; with a turn of the regulating screw the pressure could be raised or lowered at will. On one or two occasions when the infusion was brought to an end the blood pressure fell abruptly; it therefore became our rule to discontinue the infusion by degrees while a close watch was kept on the blood pressure.

Case 1

A man aged 49 was admitted to hospital at 2 p.m. on June 16, 1952, on account of sudden very severe pain in the centre of the chest and vomiting. For three years he had had angina of effort; there had been cardiographic evidence of old antero-septal cardiac infarction, and the blood pressure was usually 140/90. He was extremely ill and shocked, and was drenched in sweat. The temperature was 97° F. (36.1° C.), and the heart sounds were distant. The systolic blood pressure was 60. Injections of morphine totalling 4 gr. (50 mg.) were needed for relief of pain, and an intramuscular injection of 12,500 units of heparin was given. Although the condition improved during the day, the pressure during the following morning varied between 70 and 65 mm. systolic. In spite of intravenous injections of nikethamide, the pulse at the wrist disappeared, the extremities being cold and clammy.

An intravenous infusion of 20 oz. (570 ml.) of plasma failed to bring improvement. To a second similar quantity 4 ml. of 1/1,000 L-noradrenaline was added. Immediately this had started, the pressure rose to 100 and was maintained at 90 by an infusion rate of 60 drops a minute. Thereafter, the infusion was continued with 4.3% dextrose in 0.18% saline containing 16 ml. of 1/1,000 L-noradrenaline per litre; a drip rate of 36 drops a minute sufficed to keep the systolic pressure in the neighbourhood of 90 (Fig. 1). The condition of the patient remained critical, in spite of oxygen administration and maintenance of the drip throughout the day; on one occasion when it accidentally stopped the patient at once became pulseless. A pint (570 ml.) of plasma brought no improvement, but renewal of the L-noradrenaline infusion at once restored the pulse, while the pressure rose to 95 and later 115. The drip had to be maintained continuously for 48 hours, but when it was then discontinued the pressure fell slowly from 120 to 85, at which level it remained. An electrocardiogram showed antero-posterior infarction of the heart.

The patient made a gradual recovery in spite of temporary congestive heart failure, and he was discharged from hospital on July 27. Two months later he was readmitted in severe left ventricular failure, which in spite of every effort worsened and ended fatally on October 19, about four months after the onset.

Necropsy showed fibrotic scars of cardiac infarctions involving the posterior and lateral walls of the left ventricle and the anterior wall in the neighbourhood of the septum. The right coronary artery and the circumflex branch of the left coronary were occluded 2 cm. from the origin in each case.

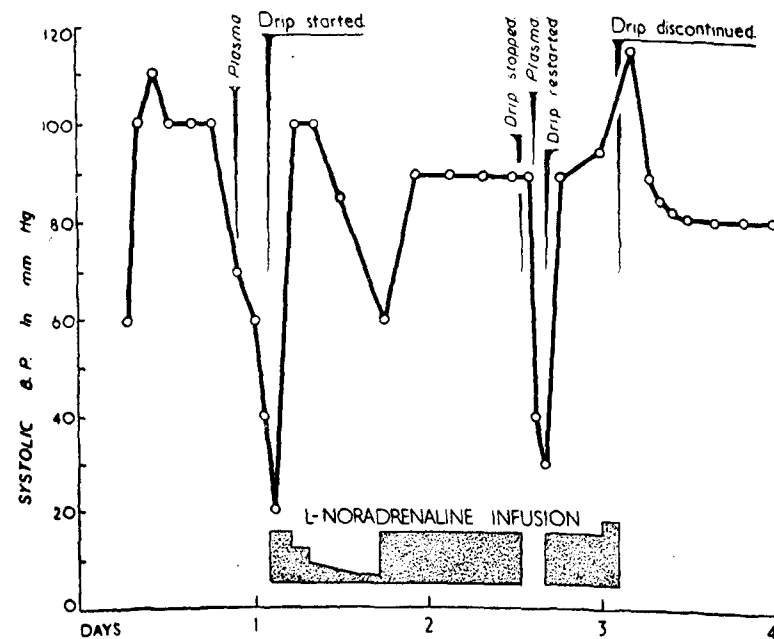


FIG. 1.—Graph showing rise of systolic pressure during intravenous infusion of dextrose-saline containing L-noradrenaline, 4 ml. 1/1,000 solution to the litre, in a patient with severe cardiac infarction and shock (Case 1).

Case 2

A woman aged 67 was admitted for an operation on her left hip. Clinical examination showed no cardiovascular abnormality save a blood pressure of 170/90. The operation was performed at noon on September 22, 1952. There had been little trauma or blood loss, but near the end of the operation she suddenly collapsed and became pulseless. Surgical shock was diagnosed, and an intravenous plasma infusion containing 4 ml. of 1/1,000 L-noradrenaline to the pint (570 ml.) was given, whereat the blood pressure became measurable at 80. On surgical grounds the infusion was changed to whole blood, and later to normal saline, but always with the same addition of L-noradrenaline, and at the rate of 40 to 60 drops a minute. Eleven hours after the start of the operation the patient regained consciousness. She had pain at the site of the operation, but nowhere else.

On the next day the condition had further improved. There was still no cardiac pain and the heart sounds were faint. Continuance of the L-noradrenaline-saline drip, now changed to 0.18% saline, enabled the blood pressure to be kept at about 100 mm. systolic, and the level could be raised or lowered at once by quickening or slowing the drip.

On September 24 an electrocardiogram revealed that the unsuspected cause of the collapse had been a large through-and-through antero-lateral infarction of the heart. The patient remained dependent on the L-noradrenaline infusion; although she was not breathless and the urinary output remained good, the sacrum and legs became oedematous. Fluid-balance charts revealed that 6 pints (3.4 litres) more fluid had been taken in than had been excreted in the previous 36 hours. This was remedied by quadrupling the concentration of L-noradrenaline and reducing the rate of the drip to 15 to 20 a minute. Heparin and bismouacetate were then started. The L-noradrenaline administration had to be continued for five days, when a very gradual cessation was begun; any sudden reduction in drip rate was followed by an abrupt and dangerous fall of systolic pressure, so that the pro-

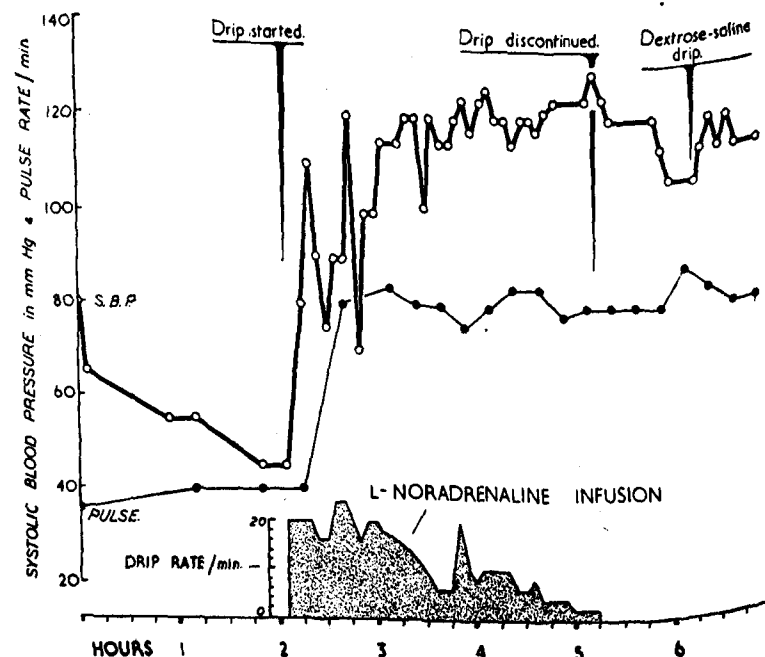


FIG. 2.—Graph showing rise of systolic pressure during intravenous infusion of dextrose-saline containing L-noradrenaline in varying concentration. Case 3, suffering from acute posterior cardiac infarction with initial complete A-V block and auricular fibrillation.

cess of cessation took 72 hours to complete. The systolic blood pressure then remained at 85 mm., with a pulse of 100 a minute. During the next two months in hospital, the pressure fluctuated between 90/50 and 105/70, which was the reading on discharge. Seven months later there was no dyspnoea or angina, and the blood pressure was 105/70.

Case 3

A man of 53 was admitted at 6.30 p.m. on May 8, 1953, with a history of a sudden onset of severe retrosternal pain. He had vomited twice and sweated profusely. The extremities were cold, the temperature being 96.2° F. (35.7° C.), and the pulse regular at 36 a minute. The blood pressure was 80 systolic. The heart sounds were faint and the cervical veins engorged.

Electrocardiography confirmed the clinical presumption of complete A-V block and showed auricular fibrillation as well as patterns of an extensive posterior cardiac infarction. The blood pressure fell steadily in spite of general measures to combat shock, and one hour after admission it was 55 systolic, the patient looking as if about to die. The pulse rate was 40 a minute.

As soon as an infusion of dextrose-saline containing 4 ml. of 1/1,000 L-noradrenaline per litre was started he looked better and uttered some words. At an infusion rate of 20 drops a minute the blood pressure rose swiftly to 80–115 systolic. Within 15 minutes of the infusion being started there was a sudden reversal to normal rhythm at 80 a minute (Fig. 2).

After one and a half hours of this treatment the drip rate was gradually slowed without fall of the blood pressure, and during the next two hours the L-noradrenaline concentration in the infusion was halved. It was discontinued after a total duration of just over three hours. During the next two months there was uninterrupted convalescence with improving effort tolerance. At a later examination the heart was found to be not enlarged and the pressure remained around 130/80.

Case 4

A woman aged 73, a patient of Dr. D. I. L. Gleed, of Finchley, was seen in consultation on March 15, 1953. She had for nine years suffered from angina of effort, and had latterly been taking 50 trinitrin tablets weekly. At noon she was seized with an attack which caused collapse with loss of consciousness. She was grey and sweating with a weak pulse at 60 a minute. She vomited twice.

Examination six hours after the onset showed the patient still shocked, with a pulse of 72 and blood pressure 105/75. An electrocardiogram showed extensive postero-lateral infarction of the heart. Admission to hospital took place the same evening, when the pulse had quickened to 100 and the pressure had fallen to 90 systolic. Signs of congestive heart failure were developing, and there was pericardial friction to the left of the sternum.

At 1.30 a.m. that night renewed collapse occurred with sweating and unconsciousness; the systolic pressure fell to 50 and the pulse was hardly perceptible. At 2.5 a.m. an intravenous infusion of dextrose-saline containing 2 ml. of 1/1,000 L-noradrenaline per litre was started. Instantly the condition improved, the systolic pressure rising to 80 and later to 100. Throughout the day of March 17 the condition remained fairly satisfactory in that, despite sweating and chilliness of the extremities, the pressure was maintained at the same level by adjustment of the drip rate. Electrocardiography that evening showed that right bundle-branch block had now developed. The white cells numbered 31,200 per c.mm. During the following night the condition again became very grave, the pulse becoming weaker, with increasing signs of collapse. The drip rate was increased, but in spite of this and of an intravenous injection of theophylline with ethylenediamine the heart rate increased to 100 while the pulse became imperceptible. Death took place 66 hours after the onset of the illness.

Necropsy showed a recent infarction in the interventricular septum extending to the adjacent parts of the anterior and posterior walls of the left ventricle. The anterior part of the septum had become thinner, with the beginning of dilatation in this part of the ventricle. The remainder of the myocardium showed diffuse patches of fibrosis. Patches of calcified atheroma were found in both coronary arteries and their main branches. While the vascular lumen was in places much reduced, no occluding thrombus could be found.

Case 5

A woman of 75 was seen in consultation with Dr. Alan Strachan, of Sutton, on April 18, 1952, when she was in a state of cardiogenic shock. This had set in at 10 a.m. that day, about half an hour after an injection of morphine and atropine preparatory to dental extractions. It later transpired that three years previously a similar injection for gallstone colic had been followed within a few minutes by collapse, with pallor and a thready pulse. On that occasion there had been swift recovery after an injection of nikethamide, but in the present attack pain had developed around the trunk at the level of the diaphragm. The foot of the bed was raised and oxygen was given. The condition improved, but the pain persisted, later centring over the right upper quadrant of the abdomen.

At the consultation that evening there was pain across the lower part of the back with a bruised feeling in the upper part of the abdomen. The patient was shocked though not in distress; the pulse was regular at 64 a minute, and the blood pressure was 85 systolic. The clinical state did not permit thorough examination, but the heart sounds were heard softly at all areas, and there was no pericardial

friction or gallop. There was no tenderness in the abdomen; arterial pulsation was felt readily in the feet. An electrocardiogram showed low voltage in standard leads, intraventricular conduction defect, and lateral subendo-cardial ischaemia. It was concluded that acute coronary insufficiency had followed a sudden severe fall of blood pressure as a result of abnormal sensitivity to an injection of morphine and atropine.

During the following day or two the condition fluctuated; the symptoms lessened but the blood pressure remained at 80 systolic. On April 22, four days after the onset, an intravenous drip infusion of dextrose-saline containing 4 ml. per litre of 1/1,000 L-noradrenaline was set up at 6 p.m. The blood pressure began to rise within a minute or two, and reached 90 after ten minutes. It then increased steadily to 120 at the end of 30 minutes. Slowing the drip was followed at once by a drop to 110, and this level was maintained without difficulty for four hours (Fig. 3). At the end of this time the systolic pressure was 105, and one litre of the infusion had been given. It was then discontinued.

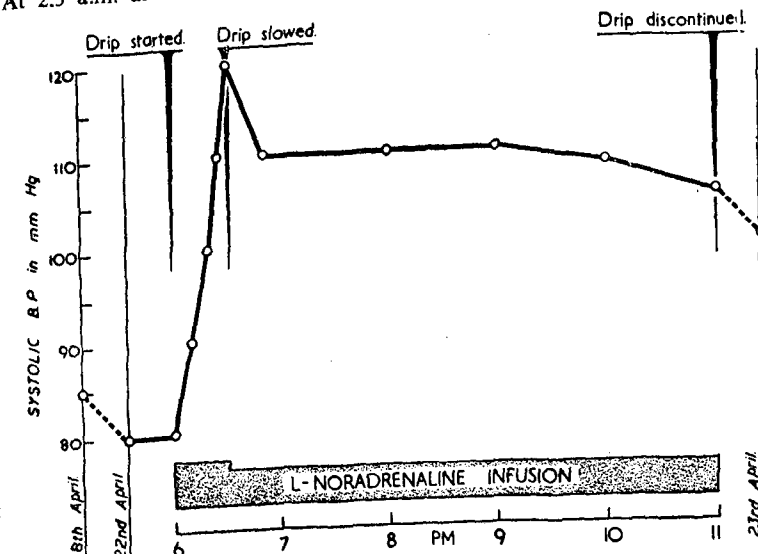


FIG. 3.—Graph showing rise of systolic pressure resulting from intravenous infusion of dextrose-saline containing L-noradrenaline started on the fourth day of cardiogenic shock due to acute coronary insufficiency (Case 5).

On the following morning the general condition had much improved and the pressure was 100. Three months after the onset the patient was up and about quietly, with a blood pressure of 110/75. The cardiogram showed regression of the patterns representing myocardial ischaemia. Radioscopy showed mild left ventricular hypertrophy, normal hilar shadows, and clear lung fields.

Case 6

A man of 61 who had been treated for cardiac infarctions in 1948 and December, 1952, was under periodic observation until, in the summer of 1953, he began to complain of dyspeptic symptoms, and a barium meal examination led to a diagnosis of carcinoma of the pylorus. Partial gastrectomy was performed by Mr. Norman Lake on August 20, with complete removal of a pyloric carcinoma. During the operation the patient never received less than 30% oxygen. Soon after the operation was started he became shocked and the pulse was faint and irregular. He was transfused with 2 pints (1,140 ml.) of blood, and after return to the ward the blood pressure was 130/90. During the next 36 hours the blood pressure fell gradually to 80/65, and he appeared to be moribund. It was judged that this illness was due to infarction of the heart, but cardiography could not be carried out at once. It was decided to give L-noradrenaline.

The infusion of dextrose-saline containing 8 ml. of 1/1,000 L-noradrenaline per litre was begun at a rate of 26 drops a minute. The blood pressure quickly rose to 110/85. In order to maintain this pressure it was necessary to raise

the drip rate to 40 drops a minute, and after 18 hours to double the concentration of L-noradrenaline and reduce the infusion rate from 40 to 30 drops a minute. At this stage a cardiogram showed antero-septal and postero-lateral infarctions. After a further six hours it was necessary to double the concentration again, and yet again seven hours later. The L-noradrenaline concentration was then 64 ml. per litre and the infusion rate 36 drops a minute. Over the next 12 hours the blood pressure was maintained at 110/85 with no further increase in concentration of the drug, and with a decrease in the rate of infusion to 24 drops a minute. The patient then suddenly developed a pulmonary embolism and died at 1.30 a.m. on August 25, one and a half hours after the onset of this complication.

The necropsy confirmed that there was a massive pulmonary embolism involving the whole right lower lobe. The anastomosis of the stomach remnant to the jejunum was intact and no evidence of secondary neoplastic deposits was found. There was severe widespread atheroma of the coronary arteries. A large antero-septal infarction and a small postero-lateral infarction of the heart were present. There were also three old infarctions involving the posterior and lateral walls of the heart. In the left ventricle a great part of the muscle had been replaced by fibrotic tissue.

Discussion

The shock in myocardial infarction needs no special treatment if it is slight. It is upon the treatment of severe and continuing cardiogenic shock that controversy has centred. While some clinicians have employed oxygen, infusions of hypertonic glucose solutions, and stimulants such as nikethamide, these methods have not given constant or convincing results. There has naturally been a temptation to use pressor substances such as adrenaline and ephedrine, and, although they have been advocated in the past by Fishberg (1937), they have been generally condemned on account of the risk of inducing ventricular fibrillation (Eggleston, 1947; Wood, 1952).

The introduction of noradrenaline, and particularly of L-noradrenaline, the optical isomer which acts mainly upon blood vessels, has revived interest in the use of pressor substances in shock. This compound is the most powerful overall vasoconstrictor known and it lacks many of the pharmacological actions that have rendered adrenaline and ephedrine dangerous in cardiac infarction. Thus, in contrast to adrenaline, it does not increase the rate of the heart or the cardiac output; this is the result of reflex vagal cardio-inhibition, for L-noradrenaline stimulates mildly, but definitely, the isolated mammalian heart and the heart of the human under the influence of atropine. Also, whereas adrenaline raises the systolic pressure by its profound cardiac effects and hardly influences or actually lowers the diastolic pressure because of muscle vasodilatation, L-noradrenaline increases both systolic and diastolic pressure as a result of the marked generalized vasoconstriction (Goldenberg *et al.*, 1948). Moreover, Reale *et al.* (1950) have shown that, in the healthy subject, intravenous L-noradrenaline does not increase the oxygen consumption, as does adrenaline. Additional support for the use of this substance in shock due to heart disease comes from Burn and Hutcheon (1949), who have shown that L-noradrenaline is a coronary vasodilator in dogs and cats, but species differences exist and no work has been found on the action of the drug on the adult human coronary artery.

In experimental myocardial ischaemia in dogs produced by tying a coronary artery, Corday *et al.* (1949) demonstrated the harmful effects of hypotension on the infarcted zone and showed that such effects could be reversed by correcting the hypotension. In addition, Sayen *et al.* (1952) have shown that an L-noradrenaline infusion causes a rise in oxygen tension in the ischaemic zone, an effect greater than that produced by pure oxygen inhalation, while no ectopic beats or other arrhythmias were observed during the course of the infusion. On the other hand, Wiggers (1952) has pointed out that such experiments have been performed

on dogs in which intercoronary anastomoses are better developed than in man, and he groups noradrenaline with adrenaline and ephedrine as potentially dangerous in myocardial infarction owing to the increase in the work of the heart and the risk of ventricular arrhythmias.

After weighing all such clinical and experimental evidence, it remains clear that even serious risks might be accepted when the blood pressure in cardiogenic shock is progressively dropping, when the pulse is disappearing, and death wellnigh at hand.

Some work on the use of L-noradrenaline in the shock attending myocardial infarction in man has already been published. Miller and Baker (1952) employed this treatment in seven such patients. A rise of blood pressure was produced in four and in no instance was there any arrhythmia. Six of the patients died. The criterion for use in these cases was a systolic blood pressure of 80 or less continuing for four hours, and they concluded that the results might have been better had infusion been started earlier. Maintenance of infusion until the improvement in the circulatory state was established, and gradual rather than abrupt cessation was advised. More favourable results have been reported by Kurland and Malach (1952), who treated with L-noradrenaline 14 patients suffering from shock due to cardiac infarction. In 12 cases there was a significant pressor response, but the ultimate results were disappointing, as five died from 1 to 41 days after recovery from the state of shock and only four ultimately survived. No arrhythmias that could be attributed to the infusion were observed, although these workers recorded intense venous spasm, phlebitis, and ulceration of the skin at the site of the infusion as occasional complications.

Although our series of six cases is a small one the results are encouraging, since four of these patients survived for four months or more. Three of them were still alive at intervals of six to thirteen months after infarctions which caused grades of shock so severe and prolonged that death appeared to be imminent. In no case did L-noradrenaline cause harm. In spite of the increase in systemic and pulmonary resistances heart failure was never induced by the treatment.

In this grave state of cardiogenic shock there are two elements; the shock and the underlying myocardial injury. Study of our cases endorses what must have been the clinical impression of many—that the degree of shock is not necessarily proportional to the extent of the infarction. If shock is severe and the lesion is gross, then a fatal issue may be determined by the extreme disorganization of the heart. But when, as is sometimes the case, a lesser injury is attended by grave shock, then there is the possibility of recovery and subsequent reasonably good myocardial function, if the critical phase of shock can be surmounted, as exemplified in three of our cases. In the three patients who have died, necropsies have revealed multiple infarctions, old and new, representing a high degree of myocardial damage.

Summary

Six patients in severe shock due to cardiac infarction have been treated by intravenous infusions of dextrose-saline containing L-noradrenaline (levophed). In all of them a fatal issue appeared imminent or probable, the systolic blood pressure falling to levels between 45 and 80, and in two instances the wrist pulse disappearing.

In each case the start of the infusion was followed at once by clinical improvement, the systolic pressure rising to levels between 90 and 100, while the pulse again became palpable; where consciousness had been lost it was regained.

Two patients who had had previous infarctions responded in this way to the infusion, but died within three and four days, recent as well as old infarctions being proved at necropsy.

The remaining four patients made good recoveries after discontinuance of the infusions. Although one died of congestive heart failure four months after the cardiac infarction, the other three were alive and active at intervals ranging from six to thirteen months afterwards, their lives apparently having been saved by the treatment.

The criteria for infusion of L-noradrenaline are discussed and the methods and precautions necessary for its use described.

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ACUTE DISSEMINATED ENCEPHALOMYELITIS AND ACUTE DISSEMINATED SCLEROSIS RESULTS OF TREATMENT WITH A.C.T.H.

BY

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The treatment of seven cases of acute disseminated encephalomyelitis with A.C.T.H. was reported in a previous paper, in which the theoretical basis for trial of the drug was discussed (Miller, 1953). The results of treatment were held to be suggestive enough to warrant further trial. Three further cases have now been treated, and they are briefly reported below.

We have also used A.C.T.H. in the treatment of seven patients with acute exacerbations of disseminated sclerosis. Glaser and Merritt (1952) have already reported on the use of the drug in disseminated sclerosis. They treated 33 cases of the disease, giving 80 to 100 mg. daily during a course of 14 days' duration. These were chronic cases, and none had experienced significant remission during the three years preceding treatment, or since the onset of the disease in cases of less than three years' duration. Twelve patients showed significant improvement. The syndromes benefited were spastic-paretic, cerebellar-ataxic,

bladder dysfunction, and visual impairment of recent origin. Oculomotor disorders, sensory impairment, and reflex changes remained unaffected. The effects observed appeared during the course of drug administration and rarely persisted for more than seven to fourteen days after the end of treatment. In most cases the disease later resumed its usual course, though these authors believed that subsequent maintenance treatment with 75 to 150 mg. of cortisone daily might possibly retard its progression. They considered that the beneficial effects of the drug represented "secondary physiological phenomena due to the hyperadrenal state," whether produced by interference with abnormal immunological reactions in the central nervous system, suppression of inflammatory and connective-tissue responses, or the effect on nervous excitability of chemical changes related to the profound metabolic disturbance which A.C.T.H. is known to produce. A somewhat similar transitory improvement in cases of established disseminated sclerosis has been reported by Fog (1951).

We have, however, restricted the experimental use of A.C.T.H. to patients with a recent acute exacerbation of unequivocal established disseminated sclerosis. All cases had recently developed an acute neurological episode with some objectively assessable focal disability, either a fresh manifestation of the disease or the sudden aggravation or reappearance of a previous symptom. No patient was showing any sign of spontaneous improvement when treatment was begun, and progressive deterioration was evident in several. It seems reasonable to believe that the onset of an acute neurological episode of this nature signals the development of fresh plaques in the central nervous system. Although there is no general agreement on the pathogenesis of disseminated sclerosis, nor indeed on the histopathological changes present in recent lesions, it seemed justifiable to make a trial of A.C.T.H. in such cases.

We had found apparent improvement in acute disseminated encephalomyelitis, which shows several clinical and pathological similarities to disseminated sclerosis. Moreover, if an abnormal immunological reaction were responsible for such exacerbations (Pette, 1942) there are theoretical grounds for believing it might be aborted by A.C.T.H. There are similar grounds for believing that A.C.T.H. might also lead to the resolution of the acute inflammatory reaction which was considered by earlier authors—for example, Marburg (1906, 1942)—to be the basis of acute episodes of disseminated sclerosis. If, however, the initial change of the disease is demyelination, possibly as a result of enzymatic disorder (Lumsden, 1951), A.C.T.H. would be unlikely to have any effect once the process had begun, although such a view of the disease does not preclude the possibility that long-term administration of the drug might possibly prevent the development of fresh lesions.

It was felt that by selecting our cases on the above lines it would be possible to make an initial assessment of the effects of the drug on a relatively small number of cases, with a view to a more extended trial if the results were suggestive enough to justify this. It may be remarked that the collection of cases satisfying these criteria proved quite unexpectedly difficult.

In all cases of acute disseminated encephalomyelitis and disseminated sclerosis treated, 25 mg. of A.C.T.H. was given intramuscularly every six hours, usually for a period of five days. Repeated eosinophil counts were made, but in all the cases reported adequate adrenal response was obtained with this dosage.

Acute Disseminated Encephalomyelitis

The three additional cases of acute disseminated encephalomyelitis treated with A.C.T.H. comprise one case of special interest—an example of encephalomyelitis occurring during the course of acute rheumatic fever—and two patients suffering from encephalomyelitis following measles.

Case 1

Encephalomyelitic illness arising during the course of acute rheumatic fever in an 11-year-old boy of low average intelligence. Rapid recovery, beginning within 12 hours of administration of A.C.T.H.

Six weeks before his acute neurological illness this boy developed a febrile sore throat with muscle pains. This cleared up within a week but left him off colour, eating badly, and losing weight. Three weeks after the onset of the initial infection he developed a transient coalescent multi-form erythematous rash, and a week later an acute poly-arthritis with which he was admitted to hospital. At this time he was toxic, but only occasionally febrile, with a pulse rate of 122, a systolic apical murmur, triple rhythm, and partial auriculo-ventricular block with occasional dropped beats. During two weeks in hospital the joint pains were greatly relieved by salicylates, there was only an occasional spike of fever, and the E.S.R. fell from 125 to 41 mm. in the hour (Westergren). However, the child remained ill, and a continuing carditis revealed itself by persisting cardiographic signs, an increasingly loud murmur, and an episode of probable pleuropericardial friction.

Seventeen days after admission to hospital he was observed to be drowsy, and within thirty hours passed through stages of deepening stupor, lighter during the day and deeper nocturnally, to become almost unrousable.

Examination revealed slight neck stiffness, unequal sluggish pupils, spontaneous nystagmus, and a generalized increase of deep reflexes with extensor plantar responses. Within the next six hours he became profoundly hypotonic, with absent deep reflexes, and entirely unresponsive even to painful stimuli. The pressure and composition of the spinal fluid were entirely normal. An E.E.G. showed diffuse slow activity, chiefly in the delta range.

At this stage, 36 hours after the onset of neurological symptoms, he was given 50 mg. of A.C.T.H. followed by four injections of 25 mg. at six-hourly intervals. Improvement was evident within twelve hours. The patient was easily rousable, answered questions, and took food. Neck stiffness was less, the pupils were equal but sluggish, muscle tone was normal, and plantar responses remained extensor. Neurological improvement from this time was progressive. For three days the child was unduly drowsy at night, but at the end of this time symptoms and signs had entirely disappeared and the plantar responses were flexor.

Following this the child developed several syncopal attacks accompanied by extreme bradycardia, with a pulse rate as low as 38, which were improved by ephedrine. The E.E.G., however, showed progressive improvement, though the rheumatic process continued in a subacute form, and within seven days an apical diastolic murmur and involuntary movements typical of Sydenham's chorea made their appearance.

Case 2

Measles encephalitis in a boy of 10. A.C.T.H. given from the seventh day of the neurological illness. Improvement slow but progressive to complete recovery.

Four days after the appearance of a typical measles rash, when this previously healthy child appeared to have recovered, he suddenly became quiet and apathetic. He lay almost motionless thereafter, refusing food. On the third day he became mute and his legs stiff. On the fourth he developed retention of urine, and examination on admission to hospital showed him to be flushed and restless, with meningism, general hyperreflexia, extensor plantar responses,

and a normal spinal fluid. Twelve hours later he was barely rousable, and was febrile—99.6° F. (37.6° C.). The signs were unchanged, except that his stupor was deeper and the legs had become flaccid and the arms spastic.

A.C.T.H. was given at once. Twelve hours later he was more easily rousable but remained mute. Twenty-four hours after the first dose he was making semi-purpose movements with his arms and meningism had decreased. Twenty-four hours later the tendon reflexes became normal, and during the next few days tone in the limbs varied from hour to hour. Improvement from this time was progressive but very slow, and it was not until the fifteenth day of the illness (three days after completion of his five-day course of A.C.T.H.) that facial expression became normally mobile. Two days later the plantar responses had become flexor, and 48 hours after this he began to talk. He remained emotionally labile and inattentive for at least three weeks, and convalescence was prolonged.

Case 3

Severe measles encephalitis in a girl of 3½, with myoclonus, coma, hyperpyrexia, and death within four days of onset, after 36 hours' treatment with A.C.T.H.

Five days after the appearance of measles this child was noticed to be unusually quiet and to have apparent brief lapses of consciousness. During the next two days her condition deteriorated, with increasing drowsiness and occasional muscle-twitching. On examination at this time she was deeply stuporous, but resisted violent stimuli. She was febrile—100.2° F. (37.9° C.)—and generally hypertonic, with hyperreflexia, absent abdominal reflexes, and extensor plantar responses. Repeated myoclonic twitching was present in the left hand and foot. There was no meningism and the spinal fluid was entirely normal. A.C.T.H. and suitable sedatives were administered at once. Twelve hours later stupor had deepened to an unresponsive coma. Convulsive twitching was bilateral and continuous, shifting from one group of muscles to another. During the subsequent 24 hours these movements ceased except in both eyelids, all four limbs became flaccid, and death occurred in hyperpyrexia after an illness of four days' duration. Permission for necropsy was refused.

Comment

Cases of acute disseminated encephalomyelitis in association with rheumatic fever similar to Case 1 have been described by van Bogaert *et al.* (1932). Although these illnesses are clinically similar to para-infective encephalomyelitis of more familiar types, a rather different pathological basis has been described by Costero (1949), who found a diffuse cerebral angiitis of "hyperergic" type in fatal cases of rheumatic fever both with and without cerebral symptoms.

By comparison with Case 1 the two cases of measles encephalitis (Cases 2 and 3) were disappointing, especially as success has already been claimed for the use of A.C.T.H. in this condition (Ligterink, 1951). In Case 2 treatment was not begun until the fifth day of the disease, and, although admittedly the patient gradually recovered from this time onwards, there was no dramatic response to A.C.T.H.: the disease ran a course with which we are familiar in untreated cases, convalescence being protracted. Case 3 deteriorated rapidly in spite of treatment. This may well be considered to fall into the second group of cases which we have considered on theoretical grounds unlikely to respond to treatment—"the rapidly fatal encephalomyelitic illness of which the pathological basis is a diffuse cerebral purpura."

Disseminated Sclerosis

Eight acute episodes of disseminated sclerosis in seven patients have been treated with five-day courses of A.C.T.H., as shown in the Table. Each case satisfied the criteria already described. We had hoped that A.C.T.H. might cause rapid resolution of the acute lesions of the

Details of Cases of Disseminated Sclerosis

Case	Age and Sex	Duration of History	Apparent Provoking Factors	Clinical Features of Acute Episode	Background Disability	Results of Treatment
A1	27 M	2 years	0	Spastic weakness and paraesthesiae in right hand for one week	Spastic paraplegia. Difficulty in micturition. Ataxia	Disappearance of acute symptoms. Relief of spasticity and bladder disorder. No change in reflexes
A2	38 M	2½ "	0	Exacerbation of weakness of legs	As above	Relief of bladder symptoms only. Euphoria
B	38 M	10 "	0	Acute exacerbation of spastic paraplegia 6 weeks before. Later widespread painful paraesthesiae	Spastic paraplegia. Dysuria. Ataxia	Decrease of long-standing spasticity in right leg. No change in reflexes. Euphoria
C	49 M	6 months	0	Ataxia of gait, with flexor spasms in legs	Bilateral pyramidal signs. Paraesthesiae. Little weakness	No change. Euphoria
D	42 F	17 years	Febrile sore throat one week before	"Useless" left arm for 4 days	Spastic paraplegia. Dysuria. Ataxia	No change
E	33 M	9 "	0	Increasing spastic paraplegia and paraesthesiae for two days	Nil (complete previous remission)	" "
F	31 F	16 "	Common cold 23 days before	Spastic tetraplegia developing during a few hours	Spastic weakness of right leg	Aggravation of symptoms during treatment
G	20 F	4 weeks	0	Increasing weakness of legs for three days. Optic neuritis	Nil	Aggravation of symptoms during treatment. Euphoria (subsequent course of illness confirmed diagnosis)

disease, with concomitant improvement in symptoms. It seemed possible that the control of acute episodes might lessen permanent damage to the nervous system and so improve both immediate and long-term prognosis.

The results were, however, profoundly disappointing. The first patient treated appeared to respond (Case A1). His most recent symptoms—spasm and paraesthesiae in the right hand—resolved during the course of treatment, while bladder control was improved and spasticity reduced without change in the reflex signs. Several weeks later, however (Case A2), a second acute episode in the same patient was characterized by a rapidly developing exacerbation of paraplegia, ataxia, and recurrent bladder symptoms. This exacerbation proved entirely unresponsive to a similar course of A.C.T.H., with the sole exception that dysuria was again apparently improved. In no other case was improvement in acute symptoms observed. One other patient (Case B) showed a definite decrease in long-standing spasticity, while his more recent symptoms remained unchanged. Case G had acute visual impairment, but became dramatically worse during the five days of treatment. The one really striking effect of A.C.T.H., observed in four patients, was the rapid development of marked euphoria, sometimes with extravagant claims of subjective improvement in function for which no objective basis could be found. This euphoriant action is well known, and makes clinical assessment difficult, for a cheerful patient may make much more effort than a depressed one in such tests as those for muscular power.

It will be seen that the only definite benefits derived by these patients are among those enumerated by Glaser and Merritt—decrease in spasticity and improved bladder function. We must conclude from this small group of patients that A.C.T.H., given in physiologically adequate dosage over the course of five days, has no specific effect on the acute manifestations of disseminated sclerosis. There seems no reason to believe that cortisone would be any more effective. The place of A.C.T.H. or cortisone in maintenance treatment, with the aim of preventing fresh lesions, remains to be established.

Discussion

In all we have now treated 10 cases clinically diagnosed as acute disseminated encephalomyelitis with A.C.T.H., and the results are on the whole distinctly encouraging. Two cases followed measles, two varicella, and three respiratory infections; one occurred in association with acute rheumatic fever, and one after body-chilling, while the remaining illness developed apparently spontaneously (subacute necrotic myelitis). In seven patients marked improvement occurred during five-day courses of the drug, and in five instances quite unequivocal clinical improvement appeared within 12

hours of the initial injection of A.C.T.H. The two complete failures were in subacute necrotic myelitis and in the very acute measles encephalitis described above (Case 3)—cases which on theoretical grounds would seem very unlikely to respond. These illnesses tend, of course, to spontaneous and often dramatically rapid recovery, and we cannot yet be certain that the course of the illnesses was in fact altered by the administration of A.C.T.H. Nevertheless the evidence in favour of this view is very suggestive, and may perhaps be regarded as more so when it is observed that improvement occurred within twelve hours of instituting therapy in four of the six patients in whom treatment was instituted within forty-eight hours of the onset of neurological symptoms, but in only one of the four cases in which the symptoms were of longer duration. Such rapid improvement in early cases is entirely in keeping with the hypothesis on which this therapy is based (that acute disseminated encephalomyelitis represents a neurological analogue of urticaria or "anaphylactoid purpura"), and is surely the reverse of what might be expected did our case records represent the natural history of encephalomyelitic illnesses unaffected by therapy.

Consideration of these results suggests two further approaches. Clinically it would be of interest to observe the effects of the more rapidly acting intravenous cortisone or compound F on the severe acute encephalitic illnesses in this group. Secondly, observations on the possible therapeutic action of cortisone or A.C.T.H., as opposed to their verified prophylactic effect, in experimental "allergic" encephalitis might yield further information on what might be hoped for in dealing with the disease in man.

It appears, however, that while most cases of acute disseminated encephalomyelitis show definite clinical improvement during a five-day course of A.C.T.H., a similar course of treatment produces no effect on acute episodes of disseminated sclerosis. This finding permits of two possible interpretations. Either acute disseminated encephalomyelitis responds to A.C.T.H. and acute disseminated sclerosis does not, or neither disease is influenced by the treatment and the differences observed are inherent in the natural history of the two syndromes. Although we believe the second interpretation to be the less likely, it cannot be doubted that the two conditions are distinct. It has never been suggested that post-exanthematous or post-vaccinal encephalomyelitis develops into disseminated sclerosis. Nor have we ever encountered in disseminated sclerosis that dramatically rapid spontaneous resolution of gross neurological signs within hours or days which is a common occurrence in the patient with acute disseminated encephalomyelitis. Furthermore, follow-up studies of apparently spontaneous acute disseminated encephalomyelitis have shown that recurrence is unusual and that the prognosis

after survival of the acute illness is good (Thygesen, 1949; van Bogaert, 1950; Miller and Evans, 1953). That the ultimate prognosis of recovered neuromyelitis optica, which we regard as a variant of acute disseminated encephalomyelitis, is similarly favourable has been clearly shown by Scott (1952).

The differentiation of acute disseminated encephalomyelitis from acute disseminated sclerosis is therefore of much more than academic importance, but it may be very difficult in the acute stage. Both illnesses show signs of disseminated lesions in the neuraxis, both tend to occur in young adults, and both often follow non-specific infections, especially of the respiratory tract. In our experience the diagnostic criteria offered by McAlpine (1931) are invaluable, but the need for further study is demonstrated by the following recent case.

Seven weeks before admission to hospital a young man of 19 developed an acute influenzal illness, epidemic at the time in the Army camp in which he was serving, and associated in his case with quite severe pain in the left eye which lasted for three days. He recovered completely from his symptoms within a week, but seven days later vision in the left eye suddenly became blurred. Examination at this time revealed a unilateral retrobulbar neuritis with papillitis; there were no abnormal signs elsewhere. Sight in the left eye became normal within a week and the patient remained well until one month later, when he developed acute backache, followed by weakness and stiffness of the legs, constipation, and retention of urine. Examination at this time revealed some pallor of the left optic disk, nystagmus at the extremes of lateral gaze, and signs of a partial transverse lesion of the spinal cord in the mid-dorsal area, with loss of proprioceptive sensation in the feet and of impairment of superficial sensibility to the seventh thoracic dermatome. The spinal fluid contained 73 lymphocytes per c.mm., but was otherwise normal. Improvement from this lesion was rapid, and a mild spastic paraparesis with some left optic atrophy was at the time of writing the only evidence of his illness.

Was this a case of rapidly healing biphasic encephalomyelitis, showing some similarity to the syndrome of neuromyelitis optica, and with only slight danger of recurrence? Or must it be labelled as disseminated sclerosis, with all the sinister implications of that diagnosis? The answer to such problems seems less likely to depend on further refinements of clinical diagnosis than on the development of such ancillary aids as are suggested by the immunochemical studies of Kabat *et al.* (1948) or the refined colloidal gold reaction described by Lange and Harris (1949), which may ultimately furnish diagnostic instruments of critical importance.

Summary

Three further cases of acute disseminated encephalomyelitis personally treated with A.C.T.H. are reported, bringing the total of cases treated to 10. In seven patients marked improvement occurred during five-day courses of the drug, and in five of these unequivocal clinical improvement was observed within 12 hours of the initial injection of A.C.T.H. The two complete failures were in cases of subacute necrotic myelitis and catastrophic measles encephalitis. Improvement occurred within 12 hours in four of the six cases in which treatment was instituted within 48 hours of the onset of neurological symptoms, but in only one of four cases treated later in the course of the illness. This finding is regarded as a further indication that the course of the illness was favourably influenced by treatment.

Similar courses of A.C.T.H. were given during eight acute exacerbations of disseminated sclerosis in seven patients. Although euphoria was often present and improvement in chronic spasticity and bladder dysfunction occasionally observed (in keeping with results previously reported), acute symptoms showed no improvement comparable to that seen under similar conditions in acute disseminated encephalomyelitis.

The importance and the occasional difficulty of distinguishing between these two clinically similar but biologically distinct acute neurological syndromes are discussed and illustrated.

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CONSERVATIVE SURGERY IN THE TREATMENT OF ULCERATIVE COLITIS

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There is no doubt that the modern improvements in ileostomy bag design have relieved an ileostomy of some of its terrors, but, in spite of this and the reports of many patients who have returned to most of their former activities, it would be idle and false to pretend that the prospect of an ileostomy for the rest of life is one that does not bring dismay and gloom to those of finer sensibility. Many patients for whom an ileostomy is contemplated or performed are in their youth and in their early married and home life, and few can believe that such distortion of the normal channels of evacuation is likely to prosper that alliance and that household. It is surely right that surgical opinion should not accept the inevitability of permanent ileostomy combined with total colectomy and excision of the rectum as the routine surgical treatment of the disease without the fullest exploration of more conservative methods. Devine and Devine (1948), in a series of cases, have put forward a technique whereby the rectum is preserved and continuity of the intestinal track re-established; and Corbett (1952), working along similar lines, has reported successful cases. Both of these methods entail the full discharge of ileal content through an ileostomy that is retained for varying periods of time, but the method of continuity suggested in this paper, dependent as it is upon immediate ileo-pelvi-rectal anastomosis, carries no such disadvantage.

Those antagonists of any attempt to preserve rectal function contend that the inflammatory changes precept in the rectal mucosa continue in spite of removal of the rest of the colon and that the mucosa is unable to withstand the proteolytic effect of the ileal contents which are poured into it. Moreover, they regard the possibility of cancerous change in the remaining portion of the bowel as a very real one, and in the event of existing

complications of the disease being present, such as arthritis or pyoderma, they believe that these are not cured so long as a portion of the large bowel remains.

In certain cases, at least, it is doubtful whether these fears are real, and it is still more dubious whether they should prevent the surgeon from an attempt at restoration of continuity of the bowel. Devine and Devine have described the regression of the acute inflammatory change in the rectum, once its connexion with the colon has been severed, so that the mucosa returns practically to its original state, and my own experience supports this view. That the rectum and anal canal can withstand the proteolytic action of small-intestinal content has been proved to my satisfaction by my experience with anastomosis of the small intestine to the rectum for other conditions (Aylett, 1951, 1952), so that this consideration, too, cannot be held as a bar to attempts at functional restoration.

Suitable Cases

In the type of case upon which a conservative operation is proposed, the possibility of cancerous change in the remaining rectum is not a real one. Counsell and Dukes (1952) have shown that in ulcerative colitis cancerous changes occur either in association with a dense fibrous-looking stricture or as a result of malignant changes supervening in true adenomata. The common inflammatory pseudo-polyps and oedematous mucosal tags are not pre-malignant and may disappear completely with the amelioration of the disease. Where the rectum is studded with true adenomata the nature of which will be revealed by pre-operative biopsy examination, or where, in the course of sigmoidoscopic examination, stricture formation is identified in the portion of the bowel it is proposed to retain, any consideration of conservative surgery must naturally be abandoned in favour of an ileostomy with complete removal of the colon and rectum. In the absence of such changes, even though the typical acute inflammatory appearances with pseudo-polyps are obvious, I consider that the operation should be planned with a view to retention of the rectum.

Of the five cases reported below, one had a severe pyoderma. In this case at least, the condition resolved completely, and the return of the rectal mucosa to a normal appearance encourages us to believe that other extra-bowel lesions may resolve in a like manner, with a conservative operation retaining rectal function.

It is not within the scope of this paper to consider the numerous indications for surgical intervention in this disease, but if conservative surgery is to be contemplated it is essential that stricture formation in the rectum and the lowermost part of the colon shall be absent. In dealing with the case that is under prolonged medical treatment the closest co-operation between physician and surgeon is therefore essential, so that operation shall not be delayed until this complication has developed. It is only by sigmoidoscopic examination that the early stage of bowel changes likely to go on to stricture formation can be recognized, and this investigation must therefore be carried out at frequent intervals throughout the patient's illness. Distensibility of the rectum and colon is at all times diminished in cases of ulcerative colitis, as the normal elasticity of the bowel is reduced by the oedema and inflammatory changes that affect all its layers, but the start of actual stricture formation is suggested when the sigmoidoscope feels held or gripped at any level of the bowel within the scope of the examination, or if the wall feels thickened and unduly taut. In all such cases medical treatment should be abandoned in favour of surgery, as, if the former is prolonged, stricture formation will develop and retention of a functioning rectum will be impossible.

A conservative operation will also be out of the question if perirectal abscess and fistula formation is present,

but if the disease is regarded as one in which both physician and surgeon have an equal interest, and one in which operation does not carry the inevitability of permanent ileostomy, then the disease is unlikely to be allowed to reach the advanced stage before surgery is undertaken. Finally, the prospect of the retention of rectal function, by overcoming both the patient's disinclination to submit himself to an operation which is to result in a permanent ileostomy and the physician's natural reluctance to advise such a procedure until the very last, may help to avoid the "Belsen" type of case in which any operation must carry an appreciative mortality.

Operative Technique

The abdomen is opened through a left paramedian incision and the ileum divided close to the caecal valve. Both free ends are closed, and the proximal end is anastomosed to the pelvi-rectal region of the colon by side-to-side anastomosis.

The colon is then divided about 2 in. (5 cm.) above this site and the free ends are brought out on to the skin surface in the left iliac fossa (Fig. 1).

The patient is thus left with an end of the colon, a little above the anastomosis, opening on to the surface of the abdomen. This provides a safety-valve effect, so that any pressure, the result of the accumulation of intestinal content or flatus in the rectum, which might be sufficient to break down the anastomosis between the ileum and the colon is prevented from developing, as the contents will discharge through the colostomy before enough tension to produce damage has been built up. In actual practice, although considerable quantities of flatus are passed, the amount of ileal content that escapes on to the abdominal surface is not great and has not been sufficient to produce excoriation of the skin. Nevertheless, I feel sure that the absence of any suggestion of a leakage in my cases at the anastomotic site has been due to the safety-valve effect of this colostomy, and that an intraperitoneal anastomosis carried out through grossly diseased bowel wall without this device would be fraught with great danger of leakage. The idea of decompression of the bowel by this method was first introduced by Muir (1947), who employed the technique when carrying out a right hemicolectomy.

In two of the five cases recorded below the condition of the patient at the completion of the ileo-pelvi-rectal anastomosis was good enough to enable the colectomy to be carried out at the same operation, so that only the distal free end of the colon was drawn out on to the surface of the abdomen. The general condition of most patients, however, would not permit of this, and the colectomy must be delayed until sufficient improvement has been achieved as a result of the ileocolostomy.

Closure of the safety valve some three to four weeks after the initial operation is the next step in the planned treatment of the condition. By this time the anastomosis will have united soundly, and there is then no need of the safety-valve effect. Moreover, it is best that this should be closed before the abdomen is reopened to remove the colon, as the risk of faecal contamination of the abdominal wound is thereby reduced. In Case 5 of the series reported, however, it was necessary to carry out the colectomy before the closure of the colostomy, as, after a period of great

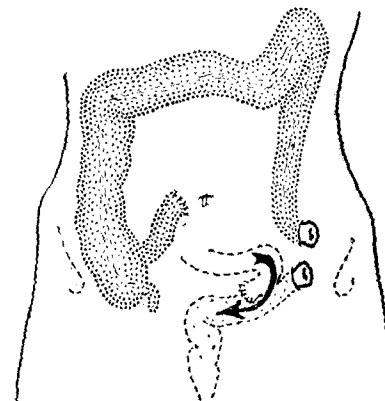


FIG. 1.—The final altered anatomy, with the distal ends of the colon exteriorized.

improvement in the child's general condition following the first operation, deterioration began as a result of constant haemorrhage from the isolated colon. Colectomy was the final stage of operation in the remaining two patients. (Fig. 2.)

The progress of all patients after the ileocolostomy has been absolutely smooth and there has been no anxiety with regard to saline or fluid unbalance. Until a return of peristalsis, intravenous therapy has been continued, but, apart from an immediate post-operative blood transfusion, no continuance of this form of therapy has been necessary, even in those who, prior to the operation, needed weekly blood transfusions to maintain a normal blood picture.

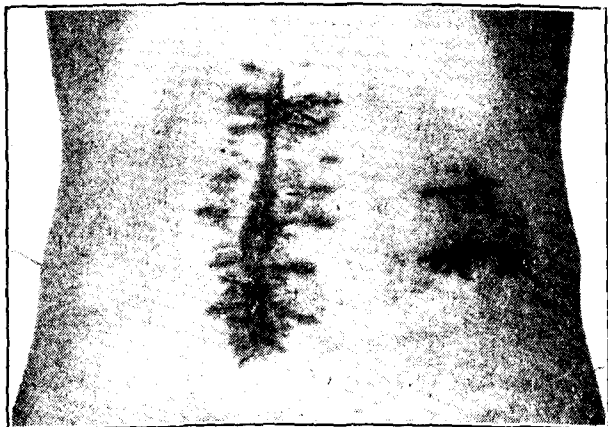


FIG. 2.—The colectomy has been completed and the safety-valve colostomy closed. The photograph is that of a child aged 10 years.

The safety-valve colostomy discharges about the third day and ileus has never been severe enough to necessitate gastric suction. Once the bowels start to function, a day or two after the colostomy has acted, the discharge from this becomes steadily less.

The improvement in the general condition of the patient is rapid. Appetite and well-being return; fever and toxæmia disappear as quickly as after an ileostomy, and the emaciated patient puts on weight.

Case Reports

Case 1.—A woman aged 30, was admitted in November, 1951, with acute ulcerative colitis supervening upon a chronic condition of 19 years' standing. Bleeding and toxæmia were severe. In spite of all forms of treatment the condition deteriorated. Sigmoidoscopy showed appearances typical of an acute stage of the condition, with changes extending right down to the anal canal. The mucinase activity of the faeces was 400 units and the pre-operative weight was 6 st. 5 lb. (40.4 kg.). Ileo-pelvi-rectal anastomosis was carried out in February, 1952. The relief of symptoms and improvement in general condition were rapid. Colectomy was postponed until September, 1952. Before it was undertaken proctoscopy revealed a rectal mucosa that appeared normal. The ulcerative condition had completely disappeared. At the final operation the outward appearances of the distal segment of the colon and the upper rectum were seen to have changed dramatically. The sodden and inflamed bowel found at the initial operation had resolved and, with the exception of a slight thickening, appeared normal. The mucinase activity in the stool at the time of the final discharge was nil and her weight was 7 st. 11 lb. (49.4 kg.). The bowels were opened eight times in the 24 hours, and she was completely continent.

Case 2.—A man aged 46 was admitted in March, 1952, with a two-years history of ulcerative colitis. He had been in hospital elsewhere for the previous six months. Recently diffuse pyoderma of his face and neck had developed. Mucinase activity of the stool was 416 units. The bowels

were opened every two hours and there was a loss of weight of about 2 st. (13.2 kg.). His pre-operative weight was 8 st. 6 lb. (53.5 kg.). In view of failure to respond to medical treatment, operation was undertaken in April. Colectomy was carried out at the time of the pelvic anastomosis. Before discharge six weeks later the mucinase activity had fallen to 83 units. By September his bowels were being opened twice in the 24 hours, the pyoderma had subsided, and there was a weight gain of 17 lb. (7.7 kg.). The patient remains well. The ulceration of the rectal mucosa has healed entirely and with the exception of some oedema the mucosa appears normal.

Case 3.—A man aged 44 was admitted in March, 1952, with a seven-years history typical of ulcerative colitis. He had been in and out of hospital on numerous occasions, and in the acute attacks the rectal discharge necessitated visits to the toilet every 20 minutes. Sigmoidoscopy revealed changes of acute ulcerative colitis involving the rectum. The present attack failed to respond to medical treatment and anastomosis was carried out in May. The colectomy was completed in June. The patient's improvement was rapid. In September his bowels were opened eight to ten times a day and he was completely continent. He had gained 7 lb. (3.2 kg.) in weight, was fit and well, and was back at work. Rectal examination revealed a mucosa that was more oedematous than normal and which tended to bleed on pressure with the end of the proctoscope. The acute inflammation, with pseudo-polyposis formation present pre-operatively, had entirely disappeared. No blood was present in the stool.

Case 4.—A girl aged 10 was admitted in March, 1952, with a two-years history of periodic diarrhoea and blood in the stools. The haemoglobin on admission was 78%. Sigmoidoscopy and barium-enzyme examinations showed appearances of acute ulcerative colitis. The mucinase activity of the stool was 125 units. In spite of medical treatment the child's condition deteriorated steadily and multiple transfusions were required. At one time the haemoglobin fell rapidly to 46%. Blood-stained purulent discharge from the anus was almost constant, and operation was delayed only on account of the child's age. In September it seemed apparent that without operation she would die, and the anastomosis was therefore carried out. The improvement in her condition was dramatic. Three weeks later there was severe haemorrhage from the colostomy communicating with the isolated colon, and this continued. Colectomy was therefore carried out, and since that date her improvement to normal health has been uninterrupted. The mucinase activity of the stool is nil, and the rectal mucosa appears normal. The safety-valve colostomy has since been closed. There were six bowel actions in the 24 hours.

Case 5.—A woman aged 42 was admitted in July, 1952, with a 13-years history of chronic ulcerative colitis with acute exacerbations. She had been in hospital on numerous occasions. Recently there had been a steady decline in general health, constant blood-stained stools and discharge, and loss of weight. Sigmoidoscopy revealed typical changes of the condition down to the lower rectum, and barium-enzyme x-ray examination showed the terminal ileum to be involved. Ileo-pelvi-rectal anastomosis with colectomy and removal of the terminal 2 ft. (60 cm.) of small intestine was therefore undertaken. Since operation the general improvement has been great. The patient has put on 13 lb. (5.9 kg.) in weight and is in normal good health. She is completely continent, although the bowels are opened 10 times in the 24 hours. Blood is absent from the stool, and the pseudo-polyposis visualized and demonstrated by biopsy before operation has subsided.

Comment.—In the fulminating case of ulcerative colitis associated with perforation the same sphincter-preservation should be aimed at. Such cases should be especially suitable for this type of operation, as the pathological changes occurring in the lower colon and rectum are acute and likely to be completely reversible. The general technique,

however, requires modification in view of the desperate condition of the patient. It is useless to attempt suture of the perforation, as the stitches will fail to hold in the diseased bowel wall, and, in any case, further perforations are usually impending at other sites in the colon. The caecum and colon as far down as the lower third of the pelvic colon must be excised, the distal end of the latter being brought out as a colostomy. Anastomosis of the ileum to the pelvi-rectal region would add a further quarter of an hour to the operation, and as the patient is unlikely to withstand this prolongation of operative time the severed end of the ileum is brought out as an ileostomy. Restoration of continuity of the bowel is delayed until the patient has fully recovered from the initial operation.

Discussion

I cannot agree with Counsell and Goligher (1952) in accepting the possibility of malignant change in ulcerative colitis as the dominating consideration in its surgical management. When true adenomata or stricture formation are present, then there is no question of the nature of the surgery that must be undertaken, but to advocate the removal of the rectum to prevent the formation of cancer when there is no certainty of its development is, I consider, too radical advice. The five specimens concerned in this article have been searched for cancer change and none has been found. It is unlikely to exist in the residua of the large bowels which have been retained, in view of the great improvement in the patients' general condition and the subsidence of the inflammatory changes, confirmed by proctoscopy. That the disease may recur in the rectum is a possibility, but the short follow-up of the present series has shown, so far, no indication of such a relapse. Even should a proportion have a return of symptoms, the establishment of an ileostomy and the excision of the rectum and terminal colon is no great surgical feat, and it can surely be reserved for those for whom it is a necessity rather than condemn all and sundry to a permanent ileostomy.

I have remarked on the noticeably smooth post-operative recovery of these patients, and from my own experience with ileostomies I have no doubt whatsoever about which is the easier. On this ground alone the operative mortality is likely to be very much less than the considerable mortality that accompanies ileostomy, and is an added argument in its favour.

Frequency of bowel action is unavoidable, but it is a small price to pay to escape an ileostomy life. In the second patient reported in the series the caecum appeared only mildly affected with the disease, and it, instead of the small intestine, was anastomosed to the pelvi-rectal junction. This patient has only two actions a day, and that this modification can be applied in other cases with advantage is a possibility.

Summary

The preservation of the rectum and of the normal channel of evacuation is advocated in those cases of ulcerative colitis in which fibrosis, pelvi-rectal suppuration, or true adenoma formation is absent from this part of the large intestine.

A method whereby this can be carried out without a preliminary ileostomy is described. The ileum is divided and its proximal end is anastomosed to the pelvi-rectal region. The colon above the site of the anastomosis is cut across and both free ends are exteriorized. The distal colostomy opening is subsequently closed and colectomy performed.

Immediate subtotal colectomy is advocated as the operative method of choice in the fulminating case.

Cases are reported in which a return to good health has followed treatment by the methods described.

I would like to thank Dr. E. R. Cullinan, in whose charge these patients have been, for his collaboration and advice in this work; Dr. C. B. Lewis, who has been responsible for the anaesthesia in these cases; and the nursing and resident staff of the Gordon Hospital for their unfailing care and attention to the patients.

Since this paper was prepared the initial stages of the operation have been successfully carried out in four other patients. One of these now has her bowels open three times a day only.

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PHLEGMASIA CAERULEA DOLENS

BY

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Phlegmasia caerulea dolens occurs in the limbs as a result of what would appear to be complete or almost complete obstruction to the venous outflow. It is of sudden onset, and is often associated with extreme cyanosis, swelling, pain, and shock, resulting in circulatory stasis of such a degree that gangrene follows in approximately a half of all cases.

The condition is rare, but has attracted much attention, particularly in France, and has been called variously pseudo-embolic phlebitis, blue phlebitis (Grégoire, 1938), and gangrenous thrombophlebitis (de Vega and Andrés García, 1946). DeBakey and Ochsner (1949) suggested the name phlegmasia caerulea dolens, and this seems an adequately descriptive term. Since then further cases have been reported (Clain and Nussbaum, 1950; Haimovici, 1950; Veal *et al.*, 1951; Miles, 1951; Turner, 1952).

Causation

The condition may occur when the main vein of a limb is suddenly obstructed. Veal *et al.* described cases that resulted from prophylactic ligation of the inferior vena cava in ilio-femoral thrombophlebitis with or without embolism, and I have seen the most alarming cyanosis and swelling after ligation of the common iliac vein for repeated embolism.

On account of repeated pulmonary embolism a man aged 63 had the common iliac vein ligated, thrombosis being present in the femoral vein. The following day he was moderately shocked and complained of severe pain in the thigh and leg. The affected leg was grossly swollen, intensely cyanosed, and much colder than its fellow, the distal pulses being hardly felt. The leg was elevated to 45 degrees and reflex heating and tolazoline hydrochloride were given; within three hours the swelling had practically disappeared and a full bounding pulsation was felt in the dorsalis pedis and posterior tibial vessels.

More usually it would seem to follow thrombophlebitis, occurring spontaneously or after operation, or in the puerperium, or as a result of pressure or invasion of a vein by neoplasm, or in association with blood disease.

A woman aged 54 was admitted to hospital with a thrombophlebitis of the right leg. She had suffered from attacks of phlebitis in the right leg during the thirty months prior to admission, and two and a half years previously had had a splenectomy, at another hospital, for a supposed Banti's syndrome. She was treated in hospital with penicillin, heparin, and dicoumarol, but, as a result of haemarthrosis and epistaxis, anticoagulants had to be stopped. Five weeks later there was a sudden onset of severe pain, swelling, and cyanosis of the right leg.

On examination the patient was seen to be severely shocked, the right leg was intensely swollen and cyanotic up to the knee, and the distal half of the leg was cold and pulseless. The femoral pulse was palpable, but more distal pulses were not felt. A diagnosis of embolus was considered, but no origin was apparent, and it was thought that the ischaemia was the result of a massive venous obstruction.

Conservative treatment by elevation, reflex heating, and tolazoline hydrochloride was instituted, but after three days it was obvious that a patch of tissue in the sole of the foot was gangrenous. The swelling gradually subsided and the cyanosis diminished slightly. Investigation of the blood showed a polycythaemia vera, which was treated by radioactive phosphorus. After five weeks the gangrenous area, fortunately small and superficial in extent, sloughed and distal pulses became palpable. However, cyanosis and moderate swelling persisted and it became evident that all the superficial veins of the limb were thrombosed, and that there was a thrombosis of the inferior vena cava.

Six months later the patient was getting about, with the legs bandaged to control the swelling, and the pulses were all normal, a foot plethysmograph at this time showing a greatly diminished but adequate flow in the right foot with no response to reflex heating, thus indicating venous obstruction of such a degree that no reserve blood flow was available.

Massive venous thrombosis as a result of polycythaemia vera in this case caused such a degree of venous obstruction as to jeopardize the life of the limb. Swartley *et al.* (1942) reported a case occurring in an upper extremity, resulting in gangrene of the forearm.

Why only a minute proportion of cases of thrombophlebitis are followed by this train of alarming symptoms is not at present understood, and there are certainly other factors concerned apart from venous obstruction from thrombophlebitis.

Clinical Features

Clinically, the onset is one of dramatic suddenness and is associated with severe pain, sometimes of the greatest intensity. At the same time there is marked swelling of the limb, associated with shock which may even be fatal, and cyanosis occurs which varies greatly in degree, but which may be almost black. The arterial pulse may not be detectable in the distal parts, and the swelling of the limb will render its detection even more difficult. The limb rapidly cools off, and the appearances are similar to those of arterial embolism; this has led to exploration of the femoral artery on a number of occasions (Audier, 1935; Wertheimer and Frieh, 1935; Lindgren, 1937; and Sackenreiter, 1940). Gangrene may ensue, and may be of any degree from a superficial necrosis to a massive death of tissue demanding major amputation which is fatal in 25% of cases. On the other hand, the condition may settle down slowly, the swelling and cyanosis gradually disappearing, and the limb circulation returning almost to normal with or without a post-phlebotic syndrome of varying degree persisting. Sometimes recovery is as sudden as the onset, and it may be partial or complete. Death may occur at the onset from shock associated with loss of fluid into the affected limb and excessive pain, or it may occur later on as a result of gangrene. Pulmonary embolism is a common complication. There seem to be two main varieties, either swelling and cyanosis or arterial symptoms predominating, the latter simulating embolism. More often the types are mixed and there are signs of both venous and arterial occlusion.

It has been shown experimentally (Audier and Haimovici, 1938) that gangrene due to venous obstruction in an organ can be produced only if every vein draining that organ is ligated—in other words, if there is complete venous obstruction—and it may be that in some cases which proceed to massive gangrene this is in fact the mechanism. If this were so, recovery would seem impossible and recanalization could not occur in time to prevent massive death of tissue.

Illustrative Cases

As in fact most cases recover to a greater or less degree—sometimes with no loss of tissue, sometimes with minor gangrene—it seems to me that factors other than total venous obstruction must be significant in this syndrome.

A man aged 67 developed, on the fourth day after a partial gastrectomy, a sudden intense swelling of the left lower extremity up to the level of the groin, and the swollen limb became deeply cyanotic. He was severely shocked, and examination showed a palpable femoral pulse but no distal pulses, and the whole limb was much cooler than the unaffected limb. The next day, after a sudden pain in the chest, the patient died. Post-mortem examination revealed a pulmonary embolus as the immediate cause of death, and the affected limb showed a recent acute thrombophlebitis of the internal saphenous vein, the result of an infusion into this vessel, with no evidence of thrombosis of any other vein, and with no obstruction to the arterial tree.

In this case it seems that an acute superficial thrombophlebitis may have induced a spasm in either the veins or the arteries, or in both the veins and the arteries, of the limb, resulting in cessation of the circulation.

De Sousa Pereira (1946) found that where an isolated segment of vein is the site of thrombophlebitis there is accompanying venospasm extending far beyond the vein affected, and that this spasm can be relieved by anaesthesia of the vein wall or by interruption of the efferent pathways of the sympathetic chain. That veins can go into very effective spasm will be agreed by anyone who has had the experience of intravenous therapy or of operations on veins. Even varicose veins, where muscular walls are atrophied and often largely replaced by fibrous tissue, may be seen to contract.

Diminished oscillations of an artery in close proximity to a vein which is the site of thrombophlebitis has been demonstrated by DeBakey *et al.* (1939), and the association of arterial spasm with deep thrombophlebitis has been emphasized by Boyd (1947). Sutton (1952) reported a case of spasm of the brachial artery of such a degree as to render the hand and fingers bloodless after an intravenous infusion into the superficial median basilic vein at the elbow.

A woman aged 25, thirty weeks pregnant, was admitted to hospital complaining of a cramp-like pain in the left leg on movement. On lying in bed there was a dull ache in the limb together with a feeling of numbness. The limb was pulseless from the femoral artery downwards, there was a patchy cyanosis, and both leg and foot were cold. Sensation was normal and the toes could be moved voluntarily. The picture suggested an embolus, but there was no apparent origin for this, and the case was treated conservatively. Among other procedures, heparin was given via intravenous saline drip. On the third day, while I was examining the patient, she had a rigor, and the most remarkable change came over the affected limb, the cyanosis being replaced quite rapidly by an intense hyperaemia, the pulses throughout the limb becoming full and bounding, and the temperature of the limb gradually becoming higher than its contralateral fellow. Two weeks later the only abnormality was a mild post-phlebotic syndrome.

It seems that in this case an idiopathic deep thrombophlebitis initiated a severe degree of arterial spasm. No doubt sudden rigor was the result of impurities in the heparin and saline drip, and gave rise to a functional sympathectomy which itself "released" the spasm. Dissection of amputated limbs and post-mortem specimens has shown an apparently healthy arterial tree without any evidence of obstruction, though limbs removed by delayed amputation may show the distal arteries close to the gangrenous area filled with thrombus.

Discussion

In phlegmasia caerulea dolens the disappearance of the arterial pulse may be due to a reflex arterial spasm initiated by an irritative thrombophlebitis. On the other hand, when there is oedema and swelling of an extremity resulting from venous obstruction the digital pulse may become impalpable. In fact, in such a limb oscillations recorded by a sensitive galvanometer may be completely masked in spite of a normal blood flow. Clinically, therefore, disappearance of the distal pulses may not necessarily indicate any active spasm of the arteries, especially in those cases in which the swollen cyanotic type of affection predominates. There is no doubt that massive thrombosis of all, or the vast majority, of the veins of the limb results in gangrene, but in those cases in which recovery takes place partial venous obstruction by

thrombus is rendered temporarily complete by an associated spasm of the remaining veins in the limb. At the same time there may be some degree of arterial spasm as well, and it is these several factors, varying in degree, which give rise to the different clinical varieties.

The condition may well be of medico-legal importance, for the development of gangrene in a limb following operation for varicose veins does not necessarily mean that the main artery or even the main vein has been tied.

Much of the treatment is indicated by the pathology. Heparin should be given to achieve and maintain a clotting-time of 15 to 20 minutes, and associated shock is treated by transfusion and other methods. The affected limb should be elevated to an angle of at least 45 degrees to take the best advantage of gravity, and, if the patient's general condition allows, supervised active exercises should be vigorously pursued.

Veal *et al.* recommended this treatment in all cases, and considered that any sympathetic release should be avoided, as it increases the embarrassment of an obstructed venous system. They also stated that if the condition follows ligation of a main vein the ligature should be removed immediately.

If, however, the argument is accepted that the obstruction to the venous drainage is to some degree functional, then it would appear advisable to try to break this reflex by a method of sympathetic release, and, as I have indicated above, it seems to me that there must be a large measure of spasm, at least in those cases which have a chance of recovery.

In a heparinized patient any sympathectomy by resection or by paravertebral injection is dangerous and very likely to produce a retroperitoneal haematoma, and should therefore be avoided. A quite adequate sympathectomy can readily be achieved by means of heat applied to the trunk and unaffected limbs, liberal doses of alcohol, one of the best available vasodilators, and the induction of deep sleep with soluble amylbarbitone in doses of 3 gr. (0.2 g.) hourly until the patient is difficult to rouse, or liberal doses of morphine if pain is severe. This is a regimen appreciated by patients, and it has the advantage of allaying anxiety, besides achieving its effect on the sympathetic. The affected limb should be kept at room temperature, as should any limb threatened with gangrene, and intra-arterial tolazoline may be tried, although I have not been very greatly impressed with this procedure, and my own preference is for the intravenous route in urgent cases. As soon as the patient is fit enough, the elevated limb should be exercised actively several times a day under the supervision of a physiotherapist. In many cases the swelling resolves, the pain is relieved, and the circulation returns, often rather suddenly, in whole or in part. If return of circulation is incomplete, massive or superficial gangrene may result. Pulmonary embolism is a common danger, but heparinization will tend to prevent this complication. In the event of minor or major gangrene developing, removal of tissue (or amputation) should be restricted to the dead part, since the circulation in the surviving proximal segment has always completely recovered before the need for ablation of dead tissue arises.

Summary

The association of acute ischaemia or even gangrene with thrombophlebitis of the extremities is discussed, and the name phlegmasia caerulea dolens is considered to be adequately descriptive.

The different clinical manifestations are described.

The mechanism of the ischaemia is considered, and a theory advanced to account for the varieties.

Treatment is described in outline.

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SURVIVAL OF TRANSFUSED RED CELLS IN SCURVY

BY

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The pathogenesis of the anaemia of scurvy is obscure. One view is that the mechanism may be inadequate haemopoiesis due to deficiency of vitamin C. Vilter *et al.* (1946) and others have suggested that there may be a haemolytic process.

The theory of haemolysis has been based on the occurrence of reticulocytosis and abnormally high serum bilirubin and faecal and urinary urobilinogen values in patients with scurvy and anaemia. These findings are not necessarily due to haemolysis. A more reliable indication may be obtained by studying the fate of transfused red cells. As search of the literature has not revealed any report of such an investigation in scorbutic patients, studies of the survival of transfused cells have been made in eight patients with scurvy and anaemia and in one with scurvy but without anaemia.

In six of these patients the transfused red-cell survival time was greatly reduced, and this was interpreted as evidence of a haemolytic process.

Material and Methods

Eight adult male patients (seven Bantu and one Indian) who manifested severe scurvy and anaemia with normoblastic bone marrow have been investigated. The ninth patient, an adult male Bantu, was scorbutic but not anaemic. For some time before admission to the Groote Schuur Hospital these patients had been on a diet severely deficient in vitamin-C content, consisting almost solely of mealie meal (maize) and white bread. All presented the classical picture of scurvy, with spongy haemorrhagic gums, follicular hyperkeratoses, and intramuscular haematomata. There were no signs of any other disease.

The investigation of the eight anaemic cases was divided into four stages as follows:

(1) Initially the patient was kept at complete rest in bed, without any medication and on a diet entirely lacking vitamin C (mealie meal porridge without milk or sugar, stamped mealies, white bread without butter or jam, and black tea and coffee).

(2) After the short control period of rest in bed, the patient was given one transfusion of citrated bank blood which had been stored for at least 36 hours. Between 2 and 4 pints (1.1 and 2.3 litres) of blood were given in each case according to the degree of anaemia. The vitamin-C content of the blood used in each transfusion was not determined, but the average vitamin-C content of 8 pints (4.5 litres) of blood, taken and stored for 36 hours under the same conditions

as the transfused blood, was found to be 1.45 mg. per 100 ml. The vitamin-C-free diet was maintained during this stage.

(3) Between 8 and 18 days after transfusion the patient was given by intramuscular injection 500-1,000 mg. of ascorbic acid daily for a period of 6-10 days while still receiving the vitamin-C-free diet.

(4) Finally, the patient was given a full diet.

In Case 5 the investigation had to be curtailed because he developed chest pain, possibly due to pulmonary embolism. He was therefore given vitamin C on the third post-transfusion day.

In the non-anaemic patient a blood transfusion was given on the day of admission to hospital without a preliminary period of observation. He was investigated for six days thereafter whilst kept in bed on the vitamin-C-free diet without any other medication. On the seventh day he demanded his discharge. He was given 1,000 mg. of ascorbic acid intramuscularly and a full diet; he was subsequently seen as an out-patient.

The red-cell survival times were determined by the Ashby technique, using potent anti-A and anti-B sera (Mollison, 1951). In Case 6, with blood group O, powdered anti-M serum in the form of powdered globulin was used. The estimations of survival times were made either daily or on alternate days. In Cases 2 and 3 the estimations were made on capillary blood. In the other seven cases venous blood was used. In each estimation at least 2,000 cells were counted.

Whilst the patients were on the control diet every possible precaution was taken to prevent them from receiving extraneous sources of vitamin C, apart from the ascorbic acid given by injection and the small quantity in the transfused blood. In error Case 6 was given a glass of sour milk on the sixth day after transfusion, but no other breach of the strict dietary control is known to have occurred.

No other medication was given at any stage except that Case 4 received one injection of 25 mg. of A.C.T.H. on the 18th day after transfusion for the purpose of testing adrenocortical function. This patient bled severely on that day and was immediately given a second blood transfusion; in all other cases only one transfusion was given. As part of another investigation four cases (Nos. 2, 5, 7, and 9) received an intravenous injection of the sodium salt of para-aminohippurate; in addition Cases 2 and 5 received an injection of sodium thiosulphate, whereas Cases 7 and 9 were given inulin.

Results

The Table shows blood findings in each patient before and after transfusion, before vitamin-C therapy, and on discharge. Figs. 1 and 2 show the red-cell survival times for the nine cases.

In Cases 2, 5, and 8 the red-cell survival could not be regarded as being abnormal. In Case 2 the survival-time curve was normal except that the red cells seemed to disappear rapidly at a stage one week after the beginning of vitamin-C therapy. Cases 5 and 8 were followed for only three and six days respectively before being given vitamin C.

In the remaining six cases (Nos. 1, 3, 4, 6, 7, and 9) the transfused red-cell survival times were much shortened. The effect of administering vitamin C in these six cases was as follows. In Cases 3, 6, and 7 the abnormal degree of red-cell destruction diminished coincidentally with the administration of ascorbic acid as indicated by the flattening of the red-cell survival curves. In Cases 1 and 9 the increased rate of destruction persisted for two to three days after ascorbic acid therapy was started. Case 4 was investigated for 18 days before ascorbic acid was given. On the 18th day he bled severely from nose, mouth, and gums, and required a second blood transfusion. An injection of 25 mg. of A.C.T.H. had been given on that day to assess adrenocortical function. The increased rate of disappear-

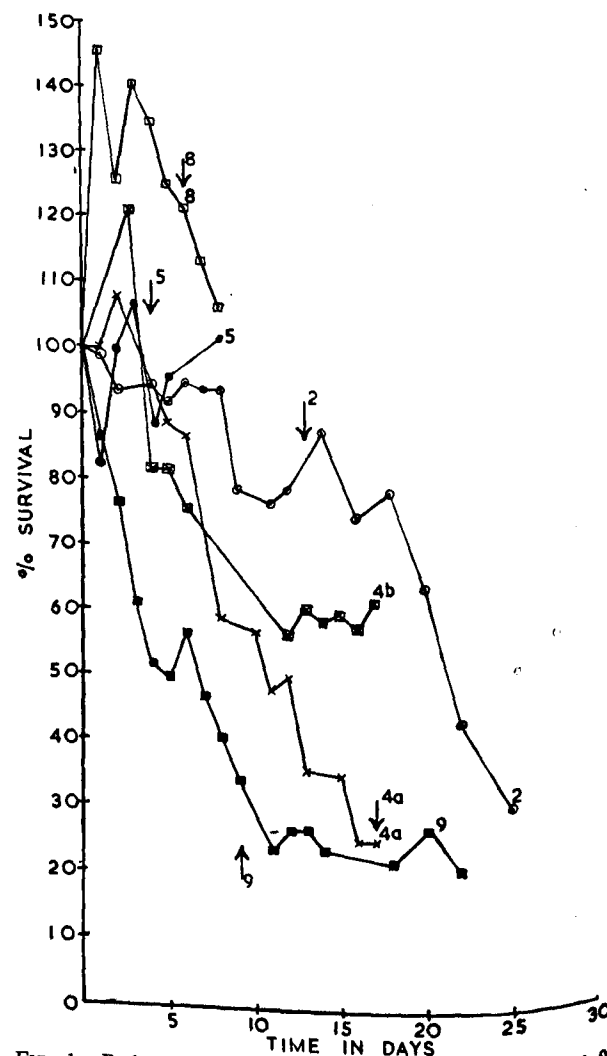


FIG. 1.—Red-cell survival curves for Cases 2, 4, 5, 8, and 9. Case 4 received two transfusions. The arrow indicates the beginning of treatment with ascorbic acid.

Blood Findings

	Case 1		Case 2		Case 3		Case 4, a		Case 4, b		Case 5		Case 6		Case 7		Case 8		Case 9	
	Hb %	Transfused Cells %	Hb %	Transfused Cells %	Hb %	Transfused Cells %	Hb %	Transfused Cells %	Hb %	Transfused Cells %	Hb %	Transfused Cells %	Hb %	Transfused Cells %	Hb %	Transfused Cells %	Hb %	Transfused Cells %	Hb %	Transfused Cells %
Before transfusion ..	54	0	38	0	80	0	72	0	41	24	51	0	51	0	22	0	90	0	30	0
After ..	64	100	66	100	97	100	68	100	73	100	76	100	91	100	56	100	105	100	53	100
Before vit. C ..	63	49	89	80	104	44	41	24	—	—	79	89	58	60	39	54	100	122	43	41
Last observation ..	89	37	96	30	98	36	—	—	95	62	85	102	88	35	67	38	100	107	82	21
Day vit. C started ..	10		13		13		18		0 (18)		3		10		10		6		8	
Day of last observation	28		25		22		—		25 (44)		8		30		34		12		22	

ance of the donor cells continued after haemorrhage ceased, and the red-cell survival curve did not flatten until 9-10 days after the beginning of ascorbic acid therapy.

Haemoglobin values were determined in each case *pari passu* with the estimation of volume of packed red cells.

Of the six cases in which there was rapid disappearance of donor cells, four (Cases 4, 6, 7, and 9) showed a fall of haemoglobin simultaneously with the decrease in volume of packed red cells, whilst in Cases 1 and 3 the haemoglobin did not drop below the immediate post-transfusion level. It is noteworthy that in Cases 4 and 9 the fall of haemoglobin and packed cell volume occurred despite a great increase of reticulocytes.

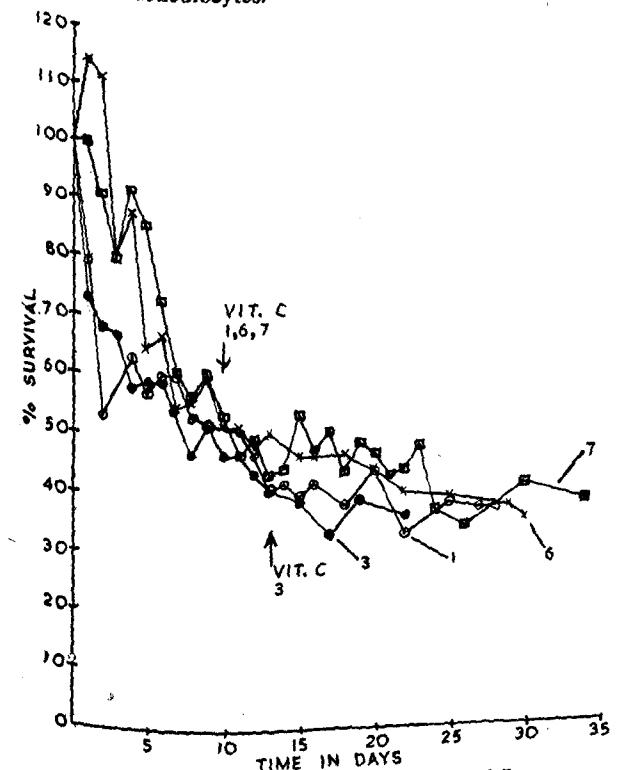


FIG. 2.—As for Fig. 1. Cases 1, 3, 6, and 7.

Of the three cases (Nos. 2, 5, and 8) in which the red-cell survival times were found to be normal, the one which could be followed adequately (Case 2) had haemoglobin above the post-transfusion level. In this patient there was a marked reticulocytosis on the day of transfusion and for several days thereafter. This could be attributed perhaps to rest in bed or possibly to some intake of vitamin C a few days previously of which no history could be obtained. The degree of anaemia in Cases 2 and 5 before transfusion was as severe as that of patients in whom the red-cell survival was very much reduced.

All the patients were Rh-positive. The direct and indirect Coombs tests were negative in every case. All recovered completely and were discharged from hospital feeling well.

Comment

It appears that at least in some cases of scurvy with anaemia there is an abnormally rapid rate of disappearance of transfused red cells.

The phenomenon of excessive rate of disappearance of donor cells may be due to either haemorrhage or haemolysis. In the six cases described above in which transfused red cells disappeared rapidly there was no haemorrhage to account for this. The gums were haemorrhagic, but the loss of blood from this source is negligible, as the tests for occult blood in the stools were almost invariably negative. In Case 4 there was considerable haemorrhage, but the disappearance of donor cells had been excessive prior

to this, and continued to be excessive even after haemorrhage ceased. The patients had intramuscular haematoma, but these did not seem to increase in size after transfusion. This is not a matter on which one can dogmatize, since the haematoma were not measured. The shortened survival time of red cells seemed to be due to haemolysis.

Pigment studies, such as the measurement of stool and urine urobilinogen excretion, were not made in these patients. Bronte Stewart (1950, 1953) studied a similar group of patients with scurvy and anaemia in this hospital who were not transfused. He found that their urobilinogen excretion was greatly increased above normal values. This was related in large degree to the presence of intramuscular haematoma. He was unable to interpret his findings as providing positive evidence of an intravascular haemolytic process, although the occurrence of such haemolysis could not be excluded with certainty.

The course of the anaemia of scurvy patients who are merely put to rest in bed, without any other therapy and while still receiving a vitamin-C-deficient or vitamin-C-free diet, is important in this discussion. Other workers have reported observations on this point. In a few cases there has been spontaneous remission of the anaemia (Ungley, 1938; McMillan and Inglis, 1944; Vilter *et al.*, 1946). In the majority the anaemia has remained stationary (Mettier *et al.*, 1930; Ralli and Sherry, 1941; McMillan and Inglis, 1944; Vilter *et al.*, 1946).

In occasional cases there has been a rapid increase in the degree of anaemia despite increased reticulocytosis (Mettier *et al.*, 1930; Jennings and Glazebrook, 1938; Vilter *et al.*, 1946; Bronte Stewart, 1950; Brown, 1951).

It is not clear why there is this variability of course of the anaemia on rest in bed alone. Pirani (1952) has shown that small but significant amounts of ascorbic acid are present in the adrenal glands and other tissues even in the most advanced states of scurvy. It is possible that rest in bed might promote remission of the anaemia by diminishing the general metabolic demand for vitamin C and thereby making the tissue vitamin-C reserves available for erythropoiesis. Whether or not this will occur might depend on the ratio of the amount of vitamin C available to the amount required.

Such a balance mechanism might account for the extremely rapid disappearance of donor red cells in so many cases in this investigation, because the large transfusion of blood increases the general metabolic demand for the inadequate amount of available tissue vitamin C.

The speed with which donor cells were eliminated and the rapid fall in the patients' haemoglobin appeared to be in excess of the fall in haemoglobin observed by other authors in patients who had not been transfused and who had been kept in bed on a vitamin-C-free diet.

Thus, whilst the results of this investigation support the view that there is a haemolytic factor causing diminished survival time of red cells transfused to scurvy patients, they do not necessarily indicate that a haemolytic process is the cause of the anaemia in untreated cases. Further investigation to elucidate this point is planned.

It is curious that the abnormally rapid rate of red-cell destruction appeared to persist in three cases for some days after vitamin-C therapy was begun. It is possible that the cells were "prepared for destruction" and could not be saved by the treatment. Alternatively, it is possible that the haemolytic mechanism persisted for some days owing to some tissues having a prior claim to the added vitamin C.

Summary and Conclusions

Eight cases of scurvy with anaemia and one without anaemia have been observed whilst at rest in bed on a vitamin-C-free diet. Transfused red-cell survival times were determined in each case and found to be abnormally short in six of the nine patients. In three of these six patients the increased rate of red-cell destruction

persisted for some days after the beginning of vitamin-C administration. In the remaining three of the nine patients the donor red-cell survival times appeared to be normal, but two of these cases could not be studied adequately, and even the one who was adequately followed showed a rapid fall in the number of transfused red cells one week after vitamin-C therapy was started. It is possible that the blood transfusion materially increased metabolic demands for vitamin C, and this factor may have contributed to the rapid destruction of donor cells. With this reservation, the results of this investigation support the view that a haemolytic process is an important factor in the pathogenesis of the anaemia of scurvy.

ADDENDUM.—Since this paper was prepared an additional nine Bantu male patients with scurvy and normoblastic bone marrow have been studied by the same methods. Three of these, who were severely anaemic, were transfused with sedimented red cells from 1 pint of blood. All three patients eliminated the transfused red cells very rapidly. In the remaining six patients 1 pint of blood was first removed; subsequently they were transfused with 1 pint of blood. Red-cell survival was greatly decreased in five of these patients, the sixth patient having a normal red-cell survival time. The sixth patient (and one of the five with diminished red-cell survival) was not anaemic. The other four were anaemic. It appears that the proviso inserted in the main body of the paper that overtransfusion might be playing some part in the abnormal red-cell survival in untreated scurvy is unnecessary. Red-cell survival was abnormal even when a replacement transfusion was substituted for simple transfusion. An increase in the protein content of the diet by the addition of thoroughly stewed meat also did not alter the diminished red-cell survival in the last four patients studied. In the combined series there were thus 14 anaemic patients and 2 non-anaemic patients who were maintained on the vitamin-C-free diet for more than seven days. Of the anaemic cases 13 had greatly diminished red-cell survival. Of the non-anaemic cases, red-cell survival was normal in one and diminished in the other.

My thanks are due to Professors F. Forman and J. F. Brock, in whose departments this work was carried out; to the C.S.I.R. Research Unit directed by Professor J. F. Brock for technical assistance; to numerous house-physicians for help; to the University of Capetown Staff Research Fund for a grant to cover expenses; and to Lederle Laboratories Division of the American Cyanamid Company, New York, for supplies of anti-M serum. This work was done with support from the Lady Tata Memorial Trust.

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The Association of Universities of the British Commonwealth has published a useful list of postgraduate fellowships, scholarships, grants, etc., for advanced study and research, tenable at universities in the United Kingdom, together with details of some of the more important awards tenable overseas by British graduates. The list is published by the Association at 5, Gordon Square, London, W.C.1. Academic interchange between the universities of Britain and those of other European countries has been sponsored by the British Council for several years. The Council has now published a pamphlet (*University Interchange between the United Kingdom and other European Countries, 1948-1953*) listing all such interchanges.

CEREBELLAR NECROSIS IN A CASE OF SUBARACHNOID HAEMORRHAGE

BY

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The possible dangers from lumbar puncture to patients with increased intracranial tension are well known. The main one is forcible impaction—"coning"—of the brain-stem and cerebellum into the foramen magnum, following excessive and rapid drainage of cerebrospinal fluid from the lumbar theca. This may or may not be accompanied by uncus herniation through the tentorium cerebelli. These risks are mentioned only briefly in the standard neurological textbooks, but their mechanisms have received some close attention in the literature (Jefferson, 1938; Cairns, 1939).

A less frequently cited complication is the precipitation of cerebral haemorrhage, and Schube and Raskin (1936) mention 14 examples occurring in the literature. Two of these were cases of cerebral aneurysm. Androp (1939) reports a case in which death occurred, following lumbar puncture, from haemorrhage into the spinal cord and brain-stem.

Necrosis of the cerebellar tonsils was present in the following case of subarachnoid haemorrhage due to rupture of a cerebral aneurysm. Lumbar puncture was performed three times in the course of the illness. This necrotic lesion is considered to have resulted from an extreme and possibly prolonged degree of coning of the cerebellum. So far as I am aware, such a lesion has not been described before.

Case History

A 41-year-old housewife was admitted in an unconscious state to a country hospital in Northern Ireland on November 14, 1951. She had complained of headache since November 9, and had collapsed on the 13th. On examination there was pronounced neck stiffness, and a subhyaloid haemorrhage was present below the right optic disk. At lumbar puncture the fluid was blood-stained and under obviously greatly increased pressure. The supernatant fluid was xanthochromic.

The patient's condition improved somewhat until November 17; she was more conscious, but now complained of diplopia, although an external ocular paresis could not be demonstrated. On the 19th lumbar puncture was repeated, and yellow fluid not under increased pressure was obtained. Following this, she complained of headache, and became drowsy. A right lower facial weakness was noticed at this time.

Again there was some improvement, and on November 24 lumbar puncture was performed for the third time. A few drops of clear fluid, not under pressure, were obtained. In a matter of minutes she became shocked and lapsed into semicomatose.

The patient was transferred to the neurosurgical unit at the Royal Victoria Hospital, Belfast, where she arrived at midnight of the same day. She was deeply comatose on admission, with marked neck stiffness, extensor plantar reflexes, and B.P. 150/80 mm. Hg. The pupils were unequal, and fixed in dilatation. Papilloedema was not thought to be present. X-ray examination of the skull failed to reveal any fracture, and the pineal gland was not visible.

Operation was undertaken immediately. In view of the previous right-sided signs, a left temporal burr-hole was made under local analgesia. The dura was found to be

tense, but needling did not produce any fluid, bloody or otherwise. Three burr-holes were then made on the right side, and dark blood clot and old blood were evacuated from both the subdural and the subarachnoid spaces on that side. A pronounced but only transient improvement took place in the patient's condition, and death occurred at 5 p.m. on November 25.

Post-mortem Findings.—Necropsy was performed 17½ hours after death. On opening the skull an extensive subarachnoid haemorrhage became apparent, and it was found to be present chiefly over the base of the brain, more particularly on the right side. Its source was a ruptured aneurysm 1 cm. in diameter on a branch of the right middle cerebral artery, fairly high in the Sylvian fissure. The brain was generally swollen, the right temporal lobe more than the left. On sectioning the brain the subarachnoid haemorrhage was seen to extend for about 3 cm. into the substance of the right temporal lobe from the region of the aneurysm. No other intracerebral haemorrhages were revealed. Gross hernias of the uncus and cerebellum were observed, the latter very marked indeed, so that it was only with difficulty that the cerebellar tonsils and the brain-stem could be delivered from the foramen magnum. The lower 1.5 cm. of the tonsils was swollen, discoloured, and haemorrhagic. Histological sections from these affected areas showed recent haemorrhagic necrosis, in which there was an acute inflammatory cell reaction, together with fibrinoid necrosis of the walls of several small vessels.

Discussion

The clinical diagnosis of subarachnoid haemorrhage, including episodes of unconsciousness, could be satisfactorily, if superficially, confirmed at necropsy on the basis of the findings described above. It is in trying to reconstruct the precise chronological details of these changes that problems arise.

It is probable that a potentially reversible degree of uncomplicated cerebellar coning developed early in the clinical course. However, the age of the necrotic process in the tonsils was only about 24-48 hours. This particular lesion, if precipitated by lumbar puncture, was more likely to be related to the last occasion than to the first two. The intracerebral haemorrhage, too, was of recent occurrence, but its histological details do not permit of such an accurate estimate of its age. It may have been precipitated also by the third lumbar puncture, but equally well may have arisen earlier, either spontaneously or in relation to the previous lumbar punctures. Irrespective of when and how this latter haemorrhagic lesion took place, it seems indisputable that it materially aggravated the degree of cerebellar coning already present. Schaller (1933) and Masserman (1934) pointed out that foraminal herniation is due not so much to a direct "plugging" effect following the withdrawal of cerebrospinal fluid as to oedema of the brain which develops subsequently. An intracerebral haemorrhage could be visualized easily as contributing to this. Clearly, in the present case, at least three distinct factors—subarachnoid haemorrhage, cerebral haemorrhage, and lumbar puncture—interacted in a complex manner to produce the pathological end-result described.

These speculations, academic and inconclusive though they may be, do not invalidate the general warning of the dangers of injudicious lumbar puncture in cases of subarachnoid haemorrhage. It is impossible to escape the conclusion that lumbar puncture in this case contributed at least to the cerebellar coning and necrosis, and possibly further subarachnoid bleeding. It would seem that, once the diagnosis is established by the withdrawal of evenly blood-stained fluid which leaves a xanthochromic supernatant fluid after centrifuging, there are no further indications for lumbar puncture in cases of subarachnoid haemorrhage.

Summary

A case of subarachnoid haemorrhage due to rupture of a cerebral aneurysm is described. Death occurred

after the third lumbar puncture. At necropsy, cerebral haemorrhage, cerebellar coning, and tonsillar necrosis were found. No reports of the last-named lesion can be found.

I am grateful to Professor J. H. Biggart and Dr. J. E. Morison for assistance and criticism. Mr. C. A. Calvert, F.R.C.S., kindly gave me permission to publish this case.

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ACUTE DERMATOMYOSITIS

BY

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Recent articles (Oppel *et al.*, 1950; Thorn *et al.*, 1950; Suzzman and Rudolph, 1951) have shown the value of cortisone and A.C.T.H. in acute dermatomyositis. A further case of this rare disease responding dramatically to cortisone therapy is described.

Case History

A domestic servant aged 24 was admitted to the Central Middlesex Hospital on May 14, 1952. She had been in good health till three months previously, when her fingers became stiff and swollen at times. A week before admission her left hand felt weak, and the following night a sensation of tightness developed in her throat. She could not swallow properly. When she awoke the following morning (May 10), both hands felt weak. They were not painful. The weakness and stiffness of the finger- and wrist-joints soon involved the elbows and shoulders, and later both her knees and hips-joints and her back. Her legs felt useless and her muscles became increasingly painful and tender to pressure. On the same day a bright red rash started on the dorsal surface of her hands, soon spreading up both arms, and a similar rash involved both legs. On May 12 her eyelids felt swollen and stiff and they were red-rimmed. This condition lasted only a few hours. Throughout this time she felt ill and had lost her appetite completely. She vomited on three occasions. Each movement was an effort, and she ached all over when she attempted to shift herself in bed.

Physical examination showed her to be well nourished but very ill. Her temperature was 104.6° F. (40.3° C.). Her tongue was heavily furred, and her skin was hot and clammy. There was a diffuse confluent erythematous rash on the dorsal aspects of both feet and on the upper arms. In other areas irregular red macules were present. The rash was mainly confined to the limbs, but had a few extensions on the skin of the abdomen and back. She was profoundly weak, being unable to sit up, and only with difficulty could she straighten her arms or bend her knees. All her muscles were tender on palpation and felt firm and full. The superficial reflexes were normal.

On May 15 her temperature was 103° F. (39.4° C.). The rash appeared to be clearing from the forearms and from the dorsal surfaces of her feet. However, she seemed weaker and to have become worse. She was totally unable to move herself and could swallow fluids only, as she had marked dysphagia. She had a troublesome watery diarrhoea and retention of urine developed, which required catheterization. Her general condition was deteriorating so rapidly that it was decided to give cortisone immediately, and 100 mg. was injected intramuscularly at 5.30 p.m. An hour later she could move herself in bed more freely and could bend her

knees. Next morning there was definite improvement. The temperature had fallen to 101.8° F. (38.8° C.). She could raise her arms above her head, sit up without help, and swallow without difficulty. Her muscles felt flabby and hypotonic. The knee-jerks had returned. The rash was fainter. Cortisone, 100 mg. twice daily, was given.

Improvement continued, and within four days the temperature had fallen to 98.6° F. (37° C.), the rash had almost completely faded, and her general condition had improved so greatly that cortisone was discontinued. The following day she had a partial relapse. The muscles became more tender and tense and she had two rigors, the temperature reaching 102° F. (38.9° C.). Cortisone, 25 mg. six-hourly, was recommenced.

On May 21 the rash reappeared on the back of both hands and the front of both arms. It was bright red and confluent. Her limb movements, however, were now quite free and her muscles were not tender. The rash became more extensive for the next two days. On the elbows and knees it was confluent, the flexures were pinky red and the eyes were red-rimmed. It then began to fade once more, and was last seen on May 6, when only small erythematous areas on the left forearm were noted.

On June 3 cortisone was discontinued. A.C.T.H. gel, 40 I.U. twice daily intramuscularly, was begun. For two days after the change there was a recurrence of slight muscle stiffness, and on June 5 the temperature rose to 102.4° F. (39.1° C.). However, the patient became rapidly stabilized on the dosage, and on June 10 she was allowed up.

On June 17 the A.C.T.H. dosage was reduced to 40 mg. once daily, and ten days later it was discontinued altogether, the patient having then had 1,500 mg. of A.C.T.H. and 2,200 mg. of cortisone in 43 days. Her history was now one of gradual but continued improvement. Muscle power increased steadily. At first inclined to shuffle along and to tire easily on walking, she walked normally on discharge. She could write distinctly and effortlessly. On July 8 she was discharged. There were then no abnormalities on physical examination.

The patient returned to her home in Ireland two days after discharge from hospital and has written to me on several occasions since. She has remained well, but complained of some weakness and stiffness of her wrist and finger-joints about six months after her return. As this continued she was admitted in April, 1953, at my request, to St. Laurence's Hospital, Dublin, under care of Dr. H. J. Counihan, who wrote to me that the changes present were like those of rheumatoid arthritis and that, apart from these changes in her fingers, her general condition was satisfactory. She was discharged from hospital again in May, 1953, and has been receiving injections of cortisone. According to the patient, her fingers and wrists have become fully mobile again—so much so that she is returning to London to recommence work shortly.

Most of the significant investigations are summarized in Table I.

TABLE I.—Blood and Urine Investigations in Case of Dermatomyositis

Date	Hb %	Leucocyte Count	Seg. Polys. (%)	Staff Cells (%)	Juvenile Polys (%)	Myelocytes %	Eosinophils %	Lymphs %	Monos %	Creatine Excretion (mg. 24 hrs.)	E.S.R. (mm. 1 hr.)	Westergren
14/5/52		9,600	90	1	—	—	4	5	—	—	—	33
15/5/52		Cortisone begun										
16/5/52												
18/5/52												
21/5/52	69	59,800	55	34.5	2.5	3.5	—	4	0.5	710	—	23
27/5/52										376		11
30/5/52		13,000	82	5	—	—	—	13	—	40		21
3/6/52												11
10/6/52												
11/6/52										7.3		7
24/6/52												
27/6/52		Hormones (A.C.T.H.) discontinued										
8/7/52	90	5,300	71	2	2	—	—	22	3	—	—	4

A muscle biopsy was carried out, and Dr. Walter Pagel reported as follows: "Fragments examined are fat tissue with some haemorrhages and peripheral muscle, with some occasional hyalinization, but without any regenerative or inflammatory cellular changes. The nuclei are well stained throughout." It is possible, however, to obtain an indefinite or negative biopsy report on material obtained from one muscle while material from another shows typical changes (W. Pagel, 1952, personal communication). Suzzman and Rudolph's case also lacked a positive biopsy report, but was in every way a typical acute example of the disease.

Not much emphasis has been laid on the quite frequent occurrence of a polymorphonuclear leucocytosis in acute dermatomyositis, but cases besides the present one showing this feature have been described (Table II).

TABLE II.—High Leucocyte Counts Found During Course of Acute Dermatomyositis

	White-cell Count	Polymorphonuclears	Primitive Polymorphs
Keil (1940)	70,000	With polymorphonuclear leucocytosis	
Holmes (1948)	63,600	89%	34%
Oppel et al. (1950)	64,600	60%	
Suzzman and Rudolph (1951)	31,000	81%	5%
Clein (1953)	59,800	55%	40-5%

Summary

A case of acute dermatomyositis in a young woman is described, the diagnosis being made on the classical clinical picture presented, despite the absence of definite histological proof. Prompt remission following the use of cortisone was noted, with partial relapse when it was discontinued too soon.

Emphasis is laid on a high polymorphonuclear leucocyte count during the course of the disease.

Treatment with A.C.T.H. or cortisone is believed to be the method of choice in acute cases.

I should like to thank Dr. R. A. J. Asher for his encouragement and permission to report this case, which was treated under his care; Dr. W. Pagel for carrying out the pathological examination and for advice; Dr. D. A. Brewerton for many helpful suggestions; and Dr. H. J. Counihan for reinvestigating the patient and forwarding his helpful report to me.

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The Wellcome Film Unit has produced two new 16 mm films entitled "The Dissection of a Mosquito for Malaria Parasites" and "Pinning Mosquitoes," both in colour with sound. The first is a demonstration by Mr. P. G. Shute of the Medical Research Council's Malaria Reference Laboratory. After showing the phases of the life cycle of the malaria parasite within the mosquito, the film demonstrates how the salivary glands of the insect are pressed out and prepared for examination so that the sporozoites can be identified. The removal of the stomach and the detection of oocysts are then demonstrated. (Running time, ten minutes.) The second film shows how mosquitoes should be pinned, how to stage and label the pinned insects for permanent display and how to pack them for dispatch through the post. It was produced in collaboration with the Department of Entomology at the London School of Hygiene and Tropical Medicine. (Running time, five and a half minutes.)

Medical Memorandum

Familial Incidence of Sialectasis

Cases of recurrent swelling of a salivary gland associated with characteristic x-ray appearances, and due to causes other than calculus, are seen from time to time. Such cases are described in detail in the literature, but there is sparse reference to any familial tendency, so that the occurrence of the condition in three generations of a family, all treated at Southend General Hospital, is of some interest.

REPORT OF CASES

Case 1.—In 1938 Mrs. X, then aged 50, was seen with a left-sided facial swelling which had been present on and off for 24 years. Until recently she had been able to make the swelling disappear by digital pressure, and stated that the disappearance coincided with the escape of fluid into her mouth. However, in the month prior to admission she had not been able to do this.



Sialogram of Case 1, showing a severe degree of sialectasis with gross dilatation of ducts.

Examination revealed a swelling in the region of the left parotid gland. It was lobulated and variable in consistency, the upper portion being firm, the lower portion fluctuant. (From a drawing in the case notes, the swelling appears to have been about the size of the patient's ear.) Radiotherapy brought about complete resolution of the swelling, and there has been

no further recurrence in the succeeding 15 years. A recent sialogram, however, showed a dilatation of the main duct and some of the smaller ducts, as well as terminal cystic dilatations (see illustration).

Case 2.—In 1942 Miss X, then aged 26, a daughter of Mrs. X, was seen with a swelling of the right side of the face, present on this occasion for three weeks. She gave a history of having had swellings of both sides of the face at different times since childhood, and had had treatment elsewhere. The parotid gland on the right side was found to be irregular, and was considered to be cystic. There was a discharge of flocculated material from Stensen's duct on that side, and a swab of this material subsequently grew a non-haemolytic streptococcus. A probe was passed up the duct, and no stone felt. The left parotid was slightly lumpy. A course of deep x-ray therapy was given with very good effect, and there was no recurrence for six years. An ear infection at that time, associated with some lymphadenitis, caused a temporary flare-up. The patient reappeared in April, 1952, with a recurrence of symptoms—intermittent swelling of one or other parotid gland, which at times was painful. A sialogram done at this time showed dilatation of all the ducts, but to a less degree than her mother's.

Case 3.—A son aged 7 of Miss X, who had married and had three children, was seen in October, 1951, with a history of swellings on both sides of the face, starting several months previously. That on the left side had subsided completely, but on the right side only partially, and tended to recur from time to time. The swelling would sometimes occur during a meal, accompanied by pain, and would subside after an hour or two. A sialogram showed the "snow-storm" appearance characteristic of an early stage of sialectasis, where the finest terminal ductules only are involved.

DISCUSSION

The underlying pathology in this condition, known variously as sialectasis, sialangiectasis, or chronic recurrent parotitis, is obscure, but the essential feature is obstruction of the parotid ducts. Diagnosis is dependent in the final instance on sialography, and the reader is referred to the writings of Payne (1931, 1933) and to the well-illustrated article by Rose (1950) for the technique and description of the sialographic types.

Pearson (1935), discussing the possible mechanism of the swelling, considers that obstruction of the ducts plays a prominent part, either by spasm, oedema, mucus plugs, or epithelial debris, or by the presence of an abnormally viscid saliva. He quotes Steinitz (1929) as a believer in the abnormally viscid saliva theory, and indeed most authors are agreed that the character of the saliva differs from the normal in these cases. Normal parotid secretion is watery, with very little mucus, but the saliva in this condition becomes more mucoid in type and may contain flakes and casts, plugs of mucus and cells, and has been compared with frog's spawn.

Meyer (1934) believed the condition to be due to an acid saliva, and found some improvement with alkali treatment. He also thought that allergy might play a part, and described a case of a boy aged 6 years with parotid swellings associated with the passage of rosy saliva, in whom he obtained positive skin reactions to certain foodstuffs. With the removal of these foodstuffs from the diet the swellings subsided. Sialography in this case showed dilatation of the minor ducts; and it is of interest to note that the boy's mother and his grandmother had a similar condition. No other examples suggesting a familial tendency can be traced in the literature, although two of Pearson's cases were brother and sister. These appeared in a whole series which he described, and, beyond mentioning that they were brother and sister, he made no further comment.

Monro (1951) is another who regards allergy as a main aetiological factor. His case showed a high eosinophil count in the blood and also in the parotid secretion, while the actual blockage of the orifices of Stensen's ducts was brought about by plugs of viscid purulent saliva, observed to be rich in eosinophil leucocytes.

It would seem reasonable to correlate the possible allergic nature of the condition, with its occurrence in different generations of a family as reported here and as described by Meyer, on the grounds of an inherited allergic diathesis, though the occurrence of primary congenital structural changes in cases of sialectasis has not been disproved.

I am grateful to Mr. Rodney Maingot, Mr. Donald Barlow, and Mr. Andrew Monro for permission to publish the above cases, and to Mr. Robert Monro for much constructive criticism in preparing this report.

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The Southend-on-Sea Hospital Management Committee has recently accepted a Trust from Mr. Sydney F. Body, for many years associated with hospitals in the town, expressed in favour of the medical staff of the group of hospitals. The Trust, *inter alia*, provides: (a) For an annual lecture to be known as the Sydney Body Lecture to be given by an eminent speaker; (b) the award of a medal, not necessarily annually, for merit or research in any approved medical subject in its widest sense. The first Sydney Body medal is to be awarded to Dr. William Evans for his meritorious work in cardiology. Dr. Evans was, until 1946, a consulting physician at the General Hospital, Southend.

Reviews

TEXTBOOK OF OBSTETRICS

A Textbook of Obstetrics. By Professor Bruce T. Mayes, M.V.O., M.B., B.S., F.R.C.S.Ed., F.R.A.C.S., F.R.C.O.G. (Pp. 1,040; 19 coloured plates, 537 illustrations. Price 100s.) Sydney: Australasian Publishing Co. London: George G. Harrap. 1953.

This is a beautiful book which, once the reader has got used to its price, gives pleasure merely to flick over the pages, to glance here and there at the excellent and numerous drawings and photographs, to pause and read a careful description of a nursing brassière or of some day-to-day procedure such as rectal examination, or to become absorbed in the author's asides of personal experience and observation. Even the areas on the abdomen over which the foetal heart is to be heard with greatest intensity are indicated by dots which are heart shaped. How many authors or teachers point out which particular parts of the hands and arms are likely to escape attention during routine scrubbing up, and which become contaminated during drying with a towel? Similar examples of care and devotion to detail, and of art for art's sake, shown by this outstanding teacher could be quoted from almost every page.

The book not only reflects the ability and character of the author, but also the Australian practice of obstetrics, which Professor Mayes does much to encourage by making special reference to any original work carried out in that country. It provides rather more than students in Britain would be expected to know, but its size is accounted for by its wealth of illustrations and spacious type-setting, rather than by digressions into the realms of the specialist.

The author errs on the side of conservatism and hesitates to abandon completely some of the older methods of treatment, such as vaginal packing for placenta praevia and the tape-and-catheter method for replacing prolapsed cord. It is surprising too not to find any reference to the use of penicillin in the treatment of syphilis, to the giving of ergometrine before the delivery of the placenta, even for third-stage bleeding, or to gas-and-air analgesia. But what do these or similar points matter? There is usually more than one way of doing a thing well, and any omission and faults are more than counterbalanced by a host of highly commendable features. Those who learn and practise under the rather different conditions which obtain in Britain, and who have many cheaper textbooks from which to choose, may regard this one as having a spiritual rather than utilitarian appeal. None, however, could deny that it has appeal. It is fascinating: there is even an account of a case of retained placenta successfully treated by injecting the cord with coconut milk obtained from a near-by palm.

T. N. A. JEFFCOATE.

PULMONARY TUBERCULOSIS

Pulmonary Tuberculosis: Pathology, Diagnosis, Management, and Prevention. By Walter Pagel, M.D., F. A. H. Simmonds, M.D., D.P.H., and Norman Macdonald, M.B., M.R.C.P.Ed. Third edition. (Pp. 728; illustrated. £4 4s.) London: Geoffrey Cumberlege (Oxford University Press). 1953.

The third edition of this well-known monograph on pulmonary tuberculosis will be welcomed by everyone interested in the subject. The book is divided into five parts—pathology, diagnosis, prognosis, management, and lastly epidemiology and prevention. The clinician may find the introductory section on pathology tedious and top-heavy, occupying, as it does, more than a quarter of the text. In it the consideration of bronchogenic tuberculosis has been extensively revised, and special attention is directed to the significance of the primary cavity in the young adult.

Physical signs in pulmonary tuberculosis receive scant notice. Indeed, the art of physical examination of the chest,

which takes so long to acquire, is now rapidly dying out as more and more attention is given to the x-ray findings. I was glad to read in the treatment of haemoptysis that the authors "are not impressed with the argument which favours the withholding of morphine during the bleeding phase, on account of the supposed danger arising out of depression of the cough reflex." Having witnessed the disastrous result which may follow the more modern method of sitting the patient up so that he may cough up the blood, I am inclined to agree. The surgical text has been largely rewritten, although there is now no surgeon included in the team of authors. In some ways I feel this is regrettable, for the surgeon should be able to give a better account of his operations, his reasons for selection of cases, and the factors which may lead to failure, than can the physician.

I have frequently tested the previous edition by using it as a book of reference in clinical work, and have seldom failed to find the information required. The book contains over 300 figures and illustrations, which are extremely well reproduced. I have no hesitation in recommending this edition to the profession. It is an admirable work, a credit both to the authors and to the publishers.

G. E. BEAUMONT.

GENERAL PHYSIOLOGY

General Physiology. By Bradley T. Scheer. (Pp. 613; 110 figures. £2 16s.) New York: John Wiley and Sons, Inc. London: Chapman and Hall. 1953.

Professor Scheer has endeavoured to write a book for the "prospective specialist in biology, including medicine." He has borne in mind the limited time available in the curriculum and has attempted the broadest treatment possible in the circumstances. In so doing he has excluded old or outmoded theories with little relation to present-day concepts. The assumption is made that the work of the student is based on practical experimental work and that he is going to collaborate with Professor Scheer in his experimental rather than a merely textbook approach to physiology.

The book is in five parts—physico-chemical foundations, chemical dynamics, energy transformations, development of organisms, and the integration of the organism. The author sets out well and clearly the basic physical chemistry and the electron theory of atomic structure. Throughout the book he interprets phenomena in terms of atomic structure and valency changes. Avoiding the human, or rather treating the human being as a biological type, the author ranges widely over all the manifestations of life. The book is clear, well written, and can be recommended to anyone anxious to interpret and understand biological phenomena in terms of modern scientific concepts.

A. ST.G. HUGGETT.

SYMPOSIUM ON EVOLUTION

Symposia of the Society for Experimental Biology. Number VII: Evolution. (Pp. 448. £2 5s.) London: Cambridge University Press. 1953.

In this symposium there are twenty-three contributions to the general subject of evolution from many different points of view. The organisms discussed range from bacteria to man and from ferns to butterflies, and the light which their studies throw on evolution serves to emphasize the fundamental unity of the organic world.

There is a masterly introduction by J. B. S. Haldane. He first of all defends mathematical genetics against the criticism of Waddington that "very few qualitatively new ideas have emerged from it." He points out that many ideas "have emerged so completely that their origin is forgotten." Others, such as the findings by Penrose and Haldane that some genes which are deleterious to human beings are kept in being only by mutation, have not yet penetrated far, since the view is still widely held that the human race could be permanently freed from such genes by negative eugenics.

Pringle opens with a discussion of the origin of life; Haldane stresses the fact that recent work on bacteria and viruses indicates that a simple organism "can incorporate and reproduce indefinitely constituents of another by processes which cannot be called sexual." It is possible that two or more kinds of life began independently and then in some way came together. Medawar discusses the remarkable diversity of the antigens found in different members of one mammalian species and the ways in which the dangerous effects on pregnancy have been partly overcome. He makes the important generalization that "endocrine evolution is not an evolution of the hormones but an evolution of the uses to which they are put."

Hinshelwood makes a valuable survey of his recent work on bacterial adaptation, and Demerec contributes a paper on the reaction of genes of *Escherichia coli* to certain mutagenic agents, such as manganous chloride and ultra-violet rays. Other notable papers are on the genetical structure of populations (Mather), stochastic processes and the growth of bacterial colonies (Kendall), and epigenetics and evolution (Waddington).

The juxtaposition of factual information from so many points of view in a rapidly growing field renders the volume invaluable to the general biologist interested in evolutionary mechanisms. The British Council and the Rockefeller Foundation are to be thanked for financial aid towards the cost of publication.

S. C. HARLAND.

BIOASSAY OF HORMONES

Ciba Foundation Colloquia on Endocrinology. Volume V: Bioassay of Anterior Pituitary and Adrenocortical Hormones. Edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., Ch.B., assisted by Margaret P. Cameron, M.A., A.B.L.S. (Pp. 228; 53 illustrations. 25s.) London: J. and A. Churchill. 1953.

This is one of twelve informal colloquia that have been arranged by the Ciba Foundation and subsequently published under the editorship of Dr. G. E. W. Wolstenholme, with the assistance of Miss Margaret Cameron; recordings of the discussions were made by Miss N. Bland. The usual high standard to be expected from Ciba Foundation publications is here conspicuous throughout, and this has been found to be by no means incompatible with the "house party" atmosphere which the preface says has been attempted at all such conferences. The contributors come from widely separated groups, but they are studying common problems of assay of the pituitary and adrenal hormones. The results are of interest to all research workers and to research-minded clinicians.

There is an initial discussion on the requirements for clinically useful endocrine bioassays by Albert Segaloff, of New Orleans. The section on thyrotrophic hormone considers bioassay in the hypophysectomized rat using P^{32} ; assay by iodine¹³¹ (by Gilliland and Russell Fraser of the British Postgraduate Medical School); and chick assays using P^{32} by A. C. Crooke and Joyce Matthews, of Birmingham University. The section on gonadotrophins is illuminated by an excellent record of original work by W. R. Butt and A. C. Crooke on chromatography of urinary gonadotrophins. The clinician will be interested to find a chapter on their clinical use and clinical applications. E. B. Astwood, of Boston, discusses biological tests for luteotrophin as a basis for assay. Discussions on prolactin, including conventional methods of assay, and the assay of urinary prolactin are included in this section.

In section four, on the bioassay of growth hormone, C. H. Li considers the well-established procedures such as weight in normal plateaued rats, hypophysectomized rats, and dwarf mice, increase in tail length of hypophysectomized rats, and increase in width of epiphyseal cartilage of the tibia of such rats. Also discussed is the use of radioactive tracers to investigate increase in liver weight, change in nitrogen constituents of the blood, change in serum phosphorus and phos-

phatase, change in nitrogen and phosphorus balance, and increase in protein synthesis. E. Reid, of Cambridge, considers the assay of growth hormone for diabetogenic activity, a field in which the Cambridge Biochemical School have been pioneers.

Perhaps the most interesting sections are five and six, on adrenocorticotrophic hormone and adrenocortical hormones. In particular I should like to mention the important contribution by C. H. Gray and D. M. V. Parrott on the measurement of A.C.T.H. activity in plasma by the depletion of ascorbic acid in the adrenal cortex of the hypophysectomized rat. Ingle reviews the recent work done in his laboratory on the effect of adrenalectomy and adrenal steroids on muscle work. Marthe Vogt discusses observations on comparative biological assays of adrenal cortical steroids. J. A. Nissim, of Guy's, considers the assay of glucocorticoids, with liver glycogen estimations in mice and rats. Bush writes a most important section on paper chromatography of steroids, in which he has played such a leading part, and the application of this method to assay problems. J. H. Gaddum, of Edinburgh, brings his wisdom to some invaluable closing remarks.

S. L. SIMPSON.

DERMATOLOGY IN GENERAL PRACTICE

Dermatology in General Practice. By Jacob Hyams Swartz, M.D. Foreword by Professor C. Guy Lane, M.D. (Pp. 581; 253 figures. £4 4s.) London: Baillière, Tindall and Cox. 1953.

It is not possible in the compass of five or six hundred pages to give anything like a complete account of all the diseases of the skin, and the problem of pruning is one to which an author of a textbook for non-dermatologists must find his own solution. Dr. Swartz, in this book, has aimed at making some mention, however brief, of all the dermatoses; he has left very few disorders unnamed, though his descriptions of some of the rare ones are perforce often little more than can be found in a medical dictionary.

After a very short introductory section on the anatomy and physiology of the skin and a longer section on the care of the skin, the main part of the book consists in the description of individual disease pictures classified according to regions. This part of the book follows the orthodox lines which have been familiar in textbooks for several decades, and there is little that is new on diagnosis and aetiology. It is perhaps desirable to be dogmatic in a work of this kind, but many of Dr. Swartz's statements are so highly controversial that the dermatologist can hardly leave them unchallenged. For example, acne varioliformis "is probably a tuberculide" requiring, one may observe, the treatment of "hygiene, large dosages of vitamin A, and a high protein diet" (p. 97).

The author's account of treatment is, on the whole, well done and it records plentifully his personal preferences, but there is no mention of isonicotinic acid hydrazide for tuberculosis, nor of mepacrine for lupus erythematosus. This is not because the book is out of date, for cortisone, A.C.T.H., and the antibiotics are given very adequate consideration. The book includes a long section on mycotic infections, of which the author has made a special study, and a chapter on syphilis. Treatment by irradiation is briefly mentioned, the antibiotics are reviewed, and A.C.T.H. briefly considered. Finally, there is a practical formulary of over 30 local applications written in a confusing combination of English and doubtful Latin. It is noticeable that the author has but little use for the modern emulsifying bases.

Notwithstanding these criticisms, this should be a useful book. It includes a good deal of information not usually presented to the general practitioner, it is clearly written and profusely illustrated with photographs which are on the whole good. It is doubtful, however, whether there is anything about this book which presents a serious challenge to others of its kind already well known in Britain.

F. RAY BETTLEY.

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MOUSE CARCINOGEN IN TOBACCO TAR

The experimental production of skin carcinoma in mice by painting them with cigarette tar has been performed in the U.S.A. by Drs. E. L. Wynder, E. A. Graham, and A. B. Croninger. The results are to be published soon.¹ Some indication of the size of the lung cancer problem in England and Wales now may be seen briefly by comparing some death rates. In 1900 the crude annual death rate attributed to lung cancer was 8 per million persons. Fifty years later it had increased to 278 per million. In 1950 the disease caused 12,241 deaths, a total which comprised 24% of all cancer deaths in men at all ages and 40% in men of ages 45-54. The increase, which has continued since and seems likely to do so in the future, is only in very small part due to the increasing proportion of the population who live to the ages of higher cancer susceptibility. If part is due to better diagnosis, not the whole increase is spurious, and in Doll's moderate opinion² the real increase may well be more than half. As Doll points out further, the importance of this conclusion is that it holds out hope for prevention, for an increase of such extent and rapidity is almost certainly due to a potent environmental factor. The earlier conclusions of Doll and Hill in Britain,³ and of Wynder and Graham in the United States,⁴ did not at first obtain universal endorsement, partly because of a proper scientific caution, and partly for human reasons of a different kind, but the intervening three years have seen a growing acceptance, first, that the reported increase in incidence is real, and secondly that its major cause is smoking. Doll was the first to acknowledge that no proof is ever absolute, and that only by further experiment can confidence be increased until finally the truth is unquestioned.

The study by Wynder and his colleagues of the production of carcinoma with cigarette tar is an important contribution. They conclude from a survey of the literature that all previous attempts to induce cancer in mice with tobacco products were successful in the production of only seven epidermoid cancers

of the skin—a poor result, perhaps due in part to inadequate methods and too short a period of observation. In their own investigation a tar condensate, obtained by smoking a popular brand of cigarette in an apparatus designed to simulate human smoking methods, was applied in relatively large quantities, and over a long period, to the skin of mice (of the CAF₁ line). Of 81 mice so treated, 36 developed epidermoid cancer of the skin after a mean time of 71 weeks. This is a long latent period amounting to about half the life span of the animals used, and the rather moderate activity of the tar is shown by a parallel experiment in which 25 mice treated in the same manner with a solution of methylcholanthrene all developed carcinomata within 18 weeks. No tumours were observed in a control series treated with the solvent (acetone) alone.

What is the significance to be attached to these experiments? The fact that carcinogenicity had not hitherto been very clearly demonstrated as a property of cigarette tar did not invalidate the evidence already existing to incriminate tobacco. Equally, on the other hand, it cannot be claimed that the new results—suggestive as they are—afford any formal proof that the agent in cigarette tar which is capable of inducing cancer in the skin of mice is necessarily responsible for the increased incidence of bronchogenic cancer in man. Their true significance would seem to be rather that they represent an effort, made in accordance with the general acceptance of the nature of the risk and its almost certain cause, to identify the latter with precision. If the actual carcinogenic or possibly co-carcinogenic agents in tobacco remain to be identified it may be noted that no spectroscopical evidence of the presence of 3:4-benzpyrene was found by Wynder's associates, in agreement with a similar observation by Waller.⁵ Subject to the provisions made above, the new results might also be thought to increase the unlikelyhood that arsenic is the carcinogenic agent, since this is incapable of inducing cancer on application to the skin of animals.

The present developments must not be allowed to obscure the wisdom of Doll's view, that it may be unnecessary to await the isolation and identification of a specific carcinogenic agent before doing something to halt the rapid increase in mortality and to turn it into an even more dramatic decline. Few now doubt that abolition of the cigarette, or abstinence from its use, would be the most beneficent single step in cancer prevention available to us to-day. Short of this ideal, research will assuredly continue, and indeed should be promoted with much increased vigour, to identify the cause and allow prevention by its removal. Finally, the question arises whether the

combined weight of evidence is now so compelling as to convince the tobacco industry itself that there may be some connexion between tobacco and cancer of the lung.

RADIOLOGY AND LUMBAR DISKS

It is now about twenty years since it became recognized¹ that sciatica is nearly always caused by a protrusion of either the fourth or fifth lumbar intervertebral disk pressing on the fifth lumbar or first sacral nerve root. Though this observation may seem simple to-day, an enormous "disk" literature has grown up. This alone suggests that all the problems are not yet solved, and indeed opinions still differ widely on diagnosis, treatment, and prognosis.

While it is generally conceded that radiology is important in diagnosis, many authorities disagree sharply on how important, and particularly do they disagree about contrast radiography. The necessity for taking plain radiographs of the lumbo-sacral spine is universally agreed. But it must be emphasized that this investigation is chiefly of use in narrowing down the differential diagnosis, and in particular excluding a more serious lesion such as a metastasis or tuberculous infection. Even so, such gross pathological lesions as these, though usually easily recognized at operation or necropsy, may not appear on the best radiographs—including tomographs.² Radiology is a rather insensitive test, and often bony destruction is considerable before it is visible. Serial radiography is therefore necessary in a case of sciatica that does not respond to conservative therapy.

While plain radiographs convey limited yet indispensable information, too much must not be read into them. Some doctors who see scores of disk lesions every year become very astute in their clinical diagnosis and probably achieve an accuracy of over 90%. Having made a confident and usually correct clinical diagnosis, they are tempted to demonstrate the site of the offending disk on the radiograph. The only occasion on which a protruded disk can be seen on a radiograph is when it is calcified. Unfortunately this type of degeneration is almost unknown in low lumbar disks, though curiously common in the relatively very rare protruded thoracic disks.³

There are certainly some radiological signs suggestive of disk protrusion, but they may be dangerous if they lull the physician or surgeon into even greater

confidence in his already firm clinical diagnosis. Here two points are relevant. The first is that the volume of a lumbar disk is 10 ml. or more. If less than one-tenth of it protrudes, it is sufficient to press hard on a nerve root and cause intense sciatica. Such a small diminution in total disk volume will be quite undetectable on a radiograph. The second point is that disks desiccate. This is common in old age. When desiccation occurs, backward protrusion by no means necessarily follows, but radiographically the disk space becomes much narrowed and secondary osteoarthritic changes usually appear. Thus a normal disk space does not exclude the diagnosis of a protruded disk, and a grossly narrowed space is not proof of protrusion.

Four out of five cases get better when treated conservatively, and an even higher proportion of cases of lumbago are restored to health,⁴ but for the residue of cases surgery is usually the treatment of choice. The fact that it is not always—even though very often—as dramatically successful as drawing a tooth has been largely responsible for the mass of literature on the disorder. And, just as occasionally the cause of the pain is not a tooth at all, so with disks. Myelography helps in diagnosis, but it has the more important function of revealing a tumour—usually benign—which may lie several inches higher up the spinal canal and be quite invisible at low lumbar laminectomy.

In many centres in Britain there is a prejudice against myelography, especially among orthopaedic surgeons. Their distaste for all contrast media, gas or liquid, is great. The opinion is sometimes expressed that the method is not without danger and that serious sequelae, especially arachnoiditis, are common. Again, no contrast substance, even with the best technique and interpretation, reveals all protruded disks. And critics also contend that the procedure is not only harmful but redundant, since clinical diagnosis is so accurate. On the other hand, at most neurological centres in this country myelography is held to be an essential investigation. At the Lahey Clinic 4.3% of 1,104 cases operated upon for supposed disk lesions were tumours of the cauda equina.⁵ Love⁶ reported that eight spinal tumours, whose signs simulated those of disk lesions, were removed at the Mayo Clinic during the same period as 100 disk lesions were operated upon. And Barr, co-author of the paper drawing the attention of the world to the true cause of most cases of sciatica, whose opinion cannot lightly be dismissed, has said that there is only one way by which catastrophes can be avoided—routine myelography.⁷

¹ In *Cancer Res.*, 1953.² Doll, R., *British Medical Journal*, 1953, 2, 521, 585.³ — and Hill, A. B., *ibid.*, 1950, 2, 739.⁴ Wynder, E. L., and Graham, E. A., *J. Amer. med. Ass.*, 1950, 143, 329.⁵ Waller, R. E., *Brit. J. Cancer*, 1952, 6, 8.¹ Lister, W. J., and Barr, J. S., *New Engl. J. Med.*, 1934, 211, 210.² Knutson, F., *Irish J. Radiol.*, 1953, 26, 113.³ Logue, V., *J. Neurol. Psychiat.*, 1952, 18, 227.⁴ — *Postgrad. med. J.*, 1953, 29, 234.⁵ Toumey, J. W., et al., *J. Bone Jt Surg.*, 1950, 32A, 249.⁶ Love, J. G., *J. Neurosurg.*, 1944, 1, 275.⁷ Barr, J. S., *J. Bone Jt Surg.*, 1950, 32A, 266.

SELF-HELP AND PUBLIC HEALTH

We get used to hearing year by year that the health of the nation improves, so it is timely of Sir John Charles to remind us in his latest report¹ that "it is not sufficient that the man in the street should rest in a quiet acceptance of all the benefits of a steadily improving environment as if they were part of nature's boundless provision." Nature's provision is far from boundless, as is apparent to the man in the fields if not to the man in the street, and even the State's provision is the more effectual for co-operation from the people using it. But in spite of disastrous flood and fog in 1952 the citizens of England and Wales remained remarkably healthy—if the inference may be drawn from figures for notified diseases and registered deaths. Outstanding among the diminishing causes of death is tuberculosis: the death rate from all forms was 240 per million, a conspicuous fall from the average figure of 535 per million for 1945-9. By contrast 1952 was notable for deaths from cancer of the lung (14,218) much exceeding those from all forms of tuberculosis (10,585). This reversal owed more to the fall in tuberculosis deaths than to the rise in lung-cancer deaths, but the latter seem to be increasing uninterruptedly even so. We discuss elsewhere (p. 1362) some new American work on the production of experimental cancers in mice by tobacco-smoke extract, and it seems that those who are yet unconvinced of any connexion between smoking and cancer of the lung are being left increasingly little space to manoeuvre in. Another severe disease on the increase is leukaemia, with 2,043 deaths. The death rate from it has been rising for many years, and it is hardly likely that improving diagnosis can be responsible, at least for all the increase. Mortality was 74% higher than in 1938, and the comparative mortality index in the five years 1948-52 (with 1938 mortality taken as 1.00) rose as follows: 1.32, 1.50, 1.58, 1.66, and 1.74.

The figures for admissions to mental hospitals continued to increase, there being 62,258 in 1952 as compared with 59,288 in 1951 and 27,979 in 1939. But this does not necessarily imply that there are more mentally disordered people; the likelier explanation is that people nowadays more readily seek or agree to admission than formerly. Again, the number of mental defectives under guardianship and on the books of hospitals continued to rise, being 62,704 in 1952, about 1,000 more than in the previous year. But the increase is probably due to the growing recognition of mental defect as a clinical condition and social problem, and also to increasing difficulty in assimilating these people into society as industrialization spreads.

Referring to tasks that parents should be undertaking on behalf of their children, Sir John Charles finds that they are failing in their duties in some respects. "Infant vaccinations against smallpox are 70% less than they should be, and for both diphtheria and smallpox the proportion who have their immunity maintained by reinoculation or revaccination is deplorably low." Further, "the same sorry tale of parental carelessness is to be recounted in relation to dental care,"

¹ Report of the Ministry of Health for the Year Ended December 31, 1952, Part II. 1953. H.M.S.O. 6s. 6d.

and "there is something very far wrong when more children under 15 years of age die from accidents in their homes than are killed on our congested thoroughfares." The uptake of Government-provided orange juice and cod-liver oil for infants is "less than half of what it should be." There are these and other signs in this admirable report that a great many people would be better employed making some slight efforts on behalf of themselves and their children instead of crowding consulting-rooms and hospitals to repair the health they have allowed to decay from neglect.

THE MANAGEMENT OF ULCERATIVE COLITIS

None of the theories put forward to explain the aetiology of ulcerative colitis has yet led to a logical and generally effective regime of treatment. The management must therefore be based on a sound application of general principles; and in assessing the effect of the various measures adopted there is no disease in which it is more important to bear in mind the background and natural course of the malady. Wittkower¹ found that in most of these patients psychological abnormalities were present before the colitis began, and it is now widely recognized that they are people characterized by emotional immaturity, often having a pathological parental attachment and perhaps being extremely meticulous and fussy. Successful results from psychotherapy have been claimed by Daniels.² And, although the more generally held view is that only transient benefit, if any, can be expected from such treatment, it is nevertheless true that the medical care cannot be planned to best advantage without an understanding of the psychological situation and of the various emotional crises which often initiate relapses. No one is as well placed as the family doctor to evaluate these environmental factors; and it is on a correct appraisal of them, and by taking into account the possibilities of satisfactory adjustment of emotional problems, that the best estimate of the prognosis of an early case may perhaps be based.

In planning the details of treatment it is well to remember certain general considerations. At the best the illness is likely to last for many months, and acceptance of this fact by patient and doctor is the first step towards successful management. On the other hand, although remission followed by relapse is the usual sequence, apparently complete and lasting recovery is not unknown, and for this reason alone the patient should not be subjected too early to mutilating surgery. This is not to say that operation should be reserved for the moribund; selection at the right time of the right patient for ileostomy and perhaps colectomy requires the co-operation of physician and surgeon and taxes the judgment of both. Elsewhere in this issue Mr. S. O. Aylett recommends, for suitable cases, an operation which preserves rectal function. It is now fashionable to advise rather earlier surgery, which in our present ignorance is probably correct; but many will echo the words of Marino,³ who said that the more ileostomies he per-

¹ British Medical Journal, 1938, 2, 1356.

² Med. clin. N. Amer., 1944, 28, 593.

³ J. Amer. med. Ass., 1947, 133, 1001.

⁴ Hoffbauer, F. W., et al. Ann. Intern. Med., 1953, 39, 267.

⁵ Bargen, J. A., ibid., 1953, 39, 285.

formed the more he wished there were some other method of caring for these patients. In the medical treatment there is general agreement only about the necessity for complete rest, which should be continued as long as there is fever or more than two or three stools in 24 hours. Almost equally important, in view of the drain of protein from the bowel and the common occurrence in the liver of fatty change or even cirrhosis,⁴ is a high-protein diet. An adequate intake can nearly always be assured by the addition of concentrated supplements such as soluble casein. At least in the active phases fruit and vegetables must be largely excluded from the diet, and for this reason vitamin C and the B complex must be given in full doses. Anaemia is always present, and, though it may respond to the administration of iron by mouth, transfusion often seems to be of general benefit in addition to raising the haemoglobin level and should not be reserved only for the severely anaemic. During acute exacerbations courses of penicillin by injection, should be tried, though they rarely cause dramatic improvement. Again A.C.T.H. or cortisone have occasionally appeared to initiate remission in a fulminating case, but usually have little or no effect. For relief of painful colon spasm associated with wind there is probably nothing better than a tablespoonful of charcoal and 5 minims (0.3 ml.) of a tincture of belladonna three times a day, the dose of the latter being gradually increased to the limit of tolerance. The present tendency is to regard colon wash-outs as of very limited value. In conclusion it may be reaffirmed that most success in the management of this distressing disease attends those who are best able to bring continued hope, encouragement, and support to the rather inadequate and dependent sufferer.

NIGHT WORK AND SHIFT CHANGES

The effects that night work and shift changes have on output and absence from work were the subject of a recent investigation carried out by the Medical Research Council Group for Research in Industrial Psychology.¹ For the most part the results confirm the work already done in this field, but they may come as something of a surprise to readers not already acquainted with it. The most striking fact is that there is very little difference in the rates of output on day and night shifts. In two of the ten factories with which the inquiry was concerned, the output from the night shifts was in fact very slightly the higher. This may be explained away, but the fact remains that the comparative ratio in output between day and night shifts was shown to be only of the order of 101:99.

The evidence shows, however, that there are features of night work which need to be more carefully borne in mind than they are at present. The article contains an impressive table showing that the percentage of absence uniformly falls week by week while day work is continued, and uniformly rises week by week when a shift changes over to night work. Moreover, the opinions expressed by the members of a sample of workers who were interviewed showed, as might have been

expected, that night work was highly unpopular. Digestive troubles and sleeplessness were much complained of, and it is noteworthy that, out of the 150 men in the sample, no fewer than 65 took patent medicines every day or several times a week. The types taken suggest, it is said, that they were relied on "to counteract disorders of the stomach."

The authors sum up by saying that "there is not the least doubt that night work is unpopular and in the long run is detrimental to health, efficiency, and the enjoyment of life. In every group of workers, some break down in health after a few weeks, months, or years of night work. . . . Almost all workers are adversely affected in some degree." This may be thought to be a somewhat strong conclusion in view of the evidence on which it is based in this paper. Adverse comparisons between day and night work in regard to output and lost time have been difficult to make since the Health of Munition Workers Committee presented its report in 1918. Moreover, so far as shift working in general goes, the Ministry of Labour has just reminded us that Departmental Committees reported in 1934 and 1945 that they were unable "to discover any grounds for supposing that [it] increases sickness rates or the incidence of digestive or nervous disorders," though the familiar effects on family and social life were again reported on, especially in 1945. But it seems to be obvious that the serious disturbance in the pattern of daily life which shift work brings with it must have its physical effects, provided it is done over a long enough period. It is therefore to be hoped that this research will be continued by following up a sample of cases over a decade or so.

CHELATION

Chelating agents, like exchange resins, are yet another of the tools which the industrial chemist has passed on to the physician. The word chelation ($\chi\eta\eta$, a claw) indicates the ability of certain chemicals to donate atoms—usually oxygen, nitrogen, or sulphur—which will form co-ordinate bonds with polyvalent metallic ions: the result is a stable, water-soluble, non-ionic metallic "ring" in which the metal is firmly held.¹ It is important to note that the resulting compound is not precipitated. The avidity of a chelating agent for a particular metal varies. For example, lead is more strongly bound than calcium and will displace the latter from a chelated complex. The best known of these agents in practical use is ethylenediamine tetracetic acid (E.D.T.A.) (marketed commercially as "versene," "sequestrene," "trilon," "nullapon," etc.), though citric, malic, lactic, and tartaric acids are all natural chelating agents, and both chlorophyll and haemoglobin are examples of chelated complexes.

The possible uses of chelation are very numerous. It is already used in industrial processes as varied as the softening of water (by removing calcium), the removal of trace metals from dyes to improve colour, the

¹ Walton, H. F., Sci. Amer., 1951, 188, 68.

² Arch. Industr. Hyg., 1953, 7, 137.

³ Ibid., 1953, 7, 148.

⁴ Science, 1953, 117, 659.

⁵ Acheson, B. S., and Weinberg, T., J. Urol. (Baltimore), 1951, 68, 316.

⁶ Gehres, R. F., and Raymond, S., ibid., 1951, 68, 474.

⁷ Proeschner, F., Proc. Soc. exp. Biol. (N.Y.), 1951, 78, 619.

⁸ Wyll, S., and Marriott, R., Brit. J. Industr. Med., 1953, 10, 164.

preservation of food, the improvement of soils (humus contains chelating agents which bind iron and calcium), and the removal of traces of radioactive substances. As for the uses of chelation in medicine, lead poisoning is an obvious indication; and a recent conference² was called at the Massachusetts General Hospital to discuss the possibility of using E.D.T.A. in this condition. Animal studies have confirmed its ability to remove such ions as calcium, lead, yttrium, and plutonium, and if given in the acid form it rapidly causes fatal hypocalcaemic tetany. In therapy, therefore, the calcium salt should be used; this appears to be non-toxic and is not broken down, 95% being recoverable from the urine. The suggested daily dose is 1 g. per 30 lb. (14 kg.) body weight in a 3% solution intravenously for five days, followed by a rest period. Preliminary reports by Foreman³ and Rubin⁴ and their collaborators suggest that calcium E.D.T.A. may be effective during acute exacerbations of lead poisoning in man. Moreover, this form of treatment has an added advantage in that no free ions are liberated in the mobilization of lead. How much of the metal can be removed from the bones has yet to be determined, but animal experiments are encouraging.²

Chelation may have a use in arsenic and mercury poisoning. Foreman and his colleagues gave calcium E.D.T.A. to a patient with berylliosis, though with little obvious effect. E.D.T.A. has also been instilled into the bladder and renal tract to dissolve stones with some success,⁵ but it tends to cause severe mucosal irritation unless used in a very dilute solution. Proeschner⁷ has shown that very small amounts of E.D.T.A. will preserve blood for long periods without danger, and it has obvious uses as an anticoagulant. There are many other possible applications, both therapeutic and experimental, for these versatile substances.

LOUSE INFESTATION

The extent of infestation in the towns of England and Wales had scarcely been realized until the wartime evacuation scheme brought many householders in the reception areas into unaccustomed contact with the problem. Mellanby carried out an investigation into the prevalence of the head louse in England on behalf of the Board of Education,¹ and later published results of a four-year survey ending in September, 1943.² He found, generally speaking, that there was a considerable variation in the incidence of head lice in different age groups, in the two sexes, and in different areas. As the result of intense activity by various officers of the health services during the next few years, infestation by lice and nits seems to have been reduced. "Nevertheless," wrote Mellanby, "in our industrial cities nearly 50% of pre-school age children of both sexes and of school girls are verminous. Older girls and women are the only section of the population which has become lousier during the war."² The Chief Medical Officer of the Ministry of Education, discussing³ this problem, mentioned that Lieutenant-Colonel Madock carried out an investigation in 1947 similar to Mellanby's of 1942-3. It is a grave reflection on the cleanliness of our urban

population that 18.2% of patients admitted to a group of hospitals (the same as reviewed by Mellanby earlier) were in 1947 reported by competent nursing staff to be infested. At the end of this account the infestation of problem families is specially described and the use of a family service unit commended. But surely this is carrying the Welfare State too far; while some encouragement is desirable, at least the parents might be expected to keep the family reasonably clean. Ewan⁴ has stated that 11.1% of 51,349 children examined at routine medical inspections had unclean heads, and he also quoted similar figures from the statistics of other Scottish education authorities. The rates of infestation in the different wards of the city or in the different categories of schools in Glasgow are not given, but in other areas there is evidence to show from the results of routine examinations for cleanliness, particularly those carried out on the reopening of schools after the Christmas holiday, that in certain schools up to 45% of the girls in attendance may be shown to be lousy or to have nits.

Recent reports have emphasized the family as the unit of infestation. Ewan, for example, has asked that the medical officer of health for the city should be directed to apply for the reintroduction of legislation similar to the Scabies (Scotland) Order, 1941. This wartime regulation had its counterpart in England, and gave the medical officer of health power to inspect premises, to examine persons accommodated in these premises, and to compel verminous persons irrespective of age to submit themselves for cleansing. These orders resulted in the virtual disappearance of scabies; simultaneously the number of persons found to be verminous was reduced considerably.

Infestation is particularly noticeable in the second-generation immigrants in various urban areas, and the real administrative difficulty in controlling it now lies not in the cleansing of schoolchildren, which is easily carried out under the provisions of the Education Act, 1944, but in the fact that the mothers and sisters of the affected children form reservoirs of infestation. Attempts to eliminate it are frustrated by lack of powers to treat relatives in the homes. There is no power under which medical officers of health either in England and Wales or in Scotland can force persons suspected of being lousy to submit to examination, though the Public Health Act of 1936 (Section 85) authorizes him to enter premises and to deal with articles as well as the fabric of the premises if these inanimate objects are affected by vermin. There is a strong case for giving the medical officer of health powers similar to those in the Scabies Order, which ceased to be operative in 1947.

Persuasion has been tried and found wanting; home visits, either by school nurses or by the sanitary staff of the local authorities, have not been adequate to eliminate the hard core of infestation. It is surely time that the freedom of the louse to breed in a small but troublesome number of dwellings in this country was finally curtailed.

¹ Mellanby, K. *Med. Offr.*, 1941, 66, 29.

² — Ibid., 1943, 66, 205.

³ *Hlth Sch. Child.*, 1950, 1, H.M.S.O.

⁴ *Glasgow Herald*, September 24, 1953.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

GLYCOSURIA AND HYPERGLYCAEMIA

BY

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Glycosuria and hyperglycaemia are closely related because, except in those patients with a lowered renal threshold, glycosuria is always an indication that the blood sugar is higher than normal. While recent advances in our knowledge of renal physiology have invalidated the concept of a renal threshold as an unvarying and characteristic concentration of glucose in the blood—above which glycosuria occurs, and below which it does not—there is no doubt that from the clinical point of view this concept is justified and of real value. In most people the renal threshold is about 180 mg. per 100 ml., a value which the blood sugar normally never exceeds; glycosuria does not therefore occur. Hyperglycaemia with a blood-sugar concentration exceeding the normal threshold, as occurs in diabetes and in a few other pathological conditions (see below) leads to the appearance of sugar in the urine. In patients with a normal renal threshold glycosuria is absent when the blood sugar is below 180 mg. per 100 ml., a trace is detectable when the sugar concentration is around 200 mg. per 100 ml., while a complete reduction of the usual clinical testing reagents is given when the blood sugar is 300 mg. or more per 100 ml.

Glycosuria can, however, also occur without a raised blood sugar in renal glycosuria, in which condition the renal threshold is lower than normal, being sometimes as low as 80 mg. per 100 ml. The threshold is sometimes raised, especially in diabetes; hyperglycaemia with blood-sugar concentrations above the normal threshold can then occur without glycosuria.

Tests for Reducing Substances in Urine

The presence of a reducing substance in the urine may be investigated by Benedict's test* or by the recently developed "clintest" tablet test. Fehling's test is less sensitive and less specific and has little to recommend it. Benedict's test is less easy to perform properly than the clintest, which has many advantages in general practice because no external source of heat is required. The very rapid and convenient screening test using clintest with undiluted urine is especially valuable, but a positive result should always be confirmed by the standard technique recommended by the manufacturers.

Significance of Reducing Substances in the Urine

The urgency with which the general practitioner must act upon finding that the urine of his patient reduces Benedict's solution or the clintest tablet must depend entirely upon the clinical condition. Most patients with diabetes mellitus give a clearly defined history of the disease, and if a positive test for reducing substances in the urine is found in a patient with loss of weight, pruritus, thirst, and polyuria there is no point in arranging elaborate investigations to decide whether or not the reducing substance is glucose. The problem of the moment is whether the patient has diabetes, and, if so, whether the condition is an urgent one requiring immediate treatment with insulin. This will depend on the presence or absence of severe ketosis.

Reducing Substances and Ketone Bodies in the Urine.—As soon as a urine is found to contain a reducing substance,

Rothera's test* for acetone and aceto-acetic acid should be performed. If it is strongly positive it should be followed by Gerhard's ferric chloride test* for aceto-acetic acid. The Rothera reaction is much more sensitive than the ferric chloride reaction, and when the latter is positive the ketosis is more severe. Much care, however, must be taken in the interpretation of the ferric chloride test; patients who have been unwell have often taken salicylates or aspirin previously, and the distinction between the colour reaction given by salicylates in the urine and that given by aceto-acetic acid is by no means as clear-cut as many books suggest. The classical means of distinguishing the ferric chloride reaction due to salicylates from that due to aceto-acetic acid is that the latter reaction becomes negative after boiling the urine, but this is hardly ever necessary, because the patient himself will be able to say whether he has had aspirin or salicylates. A positive ferric chloride reaction due to aceto-acetic acid will be accompanied by an extremely intense Rothera reaction which will be negative if the reaction is due to salicylates.

Some difficulty might be expected if there is severe ketosis and the patient has had either of these drugs, but the presence of heavy glycosuria and ketone bodies in the urine, together with such evidence of pre-coma as recent vomiting, shortness of breath, abdominal pain, giddiness, and acetone in the breath, must be taken as an indication for immediate treatment with glucose and insulin. It may indeed be dangerous to wait for a blood-sugar determination unless facilities for this investigation are readily available. It is the opinion of those with special experience that patients in diabetic coma or pre-coma are best treated in centres with facilities for the control of this condition. All that is required, therefore, is that the patient should be given a dose of 40 units of insulin, together, if possible, with 50 g. of glucose by mouth, and then sent to hospital. In the absence of clinical signs of pre-coma a blood-sugar determination may also be dispensed with in reaching a diagnosis of diabetes if the history is typical and reducing substances and ketone bodies are present in the urine.

Reducing Substances Without Ketone Bodies in the Urine.—Matters may be very different when there are no ketone bodies in the urine. Even then the case with a classical clinical history of diabetes requires little in the way of further investigation, although it is wise never to treat a patient as a diabetic without at least one definitely abnormal blood sugar. For this reason it is unwise to institute treatment in those cases without ketosis before confirming the diagnosis. A blood sugar should be done one and a half to two hours after a full carbohydrate meal, when a figure greater than 180 mg. per 100 ml. is certainly indicative of true diabetes. However, as is shown below, the value of the single blood-sugar determination, although excellent when the blood sugar is definitely raised, is of less value when the concentration is only slightly above the upper limit of normal or when the relationship between the collection of the blood and the time and nature of the previous meal is uncertain.

On the other hand, if on clinical grounds the practitioner thinks that the diagnosis of diabetes mellitus is unlikely, a single determination of the blood sugar may help, but it is usually essential to carry out a glucose-tolerance test. It is always worth while looking for glycosuria in two samples—the early morning sample passed before breakfast and the

*See also the article in this series by Dr. H. E. Archer on "Urine Testing in the Surgery" (November 28, p. 1211).

sample taken one and a half hours after a full carbohydrate meal; glycosuria is most likely to be present and heaviest in this second sample. If in a patient not receiving insulin the amount of reducing substance in the urine is not greatly increased about one and a half hours after a carbohydrate meal, the reducing substance is unlikely to be glucose.

The identification of a reducing substance in urine is very seldom required. The value of the osazone test and of the yeast fermentation tests in distinguishing glycosuria has been over-emphasized. The osazone test is difficult to carry out, and even in the hands of the experts is not always as reliable as has hitherto been believed. Fermentation tests, too, are not always satisfactory, for many of the common varieties of yeast ferment sugars other than glucose. The recently developed paper chromatographic method of detecting and identifying reducing substances in the urine is by far the most satisfactory yet devised. With this technique it has recently been shown that in pregnancy lactosuria is twice as common as glycosuria, the former being found in as many as 50% of the antenatal patient attendances. All things considered, the identification of a reducing substance in urine should be undertaken by laboratories specializing in this kind of investigation.

A Single Determination of the Blood Sugar

In many cases of diabetes, even in those in which the clinical history is not entirely typical, the diagnosis may be definitely established by the determination of the blood sugar. The interpretation of the result obtained depends upon the knowledge of the effect of the previous meal upon the blood-sugar concentration. It is shown below that after 50 g. of glucose in the fasting condition the blood sugar normally rises from a fasting level of 80-100 mg. per 100 ml. to not more than 180 mg. per 100 ml. and returns to normal within two to two and a half hours of the beginning of the test. When instead of having 50 g. of pure glucose the food consists of an ordinary mixed meal the blood glucose will not rise quite so high but will take a longer time to return to normal. After a breakfast consisting of eggs and bacon and two or three slices of bread with butter and marmalade, the blood sugar may rise to 140 or 150 mg. per 100 ml. and yet take up to three hours to return to the fasting concentration, whereas after a typical tea of bread, butter, jam, and cake, conditions will approximate more closely to the events occurring in the glucose-tolerance test. It is clear, therefore, that with a typical clinical history a single blood-sugar determination, taken one and a half to two hours after a meal, giving a result above 150 mg. per 100 ml. will almost certainly establish the diagnosis. On the other hand, a blood sugar well below 150 mg. per 100 ml. is not diagnostic of diabetes, and further investigation is necessary by the glucose-tolerance test.

Glucose-Tolerance Test

This test is more often used to exclude the diagnosis of diabetes mellitus than to establish its presence, for it is necessary only in those mild cases free from all symptoms of diabetes in which a single determination of the blood sugar gives an equivocal result.

It is essential to give the patient a full carbohydrate diet for seven days before carrying out this test. If not, a mildly diabetic type of curve may be found in a normal person.

After a full carbohydrate regime the patient is fasted overnight, blood and urine specimens are collected and analysed quantitatively and qualitatively for sugar before and half, one, one and a half, two, and two and a half hours after 50 g. of glucose dissolved in 200 ml. of water. The urine specimens should also be examined qualitatively for ketone bodies. In the normal curve the fasting blood sugar is below 110 mg. per 100 ml.; there is a rise to less than 180 mg. per 100 ml., and a return to the fasting level within two to two and a half hours. A second type of curve which is found in normal persons is the so-called lag storage curve in which the half-hour blood analysis shows an abnormally high concentration of sugar (up to 250 mg. per 100 ml.), but

the specimens at one and a half and two hours have returned to the fasting level. Such a curve found in patients free from symptoms of diabetes is of no pathological significance and may account for the presence of sugar in the urine between half and one hour after a high carbohydrate meal, because of rapid absorption.

A normal curve is found in renal glycosuria, when sugar appears in the urine at times when the blood concentration is not abnormally high. Although renal glycosuria is usually of no pathological significance it should be borne in mind that the condition may be accompanied by other forms of renal tubular dysfunction causing amino-aciduria and, or alternatively, abnormal phosphorus excretion leading to persistent rickets. Such cases are rare, but the condition should be borne in mind when glycosuria without symptoms of diabetes is found in childhood. Indeed, all cases of glycosuria in childhood should be referred for diagnosis to a diabetic clinic.

The glucose-tolerance curve is abnormal and usually due to diabetes when the fasting blood sugar is above 110 mg. per 100 ml., the blood sugar rises to a level above 180 mg. per 100 ml. and fails to return to normal values within two to two and a half hours. However, abnormal curves may also be found in sepsis, carbohydrate starvation, hyperthyroidism, severe liver disease, Cushing's syndrome, and some cases of acromegaly, in all of which glycosuria may occur. Usually the non-diabetic causes of an abnormal glucose tolerance are obvious from the clinical findings and the abnormality is not very great.

Glycosuria and Hyperglycaemia in Known Diabetics

Glycosuria and hyperglycaemia must also be considered in relation to the known diabetic, possibly on insulin treatment, who is being controlled by the practitioner. The insulin requirements may be readily assessed by means of routine urine tests for glucose and ketone bodies, but occasional blood-sugar determinations are of value. The time at which the blood or urine should be collected depends upon the type and number of doses of insulin the patient is receiving. Sometimes an early morning specimen may be the best, sometimes the midday specimen, and in other circumstances both. It is not the purpose of this article to supplant the excellent manuals on the treatment of diabetes, but a few general principles may be useful.

While usually the presence of heavy glycosuria may be regarded as an indication for increasing insulin dosage, this is not always the case. The early morning specimen may contain sugar secreted into the bladder in the early part of the night after the evening meal. Clearly a urine test carried out on such a specimen will give no indication of the dangers of early morning hypoglycaemia. For this reason the bladder should be emptied immediately on waking and a further specimen of urine passed as soon as possible before breakfast. In this way the second specimen will be an indication of the fasting blood sugar; this specimen is the one most useful in controlling the dose of protamine-zinc insulin. Similarly it is better to test the second of two specimens passed before lunch or tea in cases on a morning dose of soluble insulin.

In cases on two doses of soluble insulin the morning specimen may be useless as a guide to dosage because the evening insulin may not act long enough to prevent morning glycosuria, but at the same time any increase in insulin dosage may produce hypoglycaemic attacks during the night.

Blood-sugar estimations make treatment easier but are not always essential. In diabetics with a normal threshold periods of hyperglycaemia will usually be accompanied by a heavy glycosuria. Determination of the blood sugar in a diabetic patient receiving insulin treatment and not responding with clinical improvement may show that the patient still has a high blood sugar. On the whole, however, determinations of blood sugar in patients with known diabetes are of particular value in indicating hypoglycaemia and provide an indication for the reduction of the insulin dosage.

In any diabetic it is useful to know the renal threshold, because in patients with a low threshold insulin dosage cannot be adjusted by urine tests alone. Some reasonable control is possible if the insulin dosage is decreased when glycosuria disappears and increased when ketones appear in the urine. The threshold may be estimated by a series of analyses of sugar in the blood and urine. A convenient technique is as follows. Four hours after the morning injection of insulin the patient should empty his bladder. Ten minutes later the blood-sugar level should be determined, and as soon as possible after this, preferably within fifteen minutes, the bladder should be emptied again. No food must be taken from an hour before the first emptying of the bladder to completion of the test. The patient has a low renal threshold if more than slight traces of sugar appear in the second urine specimen and the blood-sugar level is below 160 mg. per 100 ml.

Collection and Preservation of Blood for Sugar Determination

Blood collected for analysis of its sugar content must be preserved with one drop of formalin or by the addition of potassium fluoride. It is best, however, to obtain prepared tubes from a local laboratory.

Most of the methods for determination of blood sugar are not entirely specific and the values are usually 15-25 mg. per 100 ml. higher than the true amounts. The figures for sugar concentration given in this article refer to capillary blood; it is important to remember that the content in venous blood is less than that in capillary blood. The difference is not great during fasting, but after a carbohydrate meal it may amount to as much as 20-70 mg. per 100 ml.

Next article on Clinical Pathology.—"Evidence of Gout," by Dr. Oswald Savage.

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

CHANGES AND PROSPECTS IN MEDICINAL TREATMENT

SIR HENRY DALE'S HARBEN LECTURES.

Sir Henry Dale, O.M., delivered the three Harben lectures, 1953, at the Royal Institute of Public Health and Hygiene on December 7, 8, and 9, taking as his subject, "Changes and Prospects in Medicinal Treatment." The chair was taken on the successive evenings by Sir Henry Tidy, Dr. J. Browning Alexander, and Sir Arthur MacNalty.

TREATMENT OF PRIMARY CAUSES, INFECTIONS, IMMUNOLOGY, AND CHEMOTHERAPY

In his first lecture Sir Henry Dale began a review of the remarkable changes which, during the past half-century, and largely in the recent quarter, have so transformed the whole aspect of medicinal treatment of disease that what was earlier recognized, by doctors and patients alike, as one of the more backward and ineffective aspects of medical activity had become one of the most successful and scientifically progressive. Medical men of his own generation hardly needed to be reminded of the days when "doctors' medicine" formed the target for a grim kind of humour. There was then a great disparity of aim and interest between the pharmacology of the laboratories and the therapeutic practice of the wards. What pharmacology had to say even about the action of the few unquestionably valuable drugs at that time had little reference to their therapeutic use. Paul Ehrlich complained of the pharmacologists of his time that if he asked them how quinine produced its effect they

would tell him how it acted on the frog's muscle or on the mouse's brain, when what he wanted to know was how it specifically attacked the malaria parasites, causing them to disappear from the blood of a sufferer from malaria. What he wanted to know was how certain doses would cure the patient, not how large doses would poison him.

The lecturer illustrated some of the conditions which prevented the development of therapeutics as a science at a period well within living memory. He said that he mentioned these bygone anomalies and frustrations only to serve as a background for a discussion of the predominant factors which had brought about an astonishing change, a veritable transformation of the whole therapeutic outlook, in recent years.

The stimulus came largely from what at the time appeared to be an essentially new idea in therapeutics, the idea that a medicine should be used to remove or prevent the cause of a disease or a failure of health, whereas the most that had been previously expected of any medication was the relief or mitigation of symptoms, except perhaps in obvious cases, such as the removal of intestinal worms, where the cause of a disease had been readily visible to the naked eye. Of course, the relief of symptoms might still be the most immediate need for the patient and the most urgent duty of the physician. Nobody would depreciate the value of digitalis because it was essentially a remedy for symptoms, not an agent for the eradication of the cause of them, or because pharmacology might not yet have completed its account of the way in which the active constituents of digitalis produced their effects.

The Fertile Nineties

It was, however, to the conception of radical treatment of the primary causes of disease as the initiating stimulus in this new development that he would, in the first instance, ask special attention. The decade beginning with 1890 had a special significance in this respect. During that decade there were also profound discoveries in physics—the discoveries of Röntgen, Becquerel, J. J. Thomson, and Rutherford. The first two years of that decade saw the advent of three new lines of medicinal treatment, all concerned with the eradication, removal, or prevention of the primary causes of disease. These were the discovery by Emil von Behring of the diphtheria and tetanus antitoxins, Paul Ehrlich's first (though not practically successful) trial of chemotherapy, and George Murray's first successful treatment of a deficiency disease, myxoedema, by administering thyroid gland in myxoedema. From these separate seeds, in due course, were to develop the luxuriant growths of a progressive therapeutics based on immunology, chemotherapy, and endocrinology, respectively.

It would be possible, of course, to trace the ultimate origin of all immunological treatment to the inoculation against smallpox, practised originally in the middle of the eighteenth century, and more particularly to Jenner's vaccination introduced as that century was drawing to its close. But the last decade of the nineteenth century was surely the great fertile period. Sir Henry Dale devoted the remainder of the first lecture to a discussion of the different types of remedial agent which deal directly with diseases due to infections by actions which stop the growth of the infecting organisms and lead to their elimination. These were the natural immunological remedies and the artificial chemotherapeutic agents, including the antibiotics.

Immunological Remedies

From 1892 onwards inoculation with killed cultures of bacilli was undertaken for protection against cholera and later against plague. Afterwards came Almroth Wright's similar immunization against typhoid, effective in the first world war; and then the active inoculations against diphtheria and tetanus. Many years were likely to pass, however, before the antitoxins could be spared from the list of essential remedies; perhaps they never would be spared.

Further advances in the effectiveness of both methods of conferring immunity, active and passive, against bacterial infection seemed most likely to come from a deeper know-

ledge of the chemistry of the antigenic constituents of bacteria and their toxins. Again the first impulse to inquire into this field came from Ehrlich's well-known side-chain theory, which gave a quasi-diagrammatic but essentially a chemical conception of the relation between antigen and antibody. Most recent conceptions did little more than restate the essential idea of Ehrlich in more modern terms, with the aid of such new chemical knowledge and conceptions as Ehrlich himself would have been eager to incorporate in his theory. Such a theory, in any case, had its chief value as a scaffold for ideas, making it possible to build a new exploratory extension of the fabric of experimental research.

Chemotherapy

Already in 1891 Ehrlich was intent on the possibility of discovering new artificial compounds which would have a maximum affinity for the toxic agent or parasite with a minimal affinity for the organs of the infected animal or human being. He was trying methylene blue because it visibly stained the malaria parasite under the microscope; and, tried on the human being, it had a certain therapeutic action, though not as good as that of quinine. The first early promise of successful chemotherapy appeared in 1903, at a time, said Sir Henry Dale, when he himself happened to be working in Ehrlich's laboratory. Ehrlich and Shiga had then already discovered trypan red, which would cure a trypanosome infection in mice. From this starting-point came progress, eventually, to suramin (germanin). From another (atoxyl), development led to salvarsan, as the earliest major practical triumph of chemotherapy. In recent years other effective agents, including several antimalarials, had appeared.

In 1935 came the introduction of prontosil, and then its active moiety sulphanilamide and the various derivatives; and while this development was still proceeding Florey and his co-workers, in 1939, re-examined the possibility of producing and purifying, on a scale adequate for systematic clinical trials, Fleming's penicillin; and the curative action of penicillin had been found to extend far beyond the contemplated range of bacterial infections. It had, for example, provided an additional remedy for syphilis, so safe and effective that even the importance of salvarsan had receded. After this came the first claims of the new range of other antibiotics—streptomycin, and chloramphenicol, with a chemical structure of unexpected simplicity, and many others. There seemed to be a prospect now of an indefinite series of antibiotic agents, many of the more recent of which showed a similarity in what might be called the "spectra" of their antibiotic actions; so that it might be supposed that such a series of equivalents was embarrassing rather than useful, but that would be a hasty judgment. The development of resistant strains might give special value to a range of alternatives.

In summing up, Sir Henry Dale said that all the evidence appeared to favour the conception of successful chemotherapy as normally due to a relatively long-persistent action, involving a corresponding maintenance of effective concentration of the remedial agent in the blood—a war of attrition rather than a *Blitzkrieg*. The general type of action, at the levels of concentration normally obtainable in actual treatment, was to suppress the further multiplication of the infecting organisms rather than to kill them outright. The whole tendency of some recent evidence favoured the view that this chemotherapeutic effect was produced by rendering unavailable to the parasitic organism some essential nutrients, which its nuclear apparatus specifically required for the purpose of its normal multiplication.

He thought the rapid advance in recent years of such an intimate cellular biochemistry was likely to provide a basis for interpretation which Ehrlich would have rejoiced to adopt in place of his more diagrammatic conception. But the initiative was due to the brilliant imagination and determined scientific enterprise of Ehrlich, the centenary of whose birth was to be celebrated a few months hence, on March 14, 1954; and, by a coincidence, the following day, March 15, was the centenary of the birth of Emil von Behring, the discoverer of the diphtheria and tetanus antitoxins.

HORMONES

In his second lecture Sir Henry Dale spoke first of deficiency diseases, including conditions due to endocrine and vitamin deficiencies, in which the treatment, once the nature of the condition had been recognized, was the obvious one of replacement by administration of what was missing. Murray's treatment of myxoedema was the first example of the success of a replacement therapy. After this there was a long interval, during which, though there were discoveries in endocrinology, most of these had no direct applications to treatment by replacement. One exception concerned the rather rare condition of *diabetes insipidus*, due to a deficiency of the pituitary posterior lobe, in some cases following, perhaps, injury in the neighbouring hypothalamus—a condition which could be made good by injection of post-pituitary extract. He did not know even yet whether the new synthetic pressor principle would also have an anti-diuretic action.

He had a vivid memory of the days of disillusionment and doubt among research workers, with regard to the practical possibility of any further successes on these lines. There was at that time no warrant for assuming, from the experience thus far available, that other hormones, even if they existed, would be accumulated in other endocrine glands in such quantities as to be obtainable from them by extraction. They might, on the other hand, be so unstable in their chemical properties, that they would inevitably be lost in any method applied for their extraction. Uncertainties of this kind, and the knowledge of the failure of so many attempts, had a strong deterrent effect until there came the discovery in 1921, by Banting and Best, two young and inexperienced Canadians, who found that the diabetic hormone of the pancreatic islets could actually be extracted, and produce its remedial effects when artificially injected. This provided a new starting-point for active and progressive research in a much wider field of endocrinology.

It would be superfluous on his part to elaborate the importance of insulin in the treatment of diabetes, and its revolutionary effect so far as the sufferers from that disease were concerned. It seemed, however, that the discovery of insulin had had an effect of much greater importance in making possible other discoveries. It led to a new spirit of optimism and enterprise. The sealed book was opening at last, and the subsequent years saw further chapters disclosed. The concurrent advance in the methods of organic chemistry had been important factors in accelerating this progress. But there had been a two-way traffic, and the rapid widening of this new prospect in endocrinology had served as a powerful stimulus to the necessary advances in biological and organic chemistry. Diseases due to other hormone deficiencies came in succession under treatment by direct replacement, and a long series of steroid hormones from the gonads and the suprarenal cortex had been isolated, and later made by artificial synthesis. This series afforded a striking example of the manner in which endocrine functions, differentiated and described in physiological terms, had been clearly associated with steroid chemical structures differing in detail, but still bearing a very close relationship in their general plan.

The qualified expert could easily take a whole course of lectures for the presentation in detail of this subject alone. Another such course might be devoted to the story of the astonishing series of functionally different hormones which had been successfully recognized as existing within the small compass of the anterior pituitary lobe. Each of these hormones had some separate function. Up to 1934 claims had been put forward by different investigators for the recognition of some nine different hormones in this one very small anterior pituitary lobe, though he did not think it could be regarded as quite certain that all of those so described were different. And the question was not made easier by some recent observations by Best and his present co-workers showing that, when the pituitary body had been removed from rats, insulin itself would act as a growth-promoting hormone in the sense that regular injection evoked a renewal of the normal growth.

He thought it should be noted, before leaving this aspect of the general subject, that the instances of a completely successful treatment of a hormonal defect, by direct replacement of what was missing, were still not numerous. The thyroid gland and its constituents in myxoedema, posterior lobe extract in *diabetes insipidus*, and insulin in *diabetes mellitus* were still the outstanding examples, though many successes of a lesser kind could of course be claimed.

Another point to which he wished to draw attention, concerning the therapeutic use of hormones, was that physicians, in more than one important instance, were employing these or their artificial analogues, not to replace defects in the ordinary sense, but to produce their physiological actions at intensities above the normal, physiological range. This was true of the use of oestrogenic hormones, or the analogous stilboestrol, to restrain the growth of prostatic cancer in the male, and testosterone to restrain the growth of mammary cancer in the female. A more conspicuous example was the use of cortisone and A.C.T.H. to allay pain and swelling in the joints in rheumatoid arthritis; and he asked his audience to note that these uses of hormones, for purposes other than the repair of hormonal deficiencies, provided a bridge between the treatment of causes and the treatment of symptoms.

Vitamins

Sir Henry Dale turned next to the accessory nutritional factors or vitamins. This was far more ancient history. The antiscorbutic value of fresh fruits and vegetables had been discovered, forgotten, and rediscovered almost in each century from the sixteenth onwards. Even during the first world war support was still being given on high authority to the idea that scurvy was due to acidity or reduced alkalinity of the blood. The value of cod-liver oil in rickets was discovered in 1840, but even after the first world war rickets remained a pathetically frequent malady amongst children in industrial areas. Then came the work of Mellanby on rickets, which, with the earlier researches of Hopkins and others on the more general significance of such dietary deficiencies, initiated an amazingly rapid advance of knowledge in this field.

Looking back, one found it difficult to believe that even for some years after the first world war the belief was still current that vitamins were substances present in such minute proportions in such complex mixtures, and probably so unstable, that it was quite doubtful whether any of them would ever be isolated or made otherwise accessible to detailed chemical examination. But between 1926 and 1939 at least 10 vitamins had been isolated, identified, and made artificially. Here again, as in the case of the hormones, this progress, when it once began, was astonishingly rapid.

Antihistamines

After glancing at the claims and uses of the various vitamins as practical remedies, Sir Henry Dale devoted the remaining section of this lecture to the introduction in recent years of the antihistaminic series of remedies. This illustrated what appeared to him to be, possibly, a new phase in therapeutic enterprise—the discovery of remedies preventing the action of a substance—histamine in this case—which had been recognized as the common, proximate cause of the symptoms of a group of diseases and pathological syndromes.

SUBSTANCES MODIFYING THE TRANSMISSION OF NERVOUS EFFECTS

In his closing lecture, before proceeding to some general conclusions, Sir Henry Dale discussed another example of recent advance based upon new and still progressive knowledge of the chemical changes concerned in the natural reactions of the body. This dealt with the activities and therapeutic possibilities of substances, both natural and artificial, which modified the actions of chemical transmitters of nervous effects at synaptic junctions. It had been known for nearly 40 years that acetylcholine had stimulating actions, not only on the plain muscle and gland cells responding to

autonomic nerve impulses, but also on the nerve cells of the peripheral ganglia and on the motor end-plates of voluntary muscle fibres; and that these latter actions were susceptible to the paralyzing effects of curare and of excess of the primarily stimulant nicotine.

Until a few years ago curarine and its substitutes were chiefly of interest as pharmacological curiosities and as technical aids in physiological experiment. It was only in recent years that the true meaning of curarine action was discovered and shown to be essentially a suppression of the normal sensitiveness of the end-plates to acetylcholine. This, together with the isolation of a pure tubocurarine by H. King, had made it possible to use curarine for the production of a paralysis of the voluntary musculature, as a supplement to anaesthesia in operative surgery.

He entered upon a detailed discussion of the paralyzing and transmission-blocking agents at the neuromuscular and ganglionic synapses, and referred in particular to the paper in the *British Medical Journal* of December 5 (p. 1237) on the use of an artificial hypothermia in conjunction with autonomic block and paralysis of voluntary muscles.

RETROSPECT AND PROSPECT

In concluding his lectures Sir Henry Dale spoke in somewhat wider terms of the progress of 50 years. After saying that not so many years ago he would have recoiled from the rashness of the forecast he had been making, he went on:

"I have seen so many cases, one after another, in which pessimism with regard to therapeutic possibilities has been suddenly put to shame by a courageous initiative. I have seen so many diseases, long regarded as beyond any reasonable hope of cure or relief, brought within the range of a medicinal treatment which has dealt with the primary cause directly, eradicating it or showing the way to prevent its occurrence, and thus banishing the disease from a whole community, or rendering it relatively innocuous. And I have seen these things happen so many times, and have been watching their frequency gather speed so continuously now for more than half a century, that, so far from finding myself subject to the disillusionment proper to my age, I feel bound to regard an attitude of hopeful, even of confident expectation concerning further developments in this direction, as not merely excusable, but as the only attitude which can be scientifically justified."

He went on to speak of the impressions left on his memory of the therapeutics of his student days at the turn of the century. His main impression was the lack of any effective medicinal remedies for almost all the serious illnesses, acute and chronic, which came to hospital for treatment—cases of *diabetes mellitus*, of pernicious anaemia, for example, admitted for observation or as subjects for teaching, without any hope of anything effective in the way of treatment, except, as one physician said, "to prolong the poor fellow's life by making the rest of it not worth living." In rickets there was at the time of which he was speaking a sound empirical observation waiting to be applied, but only fanciful aetiologies and treatments, till research showed the way much later. Diphtheria was the only infectious disease for which a specific treatment was then available. For the other acute infections—pneumonia, meningitis, erysipelas, septicaemias, or the common infections of childhood, none was yet in prospect. For none of these could anything be really done except to isolate the patient when necessary for protection of the community, and to keep him reasonably warm and quiet, and to administer anything likely to give him rest and keep up his strength. For the rest, the *vis medicatrix naturae*. Such therapeutic innovations as the newer types of remedies dealing with the proximate causes of symptoms were still far below any visible horizon. Only here and there were there any signs of the great change which was soon to begin; there was still but little general and positive advance from resources and methods which had been available 50 years earlier. The former drastic purgings and bleedings had been discarded, but there was little in the way of fresh therapeutic enterprise, and the prevailing mood was one of a placid acceptance, or of a cynical scepticism.

They had seen how all that had changed. Salvarsan, insulin, thyroxine, sulphanilamide, penicillin, the steroid hor-

none, the antihistamines—these and others he had mentioned as examples of the way in which therapeutics was now progressing.

Further Advances

What further advances were in prospect? An observer of the general situation would have the hope, if not the confident expectation, of further important advances in the curative or, better, the preventive treatment of the common virus infections. Anybody unacquainted with the technical difficulties might reasonably inquire why, after more than 150 years, we had not any method of preventive inoculation, comparable with Jennerian vaccination against smallpox, for most of the still common virus infections of our temperate zone. The real trouble was that hitherto the viruses which people had succeeded in cultivating outside the body happened, unfortunately, to be those like influenza for which no solid immunity was acquired, even from an attack. It could only be said that there was so much accumulated experience and trained ingenuity now employed on relevant researches that it ought not to be long before there was discovered a generally applicable preventive inoculation against one or more of the diseases of this group, or perhaps an effective treatment by some antibiotic or other remedy.

What was going to be done with all this new knowledge? The position had been transformed, as compared with that of only 20 years ago. The change had been, on balance, enormously for the better. The question was bound to arise, concerning the limits of the individual intelligence to absorb, to understand, and to apply all this swelling flood of genuine and potentially useful new knowledge. He had been conscious, during this lecture, when speaking of the intricacies of the different types of paralyzing and transmission-blocking agents at neuromuscular and ganglionic synapses, of his own difficulty in expounding, even of being certain that he himself understood completely some of these developments, although they were related to a range of physiology which had been that of his own special interest and concern. And he had wondered how the student of medicine was to be brought into contact with these things, and so to absorb them as to use them safely and intelligently in his practice.

This kind of educational problem, due to the increasing range and complexity of knowledge, was common, of course, to all branches of the medical discipline, and indeed to the learning of all the natural sciences; though it might be suspected that it was unusually acute in medicinal therapeutics on account of the rapid extension there from such small beginnings to this embarrassing abundance. Yet, here as elsewhere, the problem had somehow to be solved. He had himself long felt a strong conviction that the central aim of any scheme for a national health service ought to have been—ought still to be—to deal with this problem, of providing such technical facilities and assistance, such ease and regularity of access to expert advice and consultation, as would enable the individual practitioner to bring the highest practicable proportion of all this new knowledge that research is now producing, and would continue to produce, to the service of his patients, in the diagnosis and treatment of their ailments, with all the help that science could progressively offer.

THE DOCTORS' DISEASES

Addressing his fellow actuaries recently, Mr. E. A. J. HEATH, manager of the Medical Sickness, Annuity, and Life Assurance Society, was concerned mainly with the problems of "permanent" or "non-cancellable" (that is, by the Society) insurance for sickness. But he had also much of interest to tell about the cause of sickness among the members, most of whom are men doctors. Comparing two peacetime years, 1937 and 1952, there was actually a reduction in

the rate of claims for benefit owing to the occurrence of an influenza epidemic in the former year but not in the latter. Still, it was reassuring to hear that, unlike some industrial experience, there had been no general increase. Within this picture there were remarkable changes, however, that mirrored some of the recent trends of morbidity in the general population. Claims for septic infections were three times commoner in 1937 than in 1952; there were no claims for scarlet fever or diphtheria in the later year. Appendicitis was only half as common in 1952, and why this should be so was not at all clear. Surprisingly, pneumonia seemed to be commoner in 1952, though disability was probably much shorter, and as a cause of death pneumonia was now "practically non-existent." The speaker was dealing, of course, with a membership that ceases at 65 years of age.

A Fashionable Complaint

The other side of the balance sheet showed an increase in the claims for an assortment of conditions—for virus infections, for "disks," possibly for cancer, and, dominating the picture, for coronary thrombosis. This is what Mr. Heath had to say about "disks":

"In 1937 there were 47 claims for lumbago, sciatica, sacro-iliac strain, and so on, on the average of fairly short duration. In 1952 there were only 29 such cases—but no fewer than 35 cases of prolapsed intervertebral disks, with a definite increase in the average period of incapacity. I am told that prolapsed disks have been found in skeletons 2,000 years old, but they have only been rediscovered since the war, and very much to the cost of companies doing sickness insurance. Fortunately the drastic operation which was in vogue a few years ago has already fallen out of favour and disks tend more and more to be treated conservatively." It is not often that fashions in diagnosis—and treatment—are documented so neatly.

Coronary Thrombosis

The increase in coronary disease may be represented by these numbers: 9 claims in 1937, including 1 for angina pectoris, and 24 claims in 1952, including 4 for angina. (The figures given for 1952 were all "adjusted" figures, to allow for the changes in the number of members between 1937 and 1952 and the increase in the average age of the members.) Scrutiny of the other cardiovascular claims in 1937, and review of all the other information on the subsequent history of the claimants now available yielded another 6 cases in that year that might conceivably have been "missed coronaries." This procedure (which was not applied to 1952) permits a more conservative comparison of 15 claims in 1937 with 24 in 1952—similar figures to those of the deaths from coronary disease, 6 and 9 respectively. In addition there were 3 "chronic" cases of coronary thrombosis in 1937 and 8 in 1952. On the other hand, there was no apparent increase in these 15 years in the claims for intracranial vascular disease and high blood pressure.

Mr. Heath summed up the outlook in coronary thrombosis as "roughly speaking, one-third die within a day or two, one-third recover in 3 months, and one-third are incapacitated for 6 months or even for many years"—figures not unlike the results of the exhaustive analysis of prognosis in the same material reported previously in our columns.¹ Coronary thrombosis, he said, was probably "the biggest medical problem which life office actuaries have to face to-day, and it is even more important in the sickness field," which is not surprising in light of the observation of Morris and his colleagues that one in five members joining the society at the usual age may expect to suffer from coronary heart disease before reaching 65, and that a third of all the deaths are so caused.

¹ Morris, J. N., Heady, J. A., and Barley, R. G. (1952). *British Medical Journal*, 1, 508.

Reports of Societies

USE AND ABUSE OF REST

On November 24 at the Royal Society of Medicine the Section of Medicine, with the president, Sir HENRY COHEN, in the chair, held a discussion on the use and abuse of rest as a therapeutic measure. In opening the discussion Dr. G. E. BEAUMONT extolled the value of rest in medicine. Although there was a modern tendency to emphasize rest for the mind as well as the body, it was remarkable how quickly a patient became indifferent to his worries when he took to bed with an acute illness. Even more remarkable was the mental tranquillity so often seen in chronic illness: indeed, the patient with an empty mind, who adjusted himself easily to prolonged rest, often derived most physical benefit from treatment. Patients in hospital were sometimes disturbed by visitors, visiting-hour often being followed by a rise in the patient's temperature.

Physical rest was of paramount importance in the early treatment of poliomyelitis. In pulmonary tuberculosis, many of the results obtained by prolonged bed rest in the old days compared favourably with the achievements nowadays attributed to chemotherapy. Treatment by pneumothorax or thoracoplasty was an adjunct to rest, but the physical exercises which had become part of the treatment in patients with pulmonary tuberculosis subjected to pulmonary resection were contrary to the basic principles of treating tuberculosis, and might activate latent foci in the opposite lung. Sciatica had once been treated vigorously though unsuccessfully by physiotherapy, but now it was suggested that prolapse of the intervertebral disk was the true cause of sciatica, and so patients were being successfully treated by rest. In rheumatoid arthritis treatment by complete bed rest for many months was better than subjecting the patient to the rigours of physiotherapy and spa treatment. It should be the physician's aim to treat fewer patients more thoroughly.

The Hazards of Rest

Professor W. MELVILLE ARNOTT emphasized the abuse of rest in treatment. Rest was often loosely applied to mean periods of relief from work. The erroneous belief that hard work caused disease was readily accepted by doctors who were reluctant to admit their ignorance about the cause of disease and by patients who avidly welcomed such a palatable explanation of their woes. The main drawback to rest was that it could be definitely harmful. Rest was a "drug of addiction," but unlike other such agents its prescription was untrammelled by law. It was traditional to rest sick people, but proof of its value was lacking. When young people were put to rest many adverse metabolic and circulatory changes could be demonstrated. In elderly patients the hazards were even greater. It was common knowledge that incontinence in the aged could often be cured by the simple expedient of getting the patient out of bed, and alimentary function improved when a bedside commode was substituted for the bed-pan. It was remarkable that bed rest was seriously considered as a therapeutic measure, since its use was not even backed by tradition. Rest was a habit which had arisen from the principles of Hilton's *On Rest and Pain* and which had been perpetuated by the influence of the hospitals where the bed-pan routine and thoroughness of nursing had encouraged treatment in bed. An excess of rest, like an excess of drugs, was a burden on the Welfare State.

The Surgical Patient

Professor C. A. WELLS thought that many of the principles underlying treatment by rest were out of date, since we were now able to alter the course of so many diseases by modern therapy. It was essential to distinguish between the need for local rest for a diseased organ and general rest for the

whole body. The symptom of pain could sometimes be treated by active means, as in the treatment of angina of effort by sympathectomy. Nowadays the main value of institutional treatment in pulmonary tuberculosis was to ensure that a complicated regime of chemotherapy was carried out, but the principles of resting diseased joints remained unchanged. A combination of rest and exercise was often the most successful way of treating orthopaedic disorders. In the field of general surgery early post-operative activity and ambulation had greatly reduced the risk of thrombo-embolic complications.

The newest approach to rest therapy was the process known as hibernation. By paralysing the heat-regulating mechanism and by cooling the body it was possible to produce a state of profound depression in which oxygen consumption was lowered without risk of cerebral or cardiovascular damage. In this state of almost completely suspended animation it was possible to carry out surgical operations while minimizing the risk of surgical shock and abolishing many of the harmful post-operative metabolic disturbances.

Rehabilitation

Group-Captain C. J. S. O'MALLEY discussed the place of rehabilitation in the treatment of disease. The need for rest in some diseases had decreased since the introduction of antibiotics. Although rest was still required in the acute phases of a disease, it was often found during rehabilitation that much effort was needed to overcome the apathy and ennui arising from too much rest. In rehabilitation centres it was vital to strike a careful balance between rest and activity. The timing of treatment was also important, especially in poliomyelitis, where complete rest was needed in the early stages. Active rehabilitation had reduced the length of disability after surgical operations in men on active service and in factory workers. During rehabilitation periods of relaxation were necessary: remedial games and work therapy helped to balance work with leisure. In many diseases, such as prolapsed intervertebral disk and osteoarthritis, exercises aimed at maintaining good muscle tone were most valuable. Patients with psychoneurotic disorders often responded well to rehabilitation, especially if they could be brought into contact with patients recovering from severe organic disabilities. Treatment in an active rehabilitation unit not only accelerated a good functional recovery but it was much more economical than prolonged treatment in hospital.

Nova et Vetera

TALES OF A POMANDER

The Gold-headed Cane. By William Macmichael, M.D. Seventh edition with foreword by James J. Waring, M.D., and preface by William J. Kerr, M.D. Containing the text and illustrations of the fifth edition, including the introduction by George C. Peachey. (Pp. 185; illustrated £2 7s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

The title of this most readable of books on medical history may need explanation. Even within living memory the costume of doctors was almost as distinctive as that of the clergy. For centuries before that, part of their equipment was a long cane, the spherical head of which was a "pomander" and contained sweet-smelling herbs, thought to be preservative against infection. The pomander itself died out in the seventeenth century, but until the end of the eighteenth the doctor was distinguished by his elaborate and expensive stick. Such a cane was owned by John Radcliffe (1650-1714), most successful and least literate of the great doctors of the age, who, owning no books and reading none, left a fortune to endow a library. From him the cane passed successively to Richard Mead (1673-1754), Anthony Askew (1722-1774), William and David Pitcairn, uncle and nephew (1711-1791 and 1749-1809), and Matthew

Baillie (1761-1823). None except the last made any important contributions to medical science, but all in their day were famous and successful physicians, undoubtedly alleviated much suffering, and accumulated what seem to-day incredible sums from their practices. All were shrewd, far-seeing, kindly men of great personal prestige and peculiarly resourceful in relieving symptoms. Which of us in sickness would not wish to be attended by such a one?

It is the peculiar skill of the author of this work, William Macmichael (1784-1839), that he brings all this home to the reader. The method of endowing an inanimate object with the power to relate its experiences has been often tried, and by several good writers. With this one exception the result has always been failure. Macmichael alone, so far as the reviewer's knowledge extends, has been triumphantly successful in his handling of this clumsy and rigid device, and the book fully deserves its popularity. The first edition of it appeared in 1827; this, the seventh, has a preface by Professor J. J. Waring, director of the tuberculosis institute of the University of Colorado, and an introduction by Professor W. J. Kerr, of the University of California, together with the learned and amusing essay on the book by the late Dr. G. C. Peachey. It is by far the most beautiful of the seven editions, each of which is itself a bibliophile's piece. The ancient cane rests at the Royal College of Physicians of London. It is entertaining to learn that a replica of it is now awarded as a prize at San Francisco:

"To sounds that echo further West
Than its sire's Islands of the Blest."

CHARLES SINGER.

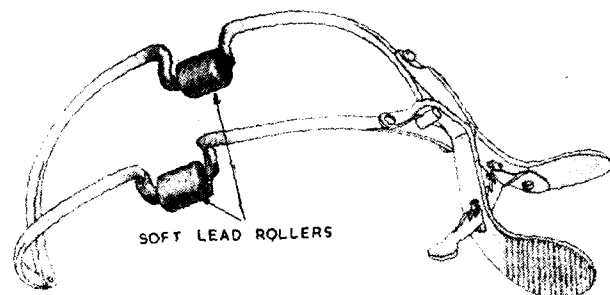
Preparations and Appliances

A MODIFIED WHITEHEAD GAG

Dr. A. OWEN-FLOOD, consulting anaesthetist, Hornsey Central Hospital, writes: Deciduous teeth extracted by means of a mouth gag during tonsillectomy can give the surgeon and anaesthetist cause for concern. The anaesthetic, of necessity deep enough for insertion of the gag, must at the same time allow a prompt return of the reflexes, and is thus, at the best, of a swinging type with a fairly stiff jaw.

The three danger points are: inserting the gag; the liability, when using the adenoid curette, of undue pressure on the front teeth; and taking out the gag with the jaw stiffening.

To a Whitehead gag, ideal for the partially toothless, giving an even pressure all round the jaw, I have fitted soft lead rollers where the gag is supposed to fit behind the front teeth (see illustration). This device makes insertion



of the gag simple and atraumatic, acts as a buffer against the shaft of the curette, and facilitates removal with a jaw beginning to tighten.

Any handy hospital engineer can fit these rollers, which are jointless, but care must be taken that they will not become loose and fall into the mouth. It is essential that they should be applied in a strip and be thick, so that on being bitten they do not alter their shape and thus cease to roll.

Correspondence

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

Carcinoma of the Female Breast

SIR.—Mr. David Patey's recent letter (*Journal*, November 7, p. 1046) raises a number of interesting points in connexion with our article on carcinoma of the female breast (*Journal*, October 10, p. 787).

The question of how effectively irradiation can destroy cancer in the axillary and internal mammary glands is a difficult one to answer and we, of course, did not investigate this directly. Elsewhere, one of us has jointly reported the results of histological investigation in a series of irradiated tumours and we would agree that irradiation does fail to sterilize the glands in a fair number of cases. It is, however, extremely difficult to decide about the viability of cells in histological sections. In so far as our recent series can give an indirect answer to this question, it seems possible that incomplete sterilization of the axilla is unimportant in a majority of cases, since so many of these already have more distant spread. However, a patient with a solitary deposit in a low axillary gland and no distant metastases should be better off with that gland removed. There can be no doubt that such cases are few in number, that clinical assessment can be most misleading, and that there is no way of recognizing them prior to operation and full pathological investigation. If we could confidently recognize these cases, then, notwithstanding the greater morbidity, it would be logical to do a radical mastectomy in order to offer them the best chance of survival and the least chance of local recurrence. We would largely agree with Mr. Hedley Atkins's view, reported in your leading article (*Journal*, October 10, p. 817), that in terms of survival it is likely that in a small fraction of cases only does the method of treatment really matter. In terms of morbidity, however, the method of treatment does matter to a much larger number of women.

Mr. Patey has also raised an important point about the technique of simple mastectomy. It is true that some of the axillary glands are bound to be removed if the axillary tail of the breast is properly dissected, and Mr. Patey is right in saying that it is a question whether axillary dissection should be complete or limited.

In turning to the subject of the internal mammary glands, Mr. Patey writes that we "appear to assume that irradiation of the internal mammary chain is efficient." We have no evidence on this point, but it is likely that irradiation of these glands is no more and no less efficient than of those in the axilla. It is likely, however, that the number of cases in which super-radical surgery can effect survival is very small, and once again we have no means of predicting these cases beforehand. If we are to do the greatest good to the greatest number it would seem likely that super-radical surgery is unjustifiable. We stand corrected if we seem to have condemned this method without trial, but we do submit that such signs as there are point strongly against any more heroic surgery. If the experiment is to be continued we would plead that it should be a carefully controlled one from the outset. The radical operation was accepted for many years without any proof of its value, and it would be regrettable if it took as many years and the suffering of many women to prove that super-radical surgery is unjustifiable as well as mutilating.

We are glad that Mr. Patey has questioned our local recurrence index. As stated in our paper, the method was put forward in order to stimulate comment and criticism. In a retrospective survey, such as we presented, it was very difficult to collect adequate and accurate information on many points. The simple surgery group included many cases which were treated by very limited local surgery and our numbers did not allow more detailed analysis. The local recurrences included a wide variety of circumstances—for example, a fresh or recurrent tumour in a case treated by local excision only, and recurrences in the skin or chest wall following mastectomy, as well as recurrences in the undissected and dissected axilla. If further investigation reveals that local recurrence is less common after radical than after adequate simple mastectomy (and we would emphasize the word adequate, since the latter operation is sometimes carelessly performed),

then this will be an important point in favour of radical surgery. It may be that in the past too much emphasis has been placed on survival figures and too little on morbidity and local recurrence. If two hypothetical and identical cases, A and B, are considered, the one treated by radical and the other by conservative surgery, it may eventually prove true that case A has the greater chance of a swollen arm, and case B the greater likelihood of local recurrence. If both cases survive for the same time it becomes extremely difficult to assess the merits and disadvantages of the two methods of treatment.

Though our own advocacy of conservative surgery may be partly demolished in the process, we would earnestly ask all workers to give very careful attention to this problem of local recurrence. In the meantime it is our considered opinion that, in the absence of any more exact method for really accurate pre-operative assessment of our cases, the greatest good and the least harm will be done to the largest number if less radical surgical methods together with radiotherapy are used in the great majority of cases.—We are, etc.,

R. S. MURLEY.
I. G. WILLIAMS.

Radlett, Herts.

REFERENCE

Williams, I. G., and Cunningham, G. J. (1953). *Brit. J. Radiol.*, 24, 123.

Malaria in Neighbouring Londoners

SIR.—The article by Drs. G. S. Crockett and K. Simpson (*Journal*, November 21, p. 1141) was of considerable interest to me. In 1950, with the co-operation of Mr. A. W. Leftwich, biology master, and the boys of the Wellingborough Grammar School, I carried out a survey of the different species of mosquitoes in the area. This area, which is a rectangle bounded by National Grid Lines E4/83 to E4/98 and N2/64 to N2/70, covers about 50,485 acres and includes the junction of the rivers Ise and Nene. The total number of specimens examined by us was 557, and of these 20 were of anopheline mosquitoes. The anopheline variety was *Anopheles maculipennis* and its subdivisions. Although the survey was far from being complete, it did show that the anopheline mosquito was no rarity in the district.

I appreciate the difficulty experienced by the writers of the article in finding the breeding ground of the anopheline mosquito, as we, too, experienced difficulty. We found the anopheline breeding in shallow reed-grown pools of overflow water from the river Nene. We also found some breeding in a water tank situated on the outskirts of a small town. The breeding grounds of the *Culex* variety were found much more easily. Adult anophelines were found to range one to two miles from their breeding grounds, and of course, if a swarm were caught by a wind, could be transported much further distances. This article brings to mind countries, given a certain period of warm weather for the malarial cycle to be completed, there is always the potential danger of primary malaria being contracted in England.

As a matter of interest, of the 30 or more known British species of mosquito, only six were found in this district. The species and numbers of specimens were as follows: *Theobaldia annulata*, 14; *Theobaldia (culicella) morsitans*, 18; *Aedes (ochlerotatus) rusticus*, 27; *Aedes cantans* (formerly *ochlerotatus housei*), 33; *Culex pipiens*, 445; *Anopheles*, 20. It is interesting to note that 60 specimens of *Aedes rusticus* and *Aedes cantans* were found. These specimens are related to the *Aedes aegyptus*, which is associated in Africa with the spread of yellow fever.

Considering the fact that mosquitoes are associated with the spread of diseases in tropical countries, one wonders if they could be the possible vectors of certain diseases in this country.—I am, etc.,

P. X. BERMINGHAM.

Wellingborough.

Costo-clavicular Compression of the Subclavian Vein

SIR.—I read with interest the article by Dr. R. Wyburn-Mason under the above title (*Journal*, November 28, p. 1198). It is true that in recent years the conception of costo-clavicular compression of the brachial plexus has been recognized as often giving rise to symptoms formerly attributed to the pressure of a cervical rib or to compression by the scalenus anterior muscle. Unfortunately, the impression that lesions causing drooping or drooping of the shoulder produce costo-clavicular compression of the neuro-

vascular bundle is still widely held. It is a fact well known to all anatomy students that when the shoulder descends the clavicle moves anteriorly away from the first rib. The further the shoulder descends the wider does the costo-clavicular interval become. Conversely, when the shoulder is raised, as by abducting the arm or retracting (bracing back) the shoulder, the clavicle moves upwards and backwards in the form of an arc, and the costo-clavicular interval becomes narrower.

The relationship of clavicular movements to costo-clavicular compression was pointed out by Professor E. D. Telford and myself in the *Journal* of March 15, 1947 (p. 325). The production of pain due to dropping of the point of the shoulder is caused by a dragging of the plexus across the tendinous anterior edge of the scalenus medius. Oedema is caused by a similar drag of the vein over the first rib, as shown by Dr. Wyburn-Mason. I quote the comment following the first two case reports in Dr. Wyburn-Mason's article: "It appears, therefore, that when the tip of the shoulder drops because of damage to or tearing of structures normally supporting it the subclavian vein may be compressed as it passes over the first rib, giving rise to venous oedema of the arm." It is significant that the author does not say "... compressed by the clavicle as it passes ...", and from this comment I think that he does not believe that the clavicle is an agent in this venous compression. The more unfortunate it is, therefore, that costo-clavicular compression is the title of this article.—I am, etc.,

S. MOTTERSHEAD.

Middlesbrough

Venepuncture

SIR.—In his article on venepuncture (*Journal*, October 24, p. 930), Dr. I. A. B. Cathie recommends the patient bending the elbow double tightly over the swab after the removal of the needle from the vein. I do not think that this common practice is the best. Not only does it dam blood back in the forearm, but it may also make a short, tight sleeve on a female patient into an effective tourniquet around the contracting arm muscles. In either case a propensity to bruising and bleeding is increased. It seems far better to leave the elbow extended and press the swab with the whole arm slightly raised. This is no more trouble than the usual method, and mishaps are less common.—I am, etc.,

Liverpool.

P. J. TAYLOR.

Fatality Following Penicillin Injection

SIR.—It seems desirable in the present state of our knowledge that every fatality following a penicillin injection should be given wide publicity. Here is another fatal case.

An apparently healthy woman, aged 31, who two years previously had been successfully treated in this hospital for phlebitis of the right leg (of unknown origin) with 53 injections of crystalline penicillin, was readmitted on September 21, 1953, for the removal of a chronic appendix. On the morning after admission she was prepared for operation, but on being given the routine pre-operative injection of morphine and atropine she passed into shock, and though she made a perfect recovery the operation was postponed for further examination of her general condition. Four days later, as nothing abnormal had been discovered, she was once more prepared for operation, but it was decided to omit the injection of morphine and atropine. A chronic appendix was removed under cinchocaine spinal anaesthesia (isotonic) and the patient left the theatre in apparently perfect condition, having had no fall of blood pressure or other untoward incident. One and three-quarter hours after being returned to the wards the patient received 50,000 units of crystalline penicillin into the buttock, and immediately, announcing that she was going to die, became cyanosed and pulseless. She succumbed 15 minutes later in spite of artificial respiration with oxygen, injections of nikethamide, caffeine, ouabain, and, finally, adrenaline into the heart.

This is the first fatal case following penicillin recorded by this hospital. Two years ago a severe case of shock was observed following the injection of 400,000 units of procaine penicillin given to a syphilitic patient.—I am, etc.,

E. H. R. ALTOUNYAN.

Aleppo, Syria.

The College of General Practitioners

SIR,—I rather gather that the movement for higher criteria for future membership of the College of General Practitioners is stronger at the moment in Scotland than it is in England. It is to be hoped that the desire for this will gain momentum in all quarters. It has been clear to me since the College was mooted in the early days of the Steering Committee that, if it is to secure equality for general practitioners with other sections of the profession, it must become, first, a royal incorporation, and, secondly, a licensing body able to issue a diploma or diplomas which will be recognized by the General Medical Council as a registrable higher medical qualification or qualifications.

Whether foundation or early members will automatically receive this diploma or not is of lesser importance at the moment. Nor is the form that the examination for the diploma should take at present in question. I do not wish to complicate the issues by referring to these disputable matters, but I do feel that at the moment the College enjoys widespread good will. To delay unduly in applying for a royal charter and in establishing a registrable diploma would, in my judgment, be most unfortunate.—I am, etc.,

Glasgow, W.3.

J. INGLIS CAMERON.

Research in General Practice

SIR,—The annotation entitled "Research in General Practice" (*Journal*, November 28, p. 1209) mentions herpes zoster as a suitable subject for study. It may be of interest to report that a small group of general practitioners working in rural areas of central Perthshire has been recording its observations on this disease for the past two and a half years. Our records are made on a standard form drawn up by Dr. P. L. McKinlay, the medical statistician to the Department of Health for Scotland.

As the majority of the members of our group are now foundation members of the College of General Practitioners it is our intention at an early date to explore the possibility of making our local inquiry the nucleus of a much bigger investigation conducted under the auspices of the College.—I am, etc.,

Pitlochry

JOHN M. HENDERSON.

Alcohol-induced Pain in Hodgkin's Disease

SIR,—Pain induced by alcohol is not peculiar to Hodgkin's disease. During the Libyan campaign of 1941 I suffered from a Brodie's abscess in the head of the right tibia. One half-glassful of beer was sufficient to cause pain of distressing severity in the region of the lesion. After confirming this curious phenomenon on two or three occasions with several types of alcohol-containing drinks, I was forced temporarily to become teetotal.

Before operative cure of the abscess I discussed the possible cause of such pain with Lieutenant-Colonel Graham, O.C. Surgical Division, 2/1 Australian General Hospital. He had himself suffered from a pyogenic infection of bone, and had experienced a similar alcohol-induced pain. We thought that the probable explanation was traction upon pain-sensitive structures (? vessels) caused by vasodilatation in osteoporotic tissue.

Growth of Hodgkin's tissue in bone may have been the cause of the pain in all instances quoted by Dr. Jan G. de Winter (*Journal*, September 12, p. 604). I have not known such pain to occur after alcohol in several other cases of pyogenic osteomyelitis, nor in cases of tuberculous osteitis and myelomatosis.—I am, etc.,

Victoria, Australia.

D. A. ALEXANDER.

Agonal Myokymia

SIR,—Recently I watched an old lady die of hypertensive heart failure. About half a minute after I heard the last heart sound the entire chest wall and shoulders rippled with fibrillary contractions of the muscle fibres. This went on for about a minute. The face was not affected and the

rest of the body was covered. The room was warm and there was no perceptible draught. It was a most striking sight.

I have never heard of this phenomenon and can recall no reference to it in the literature. One seldom sees the act of dying; one feels that were myokymia frequent at this time the ancients would have been well aware of it and that it would be described in classical writings. The only explanation I can suggest is that I saw during a minute an effect of anterior horn-cell degeneration which takes place over months in motor neurone disease.—I am, etc.,

Hutton Mount, Essex.

GAVIN THURSTON.

Medresco Hearing-aids

SIR,—Your leading article of October 24 (p. 929) dealing with Medresco hearing-aids states: "There is no doubt that the benefit extended to so many deaf people by the Medresco aid is ample return for the trouble and cost of providing a hearing-aid service on a national scale." The Medresco service has now been operating for nearly five years, and it would be wise to ask whether or not we are getting the best value for the money expended, this value to be determined in terms of hearing rehabilitation or the extent to which the hearing-aids distributed have enabled those who have received them to lead a normal life, free from the handicap of deafness. Judged in this way, the Medresco service may be found to have several serious shortcomings:

Mr. Gray and Miss Cartwright in a survey carried out for the Ministry of Health and summarized in the *Lancet* reported that the average daily use of the Medresco was 4.9 hours, and that only 18% of the aids issued were ever taken to work. The personnel of clinics have been consistent in their advice that only about one-third of the aids issued received any real use, one-third received occasional use, and the remainder were not used at all. The exclusion of commercial hearing-aids from the Health Service means that the hard-of-hearing are denied new developments as they become available. Bone conduction has just been introduced after being fully developed more than 20 years ago. Automatic volume compression, which has been featured in commercial hearing-aids for the last five years, has not yet been introduced, although it is essential in many types of inner ear deafness.

Might we not as a nation get better value for the money expended if some of this were devoted not to the giving away of free hearing-aids but to a determined drive to detect and treat deafness immediately it occurs, and particularly in school-children?—I am, etc.,

London, W.C.2.

A. EDWIN STEVENS,

President, Hearing-aid Manufacturers Association.

REFERENCE

Lancet, 1951, 1, 1170.

Antibiotics in Bacteraemia

SIR,—I was interested to read the account of a fatal case of staphylococcal bacteraemia described by Drs. W. H. Jopling and F. D. Schofield (*Journal*, November 21, p. 1140). There are, however, two points which do not seem to have been considered by the authors. First, it is known that *in vitro* tests do not necessarily correspond to *in vivo* results. Thus it is perfectly possible for a patient to be cured of a bacterial infection by an antibiotic while *in vitro* tests demonstrate the organism to be insensitive to that antibiotic. Secondly, it is also known that bacteraemias respond more satisfactorily to bactericidal drugs such as penicillin and streptomycin rather than bacteriostatic ones such as aureomycin and chloramphenicol. Such a bactericidal action is probably particularly important when the cellulose-humoral response, as in this case, was apparently defective.

For these reasons it is difficult to understand why the authors should have persisted first with repeated courses of aureomycin and secondly with 57 days of chloramphenicol in spite of repeated positive blood cultures. Apparently it did not occur to them, in spite of the results of the *in vitro* tests, that it would have been worth trying the effects of a drug such as streptomycin. Furthermore, it might also have been of avail to have given the latter drug in combination with massive doses of penicillin and benemid.—I am, etc.,

Waltham St. Lawrence, Berks.

M. ANTHONY PEYMAN.

Succinylcholine Chloride for Casualty Anaesthesia

SIR,—Referring to the use of succinylcholine chloride ("scoline") in casualty practice, my personal technique varies from that of Drs. Terence Vaz and J. M. Bishop (*Journal*, October 17, p. 885). Instead of using gas for induction and then giving succinylcholine chloride, I use the bare minimum of thiopentone and give succinylcholine chloride as much as is needed judging by the age and weight of the patient. By this method I have done over 200 cases of casualty anaesthetics for minor operations. There has not been any ill-effect in this technique. Recovery has been quick, and the patients have looked very fit. Vomiting has not occurred in one single case. Those who have criticized Drs. Vaz and Bishop have not given the matter a thorough trial. If it was dangerous there would have been at least 1 case in 200 which would have shown some ill-effects.

The details of these 200 cases will, I hope, be published soon.—I am, etc.,

Sheffield.

RASHBEHARI GHOSE.

Insulin Zinc Suspensions

SIR,—In view of the correspondence regarding the new insulin zinc suspension preparations, the following observations may be of interest. After the investigation into the use of these insulins on 28 patients which were reported by Dr. R. B. Wilson and myself (*Journal*, November 7, p. 1023), a further 42 patients were tried on these insulins in the Victoria Infirmary, Glasgow, prior to their general release on November 16. The majority of cases were similar to those in the original series, many requiring large doses of insulin (from 80 to 140 units in nine cases), but also included were nine new patients who had not previously received insulin. In this supplementary series satisfactory control was obtained with "lente" in 32, with "ultralente" in 2, with a mixture of lente and ultralente in 3, and with lente and "semilente" in 2, while in 3 cases change to the new insulin resulted in much poorer control.

In the combined series, comprising 70 patients, control was effected with a single daily injection of lente in 47 (67%), of ultralente in five (7%), and of mixtures of lente with ultralente or semilente in 10 (14%)—a total of 63 (88.5%). We have found, therefore, that lente is suitable for a majority of patients, but that the proportions of crystalline and amorphous insulins must be altered in an appreciable number of cases. In this regard, however, individual variations appear to be very great. Whereas lente insulin contains 30% amorphous, we found that the proportion of this in the mixtures required to control 10 of our patients were: 12%, 15%, 15%, 16%, 19%, 37%, 47%, 53%, 57%. I would agree with Drs. A. Stuart Mason and D. Verel (*Journal*, November 28, p. 1215) that it would be at least very premature to advocate an alteration in the proportions present in lente. Nevertheless, as very different proportions are required by some patients, the fact that ultralente is not available in the strength 80 units per ml. is a real disadvantage, as Drs. J. D. N. Nabarro and J. M. Stowers (*Journal*, November 7, p. 1027) have already pointed out.

It will be noticed that five of our cases were regarded as failures and it was interesting to find that Drs. A. Stuart Mason and D. Verel had had similar experience. One of these failures has been studied further. She had formerly taken 44 units of protamine zinc insulin, but immediately developed acute symptoms when given 44 units lente. Later it was found she obtained very good control, in fact considerably better than that with the previous protamine zinc, with a dose of 72 units lente. This produced slight hypoglycaemic symptoms in the forenoon and she is now being tried on a mixture with less amorphous insulin.

It seems that there are difficulties in changing some patients on to the newer preparations, and these difficulties require further investigation. It is to be hoped that a solution will be found, since eventually it seems very desirable that, as Dr. W. Oakley has said (*Journal*, November 7, p. 1021), both protamine zinc and globin insulins should be withdrawn. Admittedly no one would wish to change the regime of a diabetic under perfect control and so these older insulins may have to be continued for a considerable time, but I would suggest that they be abandoned forthwith for all new cases.

In our original paper we recorded no local insulin reactions with the new insulins. That such can occur, however, is apparent from the observations of Drs. Stuart Mason and D. Verel. Recently I have encountered two patients who have shown quite troublesome local reactions; both were new patients who had just started to take insulin, and it is not yet known whether this sensitivity will be overcome. Finally, it may be of some interest to record that in two of our patients using lente insulin marked fat atrophy was observed at the site of injection.—I am, etc.,

Glasgow.

IAN MURRAY.

Medical Needs in the Gold Coast

SIR,—Having only recently returned from the Gold Coast after two tours of service, I was particularly interested in Mr. Ian Fraser's view (*Journal*, October 31, p. 987) on the shortage of medical officers there. I congratulate him on his keen appreciation of the causes of the present situation, following only a short visit to the colony. From the last paragraph of Dr. K. A. Taylor's letter (*Journal*, November 28, p. 1217) I can only assume that he has not had recent experience of the Gold Coast, and I hasten to assure him that conditions have drastically changed within recent years.

I think that the most important thing necessary to bring about an improvement is a change of heart and attitude in the non-medical administrators, not only in the Colonial Office, but also in the Gold Coast Government (which is now largely African). The present situation is that a European doctor is very unlikely to be offered a pensionable appointment, though he may easily obtain one under contract. From the specialist's point of view this is very important. To take up a post in the colonies is to cut your bridges behind you, for after spending several years outside the United Kingdom it is virtually impossible to be re-employed as a specialist on your return. Drs. G. L. Alexander and H. G. Calwell both make this point (*Journal*, November 28, pp. 1216 and 1217). If the Gold Coast wants specialists it must offer permanent posts. As Mr. Fraser states, "The expatriate specialist is more valuable to the colony the longer he stays."

Arising from this is the present rigid adherence to the "staff list," which lays down that there should be so many surgeons, so many physicians, etc. This adherence is quite absurd. One African surgeon who had his F.R.C.S., and who had been doing specialist work, was kept waiting for three years before being promoted from medical officer to a vacant specialist post. The administrators should realize that it is easier to alter staff lists than to obtain specialists.

Whatever our views are on self-government, it is undeniable that the new administration in the Gold Coast has greatly increased the burden of the ordinary medical officer. This is not made easy to bear by the application of discrimination against expatriates when it comes to study leave. It is now almost impossible for an expatriate to obtain much leave. This causes frustration to the individual and an overall loss of officers to the Service. This should be borne in mind by those who appear to find Africanization more important than their country's needs.

The Gold Coast remains a great challenge to our profession. Disease, curable disease, is there in plenty, and yet there is only one doctor to more than 50,000 inhabitants. But before going to work there we must be assured of our position, and that we will not be asked to practise alongside unqualified persons. Perhaps the B.M.A. can help, but in view of the glib but efficient way they were dealt with by the Colonial Office in the discussion on pay for medical officers in the Colonial Service, only a few years ago, they will have to improve their bargaining power. However, I feel that in Mr. Ian Fraser they have a powerful weapon, equipped as he is with first-hand knowledge and his grasp of the long-overdue improvements.—I am, etc.,

Edinburgh.

D. B. SCOTT.

Press Publicity

SIR,—Many must deplore the sickening vulgarity which so often invests newspaper accounts of medical matters, such as remarkable operations. To members of the medical profession there are other grounds for concern; I mean the way in which the principal figures in such exploits are made to endure an improper publicity, and even to appear, by implication, to have given a "story" to the press.

Journalists, of course, have their living to earn, and know what the public wants; but the newspapers of this country still have a reputation for fundamental decency. If it could be made plain that a doctor's career might be in jeopardy were the Disciplinary Committee to take notice of these seeming improprieties, surely such objectionable practices would cease.—I am, etc.,

Birmingham, 15.

B. M. WILLMOTT DOBBIE.

More Social Medicine

SIR,—I must beg the courtesy of your columns to clear up a misunderstanding on the part of Dr. C. Metcalfe Brown in the criticism he makes (*Journal*, December 5, p. 1254) of my statement in the book *Social Medicine*, on orthodox treatment of diabetes and asthma.

Dr. Metcalfe Brown ascribes to me the very view (the mechanistic approach to medicine) that I am criticizing. In fact, only a few lines later I write: "All these explanations and cures aim at the parts of the body which are mainly affected; none is aimed at the fundamental causes of the disorder as a whole; and we therefore cannot rely on an infallible cure from these methods."

On diphtheria immunization, the point I make is that its introduction on any effective scale in this country was not made until 1941. This, in fact, is the year in which it was introduced by the Ministry of Health, and is quoted in all their official publications. Indeed, it was not until after this date that any appreciable reduction in diphtheria was made in this country.—I am, etc.,

London, N.W.6.

S. LEFF.

What is Ennepilo?

SIR,—In a Report to the General Board of Health on a preliminary inquiry into the sewerage, drainage, and supply of water and the sanitary condition of the inhabitants of the township of Middleton in Lancashire, the following statement occurs at page 18: "Other diseases have also been very prevalent, and assumed a malignant form, such as scarlatina, rubula, and ennepilo."

The report is by Robert Rawlinson, Esq., C.E., Superintending Inspector, and was printed in 1854 for H.M.S.O.

Can any of your readers suggest what disease may have been referred to by the term "ennepilo"?—I am, etc.,

Purley, Surrey.

J. CAUCHI.

The Pain of Perurethral Manipulations

SIR,—As the *British Medical Journal* does not reach here until six to seven weeks after publication, my comments on Dr. E. C. Atkinson's letter (*Journal*, August 22, p. 440) are somewhat belated. If perurethral manipulations are carried out with gentleness and skill, an efficient topical anaesthetic can render them in most cases almost painless. The anaesthetic agent, however, must be efficient. It is surprising that some people still use, and that some writers of quite recent textbooks still recommend, procaine for this purpose. Procaine is not a surface anaesthetic.

I agree with Mr. H. P. Winsbury-White (*Journal*, September 19, p. 674) that the cocaine-sodium bicarbonate-chlorbutol combination, used as he advises, is most effective. I also have used it for years. It should be realized, however, that no matter how effective the topical anaesthetic agent, passage of instruments along the urethra will generally cause pain if the bladder neck is put on the stretch, or if the calibre of the instrument used is more

than about 20 Fr. Like Dr. Atkinson, I have often wondered why some urologists make things so difficult for their patients and themselves by not using adequate anaesthesia.

Finally, Sir, may I make a plea for the use of the word "perurethral," which I have used throughout this letter? You will agree with me, I am sure, that no analgesic agent could mitigate the agony of the "transurethral" passage of an instrument.—I am, etc.,

Sydney, Australia.

D. C. TRAINOR.

Lead in Lollies and in Water

SIR,—In commenting further on this question your correspondent, Dr. L. R. L. Edwards (*Journal*, November 21, p. 1160) asks: "Is this distinction of a decimal place dependent in the lollies controversy on whether we regard the ice lolly as a solid or a liquid?" The answer to this is that to an appreciable extent it is, because there is strong evidence that lead is absorbed by the body more readily from simple liquids than from foodstuffs generally, in which it is more likely to be in organic combination. Possibly this outlook may have been a reason for the comparison with drinking water in your annotation (*Journal*, September 12, p. 613). Some ice lollies have a substantial content of solid constituents, but a large proportion of them are mainly water; whatever their solids content, they melt, and it therefore seems reasonable to regard them as liquid supplied in a frozen condition. Lead in significant quantity is not a natural constituent of foodstuffs. A further point which seems important is that ice lollies are consumed almost exclusively by young children, which is another reason for supporting the attitude in your annotation that the amount of lead allowed should be very low.

For drinking water an especially low limit is required because of the comparatively large volumes consumed. However, in mentioning "generally accepted maximum permitted quantity of lead in drinking water as 0.02 p.p.m." Dr. Edwards misunderstands my mention of this figure (*Journal*, October 31, p. 993), which was not given as a limit. As a maximum permitted quantity in water I mentioned the United States standard of 0.1 p.p.m.; the same figure would be widely accepted in this country.—I am, etc.,

London, S.W.1.

ROY C. HOATHER.

The Human Foot

SIR,—It was interesting to read that 14.4% of the recruits in the survey reported by Mr. D. Hewitt and Drs. A. M. Stewart and J. W. Webb (*Journal*, October 3, p. 745) suffered from foot defects prior to enlistment, and it seems worth recording the amount of trouble to which foot defects gave rise in a recent survey of a planned cross-section of the Army. The survey was carried out by the Army Operational Research Group and recorded the number of men who reported sick with foot trouble during a period of four weeks. The results at present available show that 2.1% per week of 1,246 recruits reported sick with foot trouble (the figure compares with 1.8% per week which I reported from a smaller survey of 623 infantry recruits over a period of six weeks).¹ Of 3,578 trained men studied in north-west Europe 0.9% per week reported sick with foot trouble. If one considers only those who reported sick with foot defects similar to those considered by Mr. Hewitt and Drs. Stewart and Webb, the figure for recruits was 0.6% per week and for trained men 0.07% per week.

In order to reduce the incidence of foot defects, it appears that prophylaxis must begin in early life, as Dr. Doris Craigmile emphasizes (p. 749). Meanwhile there is much that can be done to prevent existing defects from getting worse and from causing symptoms. The Army lays particular emphasis on the following measures: (a) Careful fitting of all footwear; (b) education in the care of the feet and footwear; (c) personnel selection for various occupations (taking into account each man's medical category); and (d) the use of conditioning courses, where necessary, to develop the musculature and to correct postural defects.

I am grateful to the Director-General, Army Medical Services, to the Scientific Adviser to the Army Council, and to the Superintendent, A.O.R.G., for permission to publish this letter.—I am, etc.,

Bristol.

GEORGE HUDSON.

REFERENCE

¹ *J. roy. Army. med. Cps.* In press.

Distinguishing a Psychopath

SIR,—I hesitate to add to the correspondence on the above subject (*Journal*, November 28 p. 1224), but Mr. Justice Hilbery says that he is collecting definitions of the term "psychopath" from various psychiatrists. I would like to add what is, I think, a commonsense one.

Mental diseases can be divided up into three large groups—mental deficiency, the neuroses, and the psychoses. A psychopath may not suffer from any of these and yet there is present a disease of the mind which tempts him to act in a certain manner on certain definite stimulation; which manner is clearly abnormal to his usual state and mental condition. Further, he frequently gives in to temptation, and neither risk nor punishment is a deterrent, and both are at times insufficiently potent to make him throw to one side his abnormal behaviour.

I shall now sit back and watch the legal and clinical pundits pull this to pieces, and pray that something good will come out of it.—I am, etc.,

Bromsgrove.

ANDREW SHEPHERD.

Peritonitis and Antibiotics

SIR,—Mr. N. C. Lake (*Journal*, December 13, 1952, p. 1307) has mentioned the development of general peritonitis in patients being treated with antibiotics. Since 1948 I have seen in negroes, mostly women, 16 cases of general peritonitis with moderate or absent fever, slight general symptoms, and moderate distension of the bowels, proved by aspiration of pus through an ordinary syringe. These were treated by parenteral penicillin and streptomycin in large doses together with aspiration of the pus every day or every second-day. All recovered, 14 without any operation whatever. One had a relapse one year later, the infection stemming from chronic salpingitis. The aetiology of the majority could not be ascertained. It may be said, however, that appendicitis is an unlikely cause, as it is extremely rare in the Central African negro, in whom symptoms of acute appendicitis, when they are found, more often have their origin in an inflammation of the iliac lymph nodes. In the local type of general peritonitis of low toxicity I feel that antibiotics are safer than an operation.—I am, etc.,

Stan, Belgian Congo.

A. BARLOVATZ.

Florence Nightingale House

SIR,—Advanced work for nurses was an important aspect of Florence Nightingale's nursing policy. She wanted nurses of all nations to be what she called "missionaries of health" by training others and raising the standard of health wherever they went.

Next year will see the centenary of Florence Nightingale's mission to the Crimea. The National Florence Nightingale Memorial Committee in the United Kingdom is seeking funds to establish permanently a fitting memorial to her noble work and inspiration. It is proposed: (1) to endow a residence for 44 nurses of all nations while undergoing advanced courses in London; and (2) to further the advance of nursing education by the award of scholarships.

Throughout the world similar national committees are raising funds for the award of scholarships to nurses. They are all part of the Florence Nightingale International Foundation, which is concerned with nursing education internationally. The successful candidates come to Britain and reside at Florence Nightingale House at 173-175, Cromwell Road, London, S.W.5, during their postgraduate training, adding an additional responsibility to the committee in this country; but this is the land of Miss Nightingale's birth and we must not fail in our duty to her memory.

We therefore appeal to everyone who appreciates her magnificent work for the nursing profession, and to everyone who has experienced the kindness of a nurse, and to everyone who wishes to express in tangible form their gratitude. Please either send a donation or write for a copy of an informative and illustrated booklet to: The Florence Nightingale Memorial Committee of Great Britain and Northern Ireland, 12, Whitehall, London, S.W.1.—I am, etc.,

London, S.W.1.

LUKE,
Chairman.

POINTS FROM LETTERS

The Human Foot

Dr. R. C. GREENBERG (Harold Hill, Essex) writes: I would submit that it is very questionable whether a pathological condition of flat foot, *per se*, exists at all ("Any Questions?" November 14, p. 1114). It is very rare indeed that a truly flat foot is ever seen in childhood, and even then if one gets the child to stand on its toes the arch is clearly formed. Consideration of the treatment of the almost non-existent syndrome of flat foot in childhood can hardly be separated from the general problem of the treatment of conditions of the feet and legs, such as pigeon toes, knock knees, bow legs, valgus ankles, and so forth. It seems, from what information is available, that we doctors carry out a great many manoeuvres for such conditions and most of them "get better"—which seems to mean the patients approach a socially acceptable norm of appearance and gait, but in fact they would get better just as soon without anything being done at all. It would seem reasonable to reserve treatment for the more gross abnormalities of form and those malfunctions which are definitely pathological and not just physiological variations of normal. The amount of time and money involved is, by the way, not inconsiderable. Luckily we can all agree on one thing: that whatever is done for a child's feet will be set at naught if those feet remain encased in unphysiological, ill-fitting shoes.

Dr. A. B. PARTRIDGE (Northampton) writes: In 1947 and 1948 I bought two pairs of war-surplus Army boots which I was told had been designed for African infantry who had never worn boots before. The soles are perfectly straight along the medial border, and a pair standing together is as broad as it is long. They are the only boots in which my toes really reach to the tip when walking steeply downhill, instead of my feet being pinched across the heads of the metatarsals. My usual tendency to ingrowing toenails ceases when wearing them. I have only one regret: that I did not buy a dozen pairs while they were available. Dr. G. G. Sherriff's comparison with the binding of women's feet in China (*Journal*, November 7, p. 1048) is a perfectly fair one. We must continue, perforce, to "bind" until manufacturers and the public realize that the straight inner border is the normal shape for the normal foot.

Cataract and Blindness

Dr. M. W. BIRD (Wells) writes: I am surprised that the observation in your annotation (*Journal*, November 7, p. 1038) on Professor Arnold Sorsby's report concerning the high incidence of cataract as a cause of blindness has not brought further comment in the *Journal*. Anyone who has anything to do with senile cataract patients knows that the reason for blindness is not mainly on account of inoperability due to age or illness but to the stubborn unwillingness of such patients to leave their home surroundings and undergo the ordeal of an operation in hospital. Surely, if these patients will not go to hospital, the ophthalmic surgeon should make an effort to go to them. I would suggest a well-planned system of domestic surgery. A team consisting of a surgeon and his assistant with a number of nurses should go out "on circuit." . . . I am sure that such a policy of domestic surgery would not be a retrograde step. With the aid of modern antibiotics, anaesthesia, and analgesia the results should be as good as, if not better than, the satisfactory percentages reported for surgery in rural India.

Insurance Against Misfortune

Mr. T. B. FITZ GERALD (Ashton-under-Lyne) writes: Would it not be a reasonable and possible arrangement for the Health Service, or individual hospitals, to insure patients against unavoidable risks, somewhat on the lines of "third party" insurance for road risks? The provision of reasonable financial help to such individuals and their families would soften the sting of misfortune, and should do much to lessen the urge to desperate or vindictive claims for damages.

Obituary

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

We record with regret the death on December 9 at the age of 55 of Mr. Wilfred Shaw, surgeon in charge of the gynaecological and obstetrical department at St. Bartholomew's Hospital.

Born at Birmingham on December 12, 1897, the son of Isaac Shaw, J.P., Wilfred Shaw was educated at King Edward's School in that city and at St. John's College, Cambridge, which he entered with an open scholarship. He continued a brilliant student career at Cambridge by winning a foundation scholarship and exhibition and Wright's prize. In 1918 he obtained a first-class in Part 1 of the Natural Sciences Tripos, graduating B.A. in 1919. He then went on to St. Bartholomew's Hospital with a Shuter scholarship, and later won the Matthews Duncan gold medal, the Lawrence research scholarship and gold medal, and the Cattlin research fellowship. After qualifying in 1921 he held house appointments at Bart's and then continued his postgraduate studies in Vienna and Dublin. He was admitted F.R.C.S. in 1923, graduated M.B. in 1924, and proceeded to the M.D. in 1928, being awarded the Raymond Horton-Smith prize for his thesis. In 1930 he received a certificate of honourable mention for his dissertation submitted for the Jacksonian prize of the Royal College of Surgeons of England. Elected F.R.C.O.G. in 1932—he was a founder member—he served on the museum committee of the College from 1939 to 1949 and on the pathology committee from 1949 to 1952.

Shaw, who saw service as a surgeon-probationer in the Navy in the 1914-18 war, was so outstanding as a house-surgeon to Sir Charles Gordon-Watson that many of his colleagues thought he would make a career in surgery. He had a remarkably wide range of knowledge, and was a sound craftsman. But his chief interest lay elsewhere, and it is probable that Dr. Herbert Williamson, then physician-accoucheur to St. Bartholomew's, influenced Shaw's decision to take up the work of which he became so distinguished an exponent, his contribution to gynaecological pathology being especially noteworthy. After holding the appointment of chief assistant in the gynaecological department at St. Bartholomew's, Shaw was elected assistant physician accoucheur, and in 1946 became surgeon in charge of the gynaecological and obstetrical department of the hospital. He was also a member of the board of governors. Among other hospitals at which he held appointments were St. Andrew's Hospital, Dollis Hill, and Brentwood Hospital. When the B.M.A. held its Centenary Meeting in 1932 Shaw was one of the honorary secretaries of the Section of Obstetrics and Gynaecology, and five years later he acted as a vice-president of the same section at the Belfast meeting.



While still a comparatively young man Shaw was appointed examiner in midwifery for both Oxford and Cambridge, and later he acted in a similar capacity for the Central Midwives Board, the London Conjoint Board, the University of London, and the Royal College of Obstetricians and Gynaecologists. His rapid rise to fame as a gynaecological surgeon never obscured his interest in physiology and research, as his many outstanding contributions to the literature of his subject made very plain. He was the author of many papers—the last one published in this *Journal* being on the subject of the Martius operation for vesicovaginal fistula—and several books. His *Textbook of Gynaecology* reached its sixth edition in 1952 and his *Textbook of Midwifery* has run to three editions.

Shaw's approach to his subject was essentially that of a scientist. He was quiet in manner and retiring in nature, yet he had an inexhaustible interest in his students and their subsequent careers, and a devotion to his own hospital that found an outlet in many ways that were deeply appreciated by those who knew him well. The tragic death of his old chief, Dr. H. Williamson, came as a great shock to him at the time, and in a sense left him with a feeling of isolation. Those who belonged to the Decennial Club of Bart's which included his year will long remember his persistent but unobtrusive efforts as one of its secretaries to keep it alive and active.

He is survived by his widow, three sons, and a daughter.

We are indebted to Dr. MALCOLM DONALDSON for the following appreciation: The death at an early age of my friend and colleague, Wilfred Shaw, is not only a great loss to all his friends but deprives gynaecology of one of its most scientifically minded members. "Wilfred," who was nearly always spoken of by his Christian name, was never more happy than when he was working in his laboratory, where he did his classical work on the histology of the ovary. This is not the time to recite a list of all the scholarships and gold medals that he was awarded, but mention must be made of his two textbooks, which are so popular that many editions have been published: he was just completing yet another edition at the time of his death. He will be mourned by his colleagues, many friends, and patients, and our heartfelt sympathy goes out to his widow and children.

J. H. writes: The untimely death of Wilfred Shaw has deprived British gynaecology of one of its best brains. Scientist, investigator, anatomist, pathologist, surgeon, and author are titles to which only one or two men in his specialty can lay claim: his versatile genius achieved them all.

Others will have chronicled the long and brilliant list of his academic awards. His best-selling *Textbook of Gynaecology* and his many famous publications in this and other journals made his name a household word not only to every student but to a wide international public. His operative sessions at Bart's were thronged with a polyglot and many-coloured audience, and here he delighted to demonstrate his latest modifications of some operation for prolapse or stress incontinence. On these occasions he invited and enjoyed criticism, and always maintained that he learned as much from his juniors as he taught them.

Essentially a shy, modest, and sensitive person, he was at his most natural when alone with one or two friends, with whom he would discuss a bewildering and fascinating range of subjects. He had a great sense of humour and never tired of pulling his own leg, as well as those of his beloved students, though nothing pleased him more than a deft repartee from his victim. His memory was remarkable, and he never forgot the name of any of the vast

number of students who passed through his hands. This uncanny gift enabled him to imprint indelibly upon his mind the published work of his specialty, so that his erudition and accuracy startled and confounded his opponent.

He knew and loved every stone and shadow in the Square at Bart's; here of a summer's afternoon he delighted to stand by the fountain and receive the greetings of all who passed that way. As we approached, his face would light up with a welcoming grimace and we would tarry a while in conversation. Having a word with Wilfred often implied more than pleasant chatter, and a few minutes of his shrewd advice and sound wisdom have resolved many a problem and helped many a career.

That a spirit so young and gay should be mortally wounded for the last two years did not daunt his matchless courage. Knowing his days numbered by a disease whose advance he observed almost weekly, he set himself the task of writing one last book. It was a race against time, but he was always a quick operator, and he has fulfilled his contract.

T. Y. FINLAY, M.D., F.R.C.P.Ed.

Dr. T. Y. Finlay, former maternity and child welfare medical officer in Edinburgh, died there on November 28 at the age of 71. Of Scottish parentage, Thomas Yule Finlay was born in Paris, where he spent his early years. When the family returned to Edinburgh he attended the Royal High School and then proceeded to the University, where he graduated M.B., Ch.B. in 1907, taking the M.D. in 1912 with a thesis on haemophilia, for which he received a high commendation. He was elected F.R.C.P.Ed. in 1927.

After graduation Finlay held resident posts at many of the hospitals in the city, where he came under the influence of such stalwarts as John Wyllie, J. W. Ballantyne, John Thomson, and Claude Ker, of whom he often spoke, and always with affection and gratitude. From 1913 till 1919 he was principal medical officer and medical superintendent of the Craiglockhart Poorhouse and Hospital, Edinburgh, where he carried out much valuable and original work among the children resident there. In 1915 he became associated with the Edinburgh Infant Health Centres Committee and acted as one of that organization's medical officers for infant welfare work.

Finlay was the unanimous choice of Edinburgh Corporation for the post of medical officer in charge of the maternity and child welfare section of the public health department when that section was brought into being in 1919. Under his wise guidance and direction and his happy knack of knitting voluntary and official activities into a co-ordinated whole, the section steadily extended its field, and the results achieved were remarkable. When he retired in 1947 well-deserved tributes were paid to his outstanding services on behalf of the mothers and young children of the city.

In 1919 he was appointed a member of the Scottish Committee on Child Life of the Medical Research Council and carried out nutritional studies on infants and young children for that body. In 1922 he was elected an assistant physician to the Edinburgh Royal Hospital for Sick Children, a post he held until 1932, when he was appointed senior assistant physician to the local municipal hospitals' children's unit. From 1939 till 1947 he was also honorary associate paediatrician at the Simpson Memorial Maternity Hospital. He was lecturer and examiner on diseases of children and child welfare at the university and at many other teaching organizations in the city. Though he may not have

published a great deal, his papers were always carefully prepared and were accurate and well expressed.

Recognition of his sterling work on the care of children came when he was elected a member of the Association Internationale de Pédiatrie Préventive in 1933, and an honorary member of the British Paediatric Association, of which he was an original member, in 1947, and of the Scottish Paediatric Society. Throughout his whole medical career in Edinburgh he was closely associated with many local voluntary organizations concerned with the care of mothers and children, and after his retirement he flung himself wholeheartedly into the work of many of these. He was one of the founders, in 1923, of a voluntary committee to promote adoption of children, and this committee had its headquarters in a room in his department. Later it became known as the Scottish Association for the Adoption of Children, and he was its honorary medical officer and, for a few years after he retired, its treasurer. He was a member of the committee appointed this year by the B.M.A. to consider the present law in relation to adoption, and his wide experience was of great value during its deliberations.

The pioneering spirit of Dr. Finlay was doubtless kindled by his brother-in-law, Gaston Variot, of Paris, one of the leaders in France of the infant welfare movement, but it was certainly set aflame by Ballantyne and Thomson, to whom he always acknowledged his deep indebtedness. He spent his whole life among children, whom he loved and to whom he gave of his best. His approach to the child, well or sick, was gentle and sympathetic, his examination thorough. Diagnosis was based essentially on the clinical findings, supplemented where necessary by laboratory and other aids. With difficulties in infant feeding he was at his best, and his management and supervision of marasmic infants were models of care and patience.

Simple in his faith, he was a keen and active member of the Church of Scotland. A staunch upholder of family life, he was supremely happy in his own family circle, and the sympathy of his colleagues and friends goes out to his widow, daughter, two sons, and grandchildren.

By the death of Dr. CHARLES HOPE WADDELL at Coseley on October 21 at the age of 74 the Black Country of South Staffordshire loses one of its outstanding practitioners. Although born in California, he spent his boyhood in Northern Ireland, and qualified in 1906 from Queen's College, Belfast, with the Irish triple licentiate. After holding a resident appointment at the Royal Victoria Hospital, Belfast, he came to England and learnt the disciplines of general practice as an assistant at Hednesford, Staffordshire. Forty years ago he entered his real life's work when he took over the practice at Coseley, an industrial village in the heart of the Black Country, and there he continued till he handed over the reins to a younger colleague two years ago—apart from a period of service with the R.A.M.C. in the war of 1914-18. A man of outstanding personality, Dr. Waddell exemplified the immense influence for good that can be wielded by a practitioner long resident in, and devoted to, his locality. Not only did he serve his patients to the utmost of his ability and with untiring energy, but he also controlled them, and his affectionate nickname of "the King of Coseley" reflected this paternal relationship, which indeed is one of the hallmarks of a good doctor. Apart from his professional work, he played a leading part in the public life of the district, serving as medical officer of Coseley for a time

and later as a councillor, and in the days of the voluntary hospitals he was the mainspring of many local activities devoted to their support. A loyal member of the British Medical Association, there was no more regular attendant at meetings, and he was chairman of the South Staffordshire Division in 1926-7, as well as being for many years a member of the local insurance committee. Dr. Waddell was a man of great though sometimes rugged integrity, whole-hearted and untiring in all he did, occupying a niche of his own in our affections, so that his death leaves those of us who knew him well with a sense of permanent loss. At the funeral service the parish church of Coseley was packed by colleagues and friends from hospital and practice and local authorities, and by his old patients, all of whom were there to pay respect to the passing of a great personality.—J. H. S.

Dr. D. R. ALLISON, consulting physician to Withington Hospital, Manchester, died suddenly on November 9 at the age of 50. David Rhodes Allison, who was a Yorkshireman, was born on November 25, 1902, and was educated at Leeds University, where he graduated M.B., Ch.B., with honours, in 1925. In the same year he obtained the London conjoint diploma, and in 1926 proceeded to the M.D. After holding the post of house-physician at the General Infirmary at Leeds he went into general practice at Filey, in Yorkshire. In 1939 he obtained the M.R.C.P. with the object of becoming a consulting physician, and shortly afterwards he left Filey on being appointed chief clinical assistant at Manchester Royal Infirmary. Early in 1942 he entered the R.A.M.C. as a lieutenant and saw service in West Africa and India. He relinquished his commission in 1945 because of ill-health, having attained the rank of lieutenant-colonel. On return to civilian life he became for a time honorary physician to the Manchester Northern Hospital and visiting physician to Oldham Royal Infirmary, and was then elected consultant physician to Stockport and Withington Hospitals, and, more recently, to Stepping Hill Hospital, Stockport. Because of his ability, integrity, and warm personality he soon built up an extensive consulting practice. He was especially interested in cardiology and in the psychiatric aspects of medical conditions, and was the co-author with the late Dr. R. G. Gordon of a book entitled *The Uses and Limitations of Psychotherapy*. In 1950 his paper on pain in the chest wall simulating heart disease was printed in this *Journal*. His fatal illness was sudden and quite unexpected, for right up to the day of his death he was apparently in good health and the full vigour of life. He will be remembered by his friends as a kind and loyal colleague who would take infinite pains to help, and by his many patients as a good and kindly doctor of outstanding ability and integrity. He leaves a widow, a daughter, and a son, who is also a doctor.—E. H. K.

Dr. F. W. JOHNSON died at his home at Bawtry, near Doncaster, on November 17, at the age of 77. The son of the late Dr. W. J. Johnson, Frederick William Johnson was born at Tickhill, Yorkshire, on October 14, 1876, and was educated at King Edward VI School, Retford, and at the Yorkshire College, Leeds, then a constituent college of the Victoria University of Manchester, where he graduated M.B., Ch.B. in 1899. After working as house-surgeon to Mr. Berkeley (later Lord) Moynihan at the General Infirmary at Leeds he went to South Africa to serve as a civil surgeon in the South African war, but was invalided home in 1901 after an attack of enteric fever. He then joined his father in practice at Bawtry. Always an enthusiastic member of the volunteer movement, he had remained attached to the Sherwood Foresters after his return from South Africa, and on the outbreak of war in Europe in 1914 he went to France with the R.A.M.C. From 1917 to 1919 he commanded a field ambulance, and was demobilized with the rank of lieutenant-colonel. In the last war he joined the Home Guard as medical officer to the South Yorkshire sub-area, with the rank of lieutenant-colonel. An active member of the British Medical Association for some 40 years, Dr. Johnson was chairman of the Doncaster Division from 1929 to 1936, and he was a former president of the Doncaster Medical Society.

It was very seldom that he allowed anything to interfere with his attendance at meetings. He had the cheerful ruddy complexion of the countryman, a figure which always conveyed the hint of a military training, and the shrewdness and sagacity of the very best type of general practitioner. Many of his colleagues had the privilege of serving under his chairmanship of the Ministry of Labour and National Service board at Doncaster from 1939 to 1952, and were always impressed by his rapid and accurate clinical assessments: few men can ever have made fewer mistakes. A devoted churchman, he was for many years a churchwarden at Bawtry. In his early days he enjoyed playing football and cricket, and throughout his life he was a keen naturalist and gardener. The B.M.A. has lost a staunch supporter, general practice a wise, unassuming, and sterling character, and his colleagues a loyal friend. He leaves a widow, one son, Dr. F. H. W. Johnson, who carries on the practice, and three daughters.—R. W. L. W.

Dr. CAROLINE WALKER, who died suddenly on November 26, was one of those who helped pioneer the way for women to be doctors, and one of the oldest medically qualified women in the West of England. She was the trusted friend of many. Theodosia Caroline Green was born in January, 1872, one of the eleven children of the Reverend John H. B. Green, rector of Normanton-le-Heath, Leicestershire. From school days she was always one who was prepared to plough a new, and at times an unconventional, furrow. At school she studied geology on her own, as there was no one to teach it. When she decided to study medicine she again found difficulties in her way, and had to study in various places, first in London at the London School of Medicine for Women (now the Royal Free Hospital) and later at the Rotunda Hospital, Dublin, where she obtained a licence in midwifery in 1895. Later in the same year she took the Scottish triple qualification, and then went on to Brussels, where she graduated M.D. in 1896. After qualification she took a post as junior assistant medical officer at the Lincolnshire County Asylum, an event which evoked a newspaper headline, "Woman Doctor Comes to Lincoln." In 1900 Caroline Green married Mr. Cyril H. Walker, then an ophthalmic surgeon practising in Bristol. For the next 30 years, especially during the first world war, she busied herself with infant welfare work, and acted as medical officer at several clinics in Bristol. For some years she lectured in hygiene in the department of education of Bristol University. She became well known, not so much for academic achievement or clinical skill as for her very sound advice, which was often sought and freely given on a wide range of subjects related to medicine. She was the much respected member of many committees, some medical and some connected with social welfare. Most of all, perhaps, her wise and balanced advice was valued during the 15 years that she was chairman of Walker Dunbar Hospital Committee. However, it was not only hospitals and welfare organizations which received her help: her friendly counsel was sought by many, particularly young women doctors, in whom to the end of her life she had a special interest. After an accident in 1938 she became a partial invalid, but in spite of increasing pain and disability from arthritis she remained resolutely cheerful, her courage and fortitude encouraging many in similar circumstances. Her generosity, sense of humour, and high Christian principles brightened every part of her life and work, whether for medicine or for her local church. We offer our deepest sympathy to her husband and to their two sons, one a doctor, and three daughters. One grandson is also a member of the medical profession.—D. H. T.

Professor HANS ISELIN, the eminent Swiss surgeon, died at Lörrach, Baden, on November 22, at the age of 75. He was born on February 21, 1878. His family were well known in Basle, and on his mother's side he was a descendant of Hans Holbein the younger. He studied medicine at Geneva and Kiel, graduating in 1902, and then joined the staff of the medical faculty at Basle University and later became chief of the surgical polyclinic in that city. He was

also surgeon to St. Clara-Spital and to St. Elisabeth Hospital, Lörrach, Baden. In 1918 he was given a professorial chair at Basle to develop the teaching of traumatic surgery, and he served for a time as dean of the medical school. Iselin was a pioneer in the use of radiotherapy in surgical tuberculosis and in the post-operative treatment of cancer of the breast. He made notable investigations on growth disturbances in rats after parathyroidectomy and published many papers on fractures and dislocations, bone and joint diseases, and traumatic surgery. He remained in active practice to the end of his life and was operating at the hospital in Lörrach on the day before he died.

Medico-Legal

CHOKED BY FAULTY MAGILL TUBE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

At an inquiry held recently by the Sheriff-Substitute of Lanarkshire into the death of Miss Margaret Elliott, aged 32, in the Southern General Hospital, Glasgow, death was found to be due to a defect in the Magill tube used for the administration of a general anaesthetic which had never previously been known to the consultant anaesthetist, Dr. J. R. Gallie.

Miss Elliott was suffering from a recurrence of symptoms of cervical rib which had previously been much improved by operation, and was admitted to hospital for further operation to relieve pressure on the nerves running down from the neck to the left arm. Anaesthesia was induced by thiopentone, nitrous oxide, and oxygen, and 1.5 ml. "scoline" intravenously, and the assistant anaesthetist, after inflating the patient's lungs with oxygen, passed a cuffed Magill's endotracheal tube connected to a semi-closed anaesthetic apparatus. The tube was visually inspected on removal from the sterile drum in which it was stored, and the cuff on test inflation with the standard 10 ml. of air appeared to be in good condition. It had probably been used only once before. A throat pack was inserted round the tube to keep it in position, and anaesthesia was maintained with nitrous oxide, oxygen, and "trilene."

After some thirty minutes the anaesthetist noticed a sudden diminution in the volume of tidal air indicating obstruction of the airway. He deflated the cuff of the Magill tube, which caused the obstruction to disappear, and called the surgeon's attention to the obstruction. The operation was suspended, and cardiac massage restored the pulse, which had stopped. Voluntary respiration, which had also stopped, was re-established within a few minutes, but although the patient survived for eleven days her condition gradually deteriorated and consciousness never returned.

Section of the brain on necropsy showed mottled pink degenerative changes of the cortex and basal nuclei, and Dr. W. P. Weir, pathologist to the Royal Alexandra Infirmary, Paisley, concluded that death was due to anoxaemia of the brain following cessation of respiration and circulation during the general anaesthesia for the operation.

When the Magill tube was examined after the operation it was found that the rubber of the cuff was perished and that when the cuff was inflated the perished rubber blew up into a soft blister or bulb. Dr. Weir thought that this must have slid down the trachea and either pressed the open end of the tube against the side of the trachea and so blocked it, or else must itself have covered and blocked the end of the tube. A movement of the tube during the operation would have been sufficient to move the blister in this way. The tube had been kept after sterilization in the autoclave in the recognized way, and the only cause suggested for the deterioration in the rubber of the cuff was that a drop of ether or trilene, both of which are rubber solvents, might have got on it. This would explain why the defect was not shown by the test inflation of the cuff before the tube was used. Dr. Gallie in his evidence at the inquiry said that it was the first time that he had ever seen a rubber cuff fail in this way.

Medical Notes in Parliament

Fluoridation Experiments

Mr. IAIN MACLEOD, Minister of Health, informed Mr. C. R. HOBSON on December 10 that before fluoride was added to the water supplies of selected communities baseline information on the incidence of dental caries in those communities would be obtained and any comparable communities that could be used as controls. Other matters receiving consideration included whether a survey of fluoride excretion in the urine of representative children and adults of all age groups throughout the country should be made in order to assess the required dose of fluoride to be added to water supplies; how adequate supplies of fluorides in the most suitable form will be obtained; and what safeguards there will be against errors in dosage and undue exposure of the operating personnel to the materials handled.

Vaccination Deaths

Mr. S. P. VIANI asked the Minister of Health, in regard to the age group 0-5 for each of the years 1938 to the latest date available, how many death certificates were received on which the words vaccination, vaccinia, post-vaccinal encephalitis, or any other association with vaccination appeared, and how many of these deaths were assigned to vaccinia, generalized vaccinia following vaccination, post-vaccinal encephalitis, or other complications of smallpox vaccination. Mr. IAIN MACLEOD on December 8 gave him the following details:

Year	Death Certificates with mention of Vaccinia, etc.	Deaths Assigned to Vaccinia, etc.
1938	6	5
1939	1	1
1940	7	6
1941	4	4
1942	5	3
1943	4	4
1944	9	8
1945	6	5
1946	3	1
1947	10	6
1948	6	4
1949	1	1
1950	—	—
1951	6	4
1952	3*	3*

*Includes one infant who had not herself been vaccinated.

Health in British Guiana

Mr. RONALD RUSSELL asked the Secretary of State for the Colonies what improvement had been achieved in the health of the people of British Guiana in recent years. Mr. LYTTLETON stated on December 8 that, of the major communicable diseases in British Guiana, malaria had decreased substantially from 15,490 notified cases and 290 deaths in 1947 to 181 cases and 28 deaths in 1952. There had also been a decline in the number of notified cases of enteric fever and pulmonary tuberculosis. Other detailed improvements were too complex to summarize, but over the past eight years the infant mortality rate had fallen from 101 per thousand live births to 82, and over approximately the same period the expectation of life at birth had increased by four years.

Welfare Foods

Major G. LLOYD-GEORGE, Minister of Food, who was asked what he was doing to encourage the consumption of welfare foods, replied on December 7 that he welcomed the opportunity of assuring the House that by all the means at his disposal the Ministry continued to emphasize the importance of welfare foods. Mr. SOMERVILLE HASTINGS asked him to state in a few words how he was going to encourage an increased consumption of welfare foods. Major LLOYD-GEORGE said that many methods had been used for a considerable time—posters, talks, and full information to

expectant mothers. Every possible method was still being used, and the percentage of take-up of the various welfare foods remained much the same and had sometimes increased.

Student Nurses' Call-up

Mr. R. J. MELLISH asked the Minister of Labour on December 8 whether he proposed to exempt from national service all those employed as student nurses in mental hospitals, in view of the shortage of mental hospital staff. Mr. HAROLD WATKINSON, the Parliamentary Secretary, replied "No," but the call-up of such students could be deferred until they had completed their training.

Rejections

The numbers of men called up for national service, and the numbers rejected on medical grounds, in the past five years, it was stated by the Parliamentary Secretary, Ministry of Labour, on December 1, have been: 1948—150,900 (rejected, 27,750); 1949—166,600 (rejected, 36,370); 1950—174,200 (rejected, 47,314); 1951—168,651 (rejected, 43,856); 1952—170,384 (rejected, 42,829).

Hospital Service Reserve

Mr. IAIN MACLEOD, Minister of Health, announced on December 3 that the Queen had been graciously pleased to assume the title of Head of the National Hospital Service Reserve in the United Kingdom, thus extending to that Reserve the honour already conferred upon the Civil Defence Corps.

Universities and Colleges

UNIVERSITY OF OXFORD

The Theodore Williams Scholarship in Physiology has been awarded to Roger James Robinson, scholar of Balliol College, and Kenneth Bryson Roberts (Lincoln College) has been re-elected to the Philip Walker Studentship in Pathology for two years from October 1, 1953.

UNIVERSITY OF CAMBRIDGE

Dr. B. H. G. Hayward has been elected into a second John Lucas Walker Studentship for one year from June 1, 1952, and into the same studentship for two years from June 1, 1953.

In Congregation on October 17 the degrees of M.B., B.Chir. were conferred on G. G. K. Parsons.

UNIVERSITY OF ST. ANDREWS

At a Graduation Ceremony held on October 9 the degree of M.D. (with commendation) was conferred upon J. A. Gillespie.

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN CLINICAL PATHOLOGY.—P. B. Adamson, J. D. Arneaud, L. R. Chapman, S. K. Chopra, B. R. Davis, N. U. C. Godfrey, W. F. Hunter, S. Jatinandana, N. C. March, Mary Ralston, W. A. Russell, M. P. K. Shoorbridge, J. C. Squires.

EXTERNAL DIPLOMA IN CLINICAL PATHOLOGY.—M. C. Berenbaum, M. Datta, H. J. Woodliff.

The following candidates at the London School of Hygiene and Tropical Medicine have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PUBLIC HEALTH.—P. P. M. Browne, J. Clearkin, K. A. Rahman, J. T. Subramaniam, D. R. Thomson, D. Ungar.

ACADEMIC POSTGRADUATE DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—P. Sirivorasarn.

UNIVERSITY OF WALES

The Council of the Welsh National School of Medicine has appointed Cecil Wilfred Dickens Lewis, M.Ch., F.R.C.S., who is at present Lecturer in Surgery, to be Senior Lecturer in Surgery at the School.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending November 28 (No. 47) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire	Eire	Eng. & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria ..	16	2	12	0	2	41	4	13	0	1
Dysentery ..	399	64	159	5	1	158	29	57	0	0
Encephalitis, acute	1	0	1	0		3	0	0	0	1
Enteric fever:										
Typhoid ..	2	0	0	0		3	0	0	2	1
Paratyphoid ..	3	0	0	0		8	1	0	0	0
Food-poisoning ..	121	12		0		77	17		0	
Infective enteritis or diarrhoea under 2 years ..					25	17				6
Measles*	875	20	31	12	74	12,130	1,129	174	24	178
Meningococcal infection ..	32	4	13	4	2	28	1	16	0	3
Ophthalmia neonatorum ..	26	3	7	0		35	2	10	0	
Pneumonia†	557	36	156	9	1	519	46	341	3	
Poliomyelitis, acute:										
Paralytic ..	50	4				62	3		1	2
Non-paralytic ..	27	3				21	2		6	
Puerperal fever‡	211	48	20	3	1	227	36	11	3	1
Scarlet fever ..	1,484	75	286	48	59	2,226	188	370	38	83
Tuberculosis:										
Respiratory ..			157	20			134	31		
Non-respiratory ..			19	4			36	12		
Whooping-cough ..	2,608	114	366	50	49	1,854	108	97	36	96

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land.	Scot.	N. Ire	Eire	Eng. & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0	1	0		0	0	0	0	0
Encephalitis, acute ..	0				1	0				0
Enteric fever ..	0	0	0	0		0	0			0
Infective enteritis or diarrhoea under 2 years ..	7	0	3	0	1	7	0	2	0	0
Influenza ..	6	1	1	0	0	11	1		0	1
Measles ..	0	0	0	0		0			0	0
Meningococcal infection ..	0	0				1				
Pneumonia ..	236	45	20	4	2	190	31		9	6
Poliomyelitis, acute	0	0				5	0			0
Scarlet fever ..	1	0	0	0		0			0	0
Tuberculosis:										
Respiratory ..	104	13	16	0	4	133	18	15	4	2
Non-respiratory ..	0	0	3	0	0	0	2		0	0
Whooping-cough ..	2	0	0	0	0	1	0		0	0
Deaths 0-1 year ..	194	25	23	2	11	206	18	33	10	11
Deaths (excluding stillbirths) ..	5,036	790	541	95	141	5,302	753	569	112	137
LIVE BIRTHS ..	6,802	1,022	782	202	389	6,701	955	715	207	323
STILLBIRTHS ..	175	19	18			183	17	20		

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

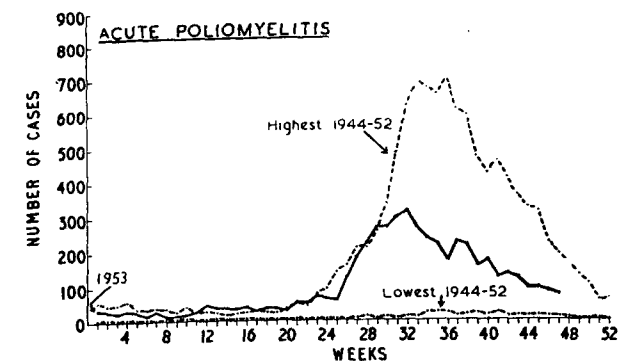
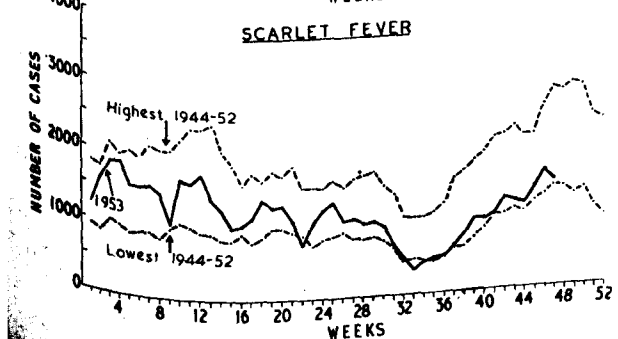
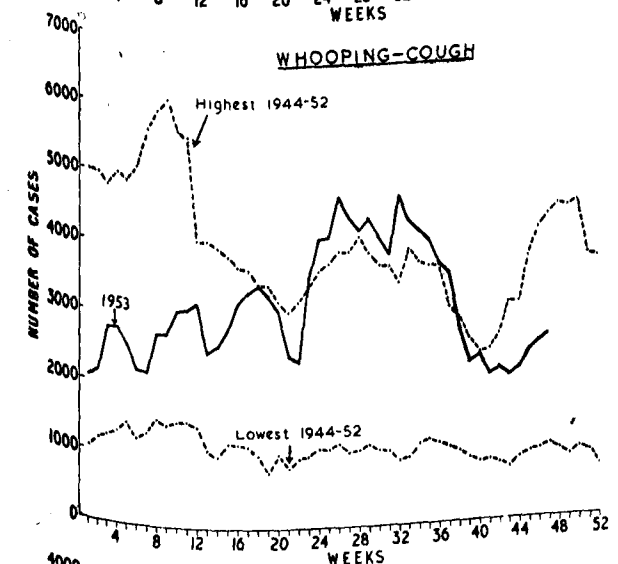
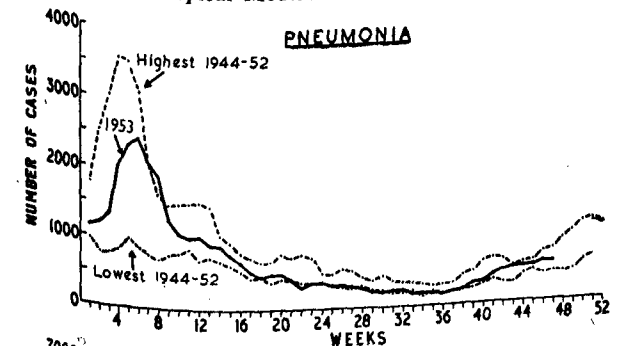
Vital Statistics

Northern Ireland—Second Quarter

According to the Registrar-General's return of vital statistics for the quarter ending June 30 the birth rate was 22.9 per 1,000 population, an increase of 0.7 over the rate for the same period of 1952. The general death rate was at 10.8 per 1,000 of the population as compared with 10.7 for the corresponding period of 1952, but it is 0.4 below the average rate for the second quarters of the previous five years. The infant mortality rate of 37 per 1,000 live births was the lowest ever recorded for the June quarter, as was the death rate from tuberculosis (0.22 per 1,000 population).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

An increase of 98 in the number of notifications of whooping-cough, from 2,510 to 2,608, and 82 for measles, from 793 to 875, and a decrease of 129 for scarlet fever, from 1,613 to 1,484, were reported in England and Wales during the week ending November 28.

The largest variations in the trends of whooping-cough were a decrease of 49 in the number of notifications in Lancashire, from 276 to 227, and a rise of 33 in Essex, from 153 to 186. The largest rises in the incidence of measles were 59 in Norfolk, from 16 to 75, due to an outbreak of 65 cases in Norwich C.B., and 32 in Southampton County, from 6 to 38, due to an outbreak in Southampton C.B. with 21 notifications. The only large variation in the trends of scarlet fever was a fall of 32 in Middlesex, from 84 to 52. 16 cases of diphtheria were notified, 12 fewer than in the preceding week. The chief feature of the returns was a fall in Birmingham C.B. from 7 to 3. 5 cases were notified in Staffordshire. In Scotland 12 cases of diphtheria were notified; of these 9 were reported from Glasgow.

During the week 77 cases of acute poliomyelitis were notified. These were 4 fewer for paralytic and 7 fewer for non-paralytic cases than in the preceding week. The largest returns were Somersetshire 12 (Wincanton R.D. 7), Lancashire 8, London 7, Dorsetshire 6 (Poole M.B. 3, Wimborne and Cranborne R.D. 3), Staffordshire 5, Warwickshire 5, and Yorkshire West Riding 5.

399 cases of dysentery were notified, being 37 more than in the previous week. The largest centres of infection were Yorkshire West Riding 73 (Bradford C.B. 45), London 64 (Islington 12, Southwark 17), Lancashire 52 (Manchester C.B. 15, Bolton C.B. 14), Norfolk 42 (Norwich C.B. 42), Essex 35 (Braintree R.D. 14, Colchester M.B. 11), and Middlesex 34 (Willesden M.B. 34).

Week Ending December 5

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,549, whooping-cough 2,595, diphtheria 13, measles 886, dysentery 445, acute poliomyelitis 65, paratyphoid fever 1, and typhoid fever 3.

The Services

A Supplement to the London Gazette has announced the following awards:

Second Clasp to the Army Emergency Reserve Decoration.—Major W. H. Valentine, O.B.E., R.A.M.C.

First Clasp to the Army Emergency Reserve Decoration.—Major (Honorary Lieutenant-Colonel) A. W. Davidson, M.C., and Major R. L. Sadler (retired).

Army Emergency Reserve Decoration.—Major C. M. Fraser (retired).

The names of Captains E. D. Mackie and C. L. Tutty, R.A.M.C., appear in a list of those mentioned in dispatches in recognition of gallant and distinguished services in Korea during the period July 1 to 27, 1953.

Medical News

Nuffield College of Surgical Sciences.—At a meeting of the council of the Royal College of Surgeons on December 10 it was decided to proceed at once with the building of the Nuffield College of Surgical Sciences. It is almost exactly five years since the announcement of Lord Nuffield's magnificent gift of £250,000 for the purpose of building a residential college where young surgeons, particularly from overseas, could live while undertaking advanced study or research. The new college will adjoin the present premises of the Royal College of Surgeons, on its east side. A drawing of it was printed in our issue of July 2, 1949 (p. 27).

Dope-peddling in Britain.—The extent of the illicit traffic in narcotic drugs in Britain is much less than reports in the lay press might suggest. According to the United Kingdom's annual report to the United Nations on the subject, last year there was no evidence of any regular or organized traffic in Britain. Hemp and opium remained the drugs most frequently encountered by the police; of the 87 persons convicted of having hemp 67 were of African, Indian, or West Indian origin, while all except three of the 60 convictions relating to opium concerned Chinese, most of them in Liverpool. It is clear that regular "doping" by adolescents is not the problem here that it is in New York. The case of an 18-year-old plumber's mate, if the statements made in court were true, is said to be the "first recorded instance in the United Kingdom of an adolescent regularly smoking hemp." The report states that 297 addicts were receiving drugs from medical sources in 1952. In the non-professional classes women addicts outnumbered the men by nearly two to one, but among 75 addicts from the professional classes (72 doctors, 2 dentists, and one pharmacist) only three were women.

Buckston Browne Prize Essay.—The Council of the Harveian Society of London has selected "The Medical Problems of the Overweight Patient" as the subject for the Buckston Browne Prize essay. The prize, which consists of a medal and £100, is open to any member of the medical profession registered in the British Isles or Dominions and is limited to candidates under 45 years of age. Essays must be sent in by December 1, 1954. Further particulars may be obtained from the hon. secretaries, Harveian Society of London, 11, Chandos Street, Cavendish Square, London, W.1.

Scientific Exhibition, Glasgow, 1954.—Those proposing to exhibit at the B.M.A. Annual Meeting in 1954 should apply as soon as possible. In view of the joint meeting with the Canadian Medical Association in Toronto in 1955 there will be no other B.M.A. Scientific Exhibition in this country until 1956. Full details and application forms are obtainable from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

102 Not Out.—At the Whittington Hospital, London, on December 5 an operation was performed to repair a fractured femur in an old lady of 102. The next day this remarkable patient was up for 20 minutes, and the latest news is that nine days after her operation she is up for three hours each day.

Dangerous Drugs Act, 1951.—By an Order under this Act, which came into force on December 14, the salts of N-allylnormorphine and any preparation containing this substance have been brought within the provisions of Part III of the Act.

David Anderson-Berry Prize.—On December 4 the president of the Royal Society of Edinburgh, Professor James Kendall, F.R.S., announced the award of the David Anderson-Berry Prize to Dr. John Read, of the Dunedin Medical School, New Zealand, for his work on the relationship between oxygen tension and the effect of x rays on the tissues.

Council of the Royal Society.—In addition to the president, Dr. E. D. Adrian, the following members of the medical profession are among those who have been elected to the council of the Royal Society: Professor E. G. T. Liddell, Professor R. A. McCance, and Sir Edward Mellanby.

British Association of Otolaryngologists.—The following have been elected officers for 1953-4:—*president*: Mr. V. E. Negus; *immediate past president*: Mr. H. V. Forster; *vice-president*: Mr. I. Simson Hall; *honorary secretary*: Mr. Myles L. Formby; and *honorary treasurer*: Mr. W. A. Mill.

Medical Golfing Society.—At the annual general meeting Mr. George Armitage was elected president and Brigadier H. L. Glyn Hughes captain for the coming year.

London Medical Orchestra.—The Orchestra is now holding rehearsals on Thursdays at 7.45 p.m. at the George Eliot School, Marlborough Hill, London, N.W.8. More playing members are wanted, and should apply to the secretary, Dr. E. V. Slaughter, 6, Oxford Court, Queens Drive, London, W.3.

COMING EVENTS

A Seminar on Foot Health will be held by the Central Council for Health Education at St. John House, Collingham Gardens, London, S.W.5, from February 23 to 27, 1954. The programme will include a lecture on "Foot Function" by Mr. T. T. Stamm, films and discussions, and visits to London shoe factories.

The Ophthalmological Society.—The annual congress will be held at Durham University from April 22 to 24, 1954. The main subject for discussion will be "Inflammatory Vascular Diseases Affecting the Eyes." There will also be short symposia on "Cyclodiathermy," "Changes in the Incidence of the Eye Affections of Coal Miners in the Past 25 Years," and "Gonioscopy."

British Association of Physical Medicine.—The annual meeting will be held at King's College Hospital, London, S.E.5, on April 30 and May 1, 1954. Further information may be obtained from the honorary secretary, 45, Lincoln's Inn Fields, London, W.C.2.

Association of Surgeons of Great Britain and Ireland.—The annual meeting will be held in Leeds from May 13 to 15, 1954. The subjects to be discussed include: "Hiatus Hernia," "Ulcerative Colitis," "Exophthalmos," and "Duodenal Diverticula." Further information may be obtained from the honorary secretary of the association, 45, Lincoln's Inn Fields, London, W.C.2.

The South African Medical Congress will take place in Port Elizabeth from June 21 to 26, 1954. Part of the programme is expected to take the form of a symposium on rehabilitation. Those who would like to contribute papers at the Congress are asked to communicate as soon as possible with M. G. Woolf, Organizing Secretary, P.O. Box 1137, Port Elizabeth, South Africa.

International Association of Gerontology.—The third congress of the association will be held in London from July 19 to 23, 1954. Further information may be obtained from the organizing Secretary, Mrs. A. Humpage, B.M.A. House South, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, December 21
ROYAL EYE HOSPITAL.—5 p.m., Dr. T. H. Whittington: *Convergence, Heterophoria, and Factors Affecting Binocular Vision.*

Tuesday, December 22
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Mr. A. K. Monro: *Hypostatic Eczema and Ulceration.*

APPOINTMENTS

ANDERSON, T., M.B., Ch.B., D.P.H., County Medical Officer of Health and Principal School Medical Officer, Oxfordshire.
BODMAN, R. I., M.B., Ch.B., D.A., Anaesthetist (Consultant Grade), St. Peter's, St. Paul's, and St. Philip's Hospitals, London.
BROWN, H. MORROW, M.D., M.R.C.P.Ed., Consultant Chest Physician, South Derbyshire Area.
DONALDSON, RAYMOND JOSEPH, M.B., B.Ch., D.P.H., Deputy Medical Officer of Health for the City of Stoke-on-Trent.
ESSEX-CATER, A. J., M.R.C.S., L.R.C.P., D.P.H., D.C.H., F.R.A.I., Deputy Medical Officer of Health, Swansea County Borough.
EVANS, W. G., M.B., B.Chir., D.P.H., Medical Officer of Health for Scarborough Borough, Scarborough Rural District, and Scabby Urban District; Assistant County Medical Officer, North Riding County Council; and Divisional School Medical Officer.
GIBSON, J. BAIRD, M.B., Ch.B., D.A., Consultant Anaesthetist, Alnwick and Wansbeck, Hospital Management Committee.
HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—R. N. Twistington Higgins, M.B., B.Chir., Part-time Registrar to the Department of Psychological Medicine; S. M. Singh, M.B., B.S., House-surgeon to Orthopaedic and Plastic Departments; C. H. MacD. Walker, M.D., M.R.C.P.Ed., D.C.H., Senior Medical Registrar to Thoracic Unit; E. D. R. Campbell, B.M., B.Ch., Part-time Registrar to Department of Physical Medicine; Teresa M. Coyle, M.B., B.Ch., D.O., Part-time Senior Registrar to Ophthalmic Department; A. L. Jeanes, M.B., B.Chir., M.R.C.P., D.C.H.; I. S. Wallman, M.B., B.S., M.R.A.C.P., and Joan Angus, M.B., Ch.B., M.R.C.P., House-physicians; A. F. Ferguson, M.B., Ch.B., F.R.C.S., and Anne M. Calder, M.B., Ch.B., F.R.C.S.Ed., House-surgeons; Mary F. Thomson, M.B., Ch.B., Assistant Resident Medical Officer, Tadworth.
LIVERPOOL REGIONAL HOSPITAL BOARD.—R. B. Taylor, M.R.C.S., L.R.C.P., D.P.M., Whole-time Consultant Psychiatrist to Rainhill Hospital; T. P. Smith, M.R.C.S., L.R.C.P., D.P.M., Assistant Psychiatrist to Ormskirk and Southport areas; F. G. Anderson, M.B., Ch.B., D.M.R.D., Assistant Radiologist to Aintree and Walton Hospitals; Lucy M. B. Nelson, M.B., B.S., M.R.C.P., Assistant Chest Physician.
MANCHESTER REGIONAL HOSPITAL BOARD.—Betty Hargreaves, M.B., Ch.B., M.R.C.O.G., Consultant Obstetrician and Gynaecologist, Wigan and Leigh Hospital Centre; J. D. Glynn, L.R.C.P.&S.I., D.P.M., Assistant Psychiatrist, Whittingham Hospital.
MASON, S. JOAN, M.B., B.Ch., D.O.M.S., Assistant Ophthalmic Surgeon for Newport and East Monmouthshire, North Monmouthshire and Rhymney and Sirhowy Valleys Hospital Management Committee.
MILNE, JOHN COURTIS, M.B., Ch.B., D.P.H., D.T.M.&H., Assistant County Medical Officer and District Medical Officer of Health for Wells Urban District Council and Docking and Walsingham Rural District Councils, Norfolk.
MOORHOUSE, DOREEN, M.B., Ch.B., Resident Medical Officer, the General Infirmary at Leeds.
NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—W. W. Bridgen, M.D., F.R.C.P., Consultant Senior Cardiologist, Special Unit for Research into Juvenile Rheumatism, at Canadian Red Cross Memorial Hospital, Herta Graz, M.D., D.P.M., Consultant Child Psychiatrist at Portman Clinic.
R. W. Rowan, M.D., M.R.C.P., Assistant Chest Physician, (S.H.M.O.), Edgware, Ealing and Harrow Chest Clinics. R. D. Young, M.B., Ch.B., M.R.C.P.Ed., Assistant Chest Physician (S.H.M.O.), Bedford Chest Clinic.
SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—L. V. Martin, M.B., B.S., D.A., Consultant Anaesthetist in North Gloucestershire Clinical Area; S. Muscat, M.D., D.Obst.R.C.O.G., Registrar in Obstetrics and Gynaecology to Bath Group of Hospitals; D. R. Richard, B.M., B.Ch., Surgical Registrar at Weston-super-Mare General Hospital; E. J. Sanders, M.B., Ch.B., Surgical Registrar at Cheltenham General Hospital; C. D. R. Pengelly, M.B., Ch.B., M.R.C.P.Ed., Senior Medical Registrar to West Cornwall Clinical Area.
ZWIRBACH, E., M.D., F.R.C.S., D.L.O., Consultant Ear, Nose, and Throat Surgeon, West Middlesex Hospital.

BIRTHS, MARRIAGES, AND DEATHS

DEATHS
Ashby.—On December 1, 1953, at the Mercy Home, Cork, William Joseph Ashby, M.D., of Ashgates, Hettfield Park, Cork, Eire.
Burt.—On December 1, 1953, at Pinderfields Hospital, Wakefield, Hutchison Burt, M.B., Ch.B., D.P.M., of Greenbank, Bar Lane, Wakefield, Yorks, aged 49.
Campbell.—On December 8, 1953, at the Windmill House, Ramsey, Essex, Samuel Marcus Dill Campbell, M.B., Ch.B., aged 77.
Cochrane.—On December 7, 1953, at home, Pinner, Middlesex, Thomas Cochrane, M.B., C.M., late of Peking, China, aged 87.
Greenwood.—On December 1, 1953, at his home, Birch House, Droydsden Road, Newton Heath, Manchester, Archer Greenwood, M.B., Ch.B.
Schofield.—On December 1, 1953, at Vine Cottage, Guildford, Surrey, Arthur Reginald Schofield, M.B., Surgeon Rear-Admiral, R.N., retired.
Sutton.—On November 27, 1953, at The Old Cottage, Long Melford, Suffolk, William Henry Arthur Douglas Sutton, O.B.E., L.R.C.P.&S.Ed., L.R.F.P.S., Colonel, late R.A.M.C., retired, aged 63.
Walker.—On November 29, 1953, Arthur Samuel Walker, M.D., D.P.H., of Middlesbrough, Yorks.
Warwick.—On December 4, 1953, in a nursing-home, Oxford, James Warwick, O.B.E., M.D., of Pull Croft, Sutton Courtenay, Berks, formerly of Chapel Allerton, Leeds, Yorks, aged 74.
Williams.—On November 27, 1953, in a nursing-home, Kirkby Lonsdale, Westmorland, Richard Geoffrey Williams, M.R.C.S., L.R.C.P., J.P., of Burrow, Camforth, Lancs, aged 77.
Wilson.—On December 1, 1953, at Moorcroft, West Moors, Dorset, Arthur Harold Wilson, L.R.C.P.&S.Ed., L.R.F.P.S., D.P.H., formerly of East Wills, aged 70.

Any Questions?

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

Telling about Adoption

Q.—What is the right age to tell a child that he has been adopted? How should it be done? How should the matter be broached if the telling has been delayed, for instance until the child is 10 or 12 years old?

A.—The essential requirement is that at no time in the life of the child should there have been concealment of the fact of his adoption, or any untruth told about it. If this is observed, he will have become aware of the fact, without any surprise or shock, at the earliest age when the information would have any meaning for him. At some time he will have asked whether Aunt Jane is Mother's sister, or have made some similar inquiry, when, as part of an explanation that Aunt Jane is a courtesy aunt, he can be told of his adoption. In the same way, when questions are asked about how children are born, he could be told that Mother and the mother who bore him are different persons.

If the child has reached the age of 10 or 12 without being told, then the sooner he is told the better, with the minimum of fuss, though some formality will now scarcely be avoidable. A frank confession, with the statement that it was thought best to keep the truth from him till now, seems called for.

Persistent Laryngitis and Tracheitis

Q.—What is the best treatment for persistent laryngitis and tracheitis?

A.—First of all it must be clearly established by mirror laryngoscopy that there is no growth or paralysis of the larynx to account for the symptoms. When these causes have been excluded it is advisable to inquire into the state of the upper and lower respiratory tracts, as acute or chronic disease in the sinuses or lungs can perpetuate laryngitis or tracheitis.

Though tobacco rarely by itself causes irritation or infection of the respiratory tract, it can and does aggravate any inflammation of the mucosa lining the respiratory tract. Therefore, in any stubborn case of laryngitis and tracheitis it will be necessary to abandon tobacco. Avoidance of dusty, smoke-laden, or stuffy and over-heated atmospheres is also advisable. Local treatment can include any simple antiseptic throat, lozenges in which may be incorporated a local analgesic such as benzocaine. The troublesome night cough can often be allayed by a hot drink, and inhalation of steam with Friar's balsam just before retiring may prevent it. In more stubborn cases a course of inhalations with a vaporizing attachment on an oxygen cylinder may be tried.

Inverted Nipples

Q.—What is the best treatment for inverted nipples? Is the local inunction of oestrogen ointment effective?

A.—Oestrogen ointment tends to develop the nipple and to make it more supple, and might help in the treatment of inverted nipples. In addition, however, during the second half of pregnancy some mechanical treatment is necessary, and this may take the form of daily digital manipulation or of periodic suction by an electric pump. One of the best lines of treatment, with or without the above measures, is to instruct the patient to wear "Waller"-type glass or plastic nipple-shields regularly.

Facial Disfigurement after Dental Extractions

Q.—What measures can be taken to avoid the development of the disfiguring vertical grooves in the skin of the lips which appear a few years after dental extractions? They are particularly noticeable in middle-aged women and usually get progressively worse. Cannot dentures be built to avoid this, or will wearing them at night help? Alternatively, can established furrows be removed either by surgery or other means?

A.—A deepening of the naso-labial fold invariably follows the extraction of all the teeth, the loss of the upper canines being the main cause. The effect can be minimized by the construction and wearing of "immediate dentures" and the continuous use of well-fitting plates: rarely can a denture be worn for more than a few years without requiring some alteration if the soft tissues are to remain fully supported. The dentures should be worn continuously, only being removed for cleaning.

Established furrows cannot be eliminated by prosthetic means, though much can be done to minimize them by judicious plumping of well-fitting dentures. For complete removal a plastic surgeon should be consulted.

Rectal Ether for Asthma

Q.—Can you give me full instructions on the administration of rectal ether in oil for asthma? When is it indicated?

A.—The usual dose is 5 to 7 oz. (140 to 200 ml.) of equal parts of olive oil and ether, depending on the weight of the patient ($\frac{1}{2}$ to 2 oz.—14 to 57 ml.—in children). The olive oil and ether must be thoroughly mixed, and are given slowly over about 20 minutes. Some authorities advise a cleansing enema first; others do not.

It is indicated, or rather was indicated, in status asthmaticus after adrenaline had failed. Introduced in 1931 and advocated as a life-saving measure, it came into very general and widespread use, but since the introduction of intravenous aminophylline in status asthmaticus the use of rectal ether and olive oil has declined to such an extent that it is now rarely used. At one time widely advocated in the literature, it is now seldom even referred to.

Rations for an Endurance Test

Q.—What rations would be most suitable for a fit man undergoing a 25-hour endurance test in a canoe? The rations must be as light as possible, since they must be carried in the canoe during the test.

A.—There may be good reason for a plentiful supply of protein to build up muscle and to replace wear and tear during training, but there should be no attempt to supply the energy for an endurance test from the body's proteins. Carbohydrate and fat are the most suitable sources of energy, and, since the metabolic cost of fat is thought to be greater, the ration for the test should consist mainly of carbohydrate. How much is required? If the athlete could maintain an oxygen consumption of one litre of oxygen a minute throughout the 25-hour test, his total energy expenditure would be 7,500 calories; this could be provided by approximately 1,300 g. of carbohydrate, with about 400 g. of fat and 200 g. of protein in addition. In simple terms, the energy requirements would be met approximately by a diet of $1\frac{1}{2}$ lb. (0.68 kg.) of glucose and $1\frac{1}{2}$ lb. of bread made up into sandwiches with butter and a ham or cheese filling. This spartan regime could be partly replaced by more attractive substitutes, according to the whim of the athlete, provided the proportions of the three basic foods were maintained. As much as possible of the carbohydrate should be taken in the form of sugar, and common sense will suggest that such slowly absorbed forms as potatoes should be avoided. It may be useful to make up the glucose with fruit juice. Several pints of this fluid may be taken during the test, and

will help to make up the fluid and salt loss of the body, increase the alkaline reserve, and provide an immediate source of energy. A minimum requirement of fluid would be about 4 pints (2.3 litres), but thirst is as valuable a guide to water requirement as any other. It might be worth in addition taking two 5-gr. (0.32 g.) salt tablets at 8 and 16 hours, although the fruit juice would probably contain enough.

Selenium for Baldness

Q.—Is selenium sulphide of value in the treatment of alopecia? If so, what are the indications for its use?

A.—Selenium sulphide in the form of "selsun lotion" certainly appears to be useful in the control of dandruff of the scalp. However, although dandruff is often followed or accompanied by baldness (calvities) it cannot be assumed that the baldness has been caused by dandruff or that the suppression of dandruff will prevent the development of baldness.

While, therefore, this treatment has hardly been in use for a sufficient length of time to enable a judgment to be made, it seems unlikely that it can be expected to influence baldness.

NOTES AND COMMENTS

Pendulous Breasts.—Sir ARCHIBALD MCINDOE (London, W.1) writes: The rather old-womanish answer to the question on pendulous breasts ("Any Questions?" November 28, p. 1230) suggests that either they should be properly supported or the patient should go in for breast-stroke swimming, which is precisely what a woman would not want, and is almost invariably the reason why she seeks relief from the condition. Of course, the answer should have been that a surgical breast reduction should be performed by a competent plastic surgeon. This is an everyday operation and gives excellent results.

OUR EXPERT writes: This question and answer concerned the treatment of pendulous breasts immediately after cessation of breast-feeding, at which time there is much to be said for conservative measures—particularly if the patient is young and likely to have more children. Sir Archibald McIndoe's comment applies more to the treatment of breasts which remain pendulous after involution is complete and which are unlikely to be exposed again to the stimulus of pregnancy and lactation.

Causes of Failure of Contraceptive Diaphragms.—Dr. LILIAS M. JEFFRIES (Hove) writes: Referring to the question about the causes of failure to prevent conception by the use of the Dutch cap ("Any Questions?" November 28, p. 1229), I have found that a common cause is constipation. Scybala distort the shape of the vagina. Patients are often unconscious that the rectum is loaded, and need to be warned that the cap has been fitted when the bowel is empty, so that it will not fit otherwise. It is well worth while drawing attention to this point.

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THE NEPHROTIC SYNDROME*

BY

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Massive oedema unfits numbers of people, young and old, for their normal daily life. In a fair proportion heavy proteinuria is present, and this group includes the patients to be discussed here. The subject is familiar, but, it must be admitted, a completely successful treatment is not known, so that patients with the nephrotic syndrome often languish for many months or even years in hospital, or closely tied to their homes. The syndrome invites study, not only from the desire to do more to help these patients but on account of its basic scientific interest; further research into the mechanism of the disorder seems likely to extend our knowledge of renal and circulatory physiology and of human protein metabolism.

This account is not to be regarded as a full review, such as the excellent article by Bradley and Tyson (1948); rather it is a preliminary report on some of the work of the last three years undertaken by a team in Birmingham, composed of Drs. J. D. Blainey, D. B. Brewer, J. Hardwicke, D. S. Rowe, Mr. H. J. Yardley, and myself. Though the results are incomplete, the usefulness of certain ideas and techniques can be illustrated. Especially we would emphasize the need for the quantitative collection and analysis of factual data from patients of this kind. We have studied some 20 patients, a few very completely over periods of many months of illness. Other similar studies are needed, and, since the syndrome is not rare, there is no lack of clinical material.

Definitions

There is at present a risk that students of renal disease will use different names for the same condition, or, worse, the same name for different conditions. It seems reasonable to reserve the term "nephrotic syndrome," unqualified, for patients with oedema, definite proteinuria, and hypo-albuminaemia, without hypertension, without electrolyte disorders or retention of non-protein nitrogen, and without an appreciable excess of red blood corpuscles in the urine. These excluding qualifications help, especially in discussions of treatment and prognosis, without denying the possibility that some of these features may appear as late sequelae, at least in certain forms of the syndrome. In addition, the nephrotic syndrome may appear in association with other definite disorders, when one may speak of, say, "constrictive pericarditis with an associated

nephrotic syndrome," "hypertension with an associated nephrotic syndrome," etc. This form of description, of course, begs the question of common or dissociated aetiology, which seems advisable in our present state of ignorance.

Other associated disorders included in this series are congestive cardiac failure (often previously treated with mercurial diuretics for long periods), subacute nephritis (i.e., hypertension and some excess of red blood corpuscles in the urine, with a history suggesting previous attacks of more acute renal disease), and femoral thrombosis. In Table I the series is described by diagnosis, sex, and age. Classifications based on the morbid anatomical structure of the kidney have been avoided, since but few of these patients have died, and since, in those that have, our ability to predict the structural changes from studies on living patients has proved to be quite limited.

TABLE I.—Diagnosis of Patients Studied in Present Series (Common Feature—Proteinuria)

Diagnosis	Age of Females	Age of Males
Nephrotic syndrome (uncomplicated)	7 years 14 " 17 " 20 " 30 " 42 " 48 "	7 years
Acute nephritis		31 " 36 "
Subacute nephritis with associated nephrotic syndrome	20 "	36 " 37 "
Hypertension with terminal renal failure, associated nephrotic syndrome		55 " 65 "
Congestive cardiac failure, associated nephrotic syndrome	35 " 59 "	
Femoral (and ? caval) thrombosis, associated nephrotic syndrome	55 " 58 "	

* Constrictive pericarditis.

Prime Cause of Oedema

Various suggestions have been made regarding the prime cause of oedema in the nephrotic syndrome. The most widely held view, following on the publication of Starling's (1896) work, has been that the reduced colloid osmotic pressure of the plasma, a function of the hypo-albuminaemia, is responsible. Our studies support this idea, though some qualifications and extensions are necessary in the light of current knowledge. The evidence in favour of the hypothesis is largely based on the following observations.

*Based on a lecture delivered by invitation of the Academic Council of the University of London on November 30, 1953.

(1) The colloid osmotic pressure (C.O.P.) of nephrotic-syndrome plasma is greatly reduced below the normal average, at least so long as oedema is present. With normal values of 40–50 cm. of water in our measurements, nephrotic plasmas have given readings of 5–25 cm. of water. This evidence is of positive association between a lowering of C.O.P. and oedema formation.

(2) Samples of oedema or ascitic fluid have shown low protein values (less than 0.2 and 0.1 g.% respectively), and, when measured, a negligible C.O.P. (This is true even when pseudo-chylous effusions are found.) This evidence may be regarded as excluding gross capillary permeability to colloid as a cause.

(3) Infusions of salt-free colloid (e.g., 50–100 g. of human albumin, 40–80 g. of transfusion dextran) have almost always led to an increase during the ensuing 24 hours of water and sodium chloride excretion. This is interpreted as a mobilization of oedema fluid with its elimination in the urine. The albumin infusions, for example, cause a rise in C.O.P. (from 10 to 20 cm. of water) over this period. (A concomitant increase in plasma volume is usually found.) The diuresis is usually transient, the C.O.P. falling rapidly to the pre-infusion level, though exceptions to this result are noted in a later section. This evidence provides an instance of positive association between rising C.O.P. and oedema reduction.

Two accessory factors operating in oedema production needing discussion are sodium chloride retention and plasma volume reduction. Retention of sodium has been blamed as the primary cause of the oedema by a school of workers, and, indeed, it is a pronounced feature of the disease. Whether on moderate (100 mEq/day) or low (30–40 mEq/day) intakes of sodium, patients are observed who lose less than 10 mEq of sodium daily for week after week. This is a remarkable tribute to the efficiency of at least one component of the tubular reabsorptive capacity of diseased kidneys, for the constancy of the sodium content of the oedema fluid is closely maintained at about 125 mEq/litre. (The plasma level is often about 135–140 mEq/litre, a little below the normal value of 145 mEq/litre. This is probably attributable to the hypo-albuminaemia, since the normal plasma albumin level binds some 10 mEq of sodium/litre.) Clearly, if chemical constancy of the internal environment is to be maintained, retention of sodium must be effected when oedema is forming. It seems, then, that the sodium retention in these patients is a secondary physiological adaptation to meet the situation of oedema formation. This view is strengthened by the immediate response, already mentioned, to colloid infusions when as much as 70–100 mEq of sodium may be released in a day. Chloride metabolism is, of course, similarly affected.

C.O.P. Measurements and their Interpretation

Our measurements of colloid osmotic pressure have been done with an instrument (Fig. 1) with some novel features which make it well adapted to clinical studies. The use of a mechano-electronic transducer valve makes it possible to decide in one minute or less whether fluid is being transferred from the Ringer compartment of the osmometer to the serum sample, or vice versa. By a few successive trials the pressure which has to be applied to the serum to prevent any movement between the compartments is found; this is the C.O.P. Parallel tests on plasma and serum have shown no significant difference, and serum is usually tested as a matter of convenience.

The effect on C.O.P. of diluting a normal serum specimen with Ringer's solution is shown in Fig. 2. It can be seen at once that the relation between C.O.P. and protein concentration is not the simple straight line passing through

the origin expected from solutions obeying the simple gas-laws of physical chemistry. The graph is markedly curved, being concave upward, so that at the order of concentrations present in normal serum the C.O.P. is about double that predicted from the molecular weight of its constituents. (Transfusion dextran solutions show a similar or greater

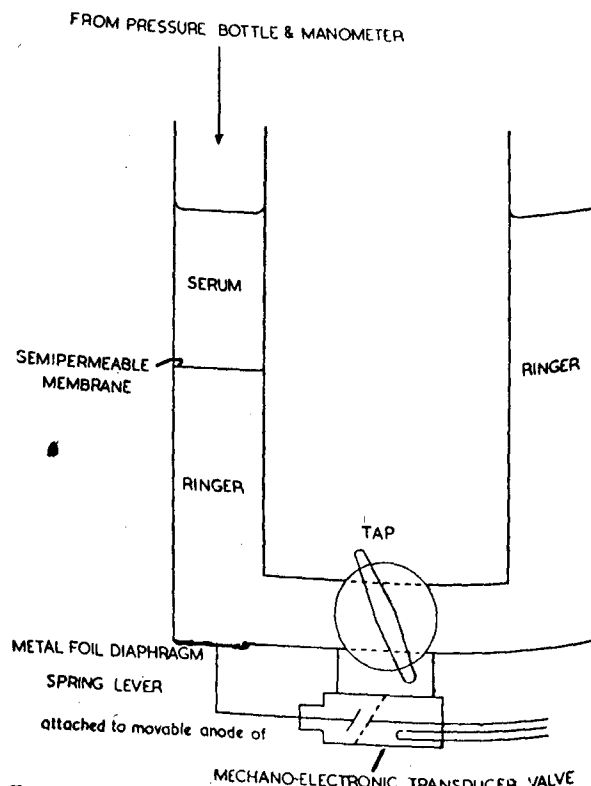


Fig. 1.—Principle of rapidly acting osmometer (D. S. Rowe). When tap is closed osmotic pressure of serum draws fluid through semipermeable membrane, causing upward bulging of diaphragm and changed resistance of transducer valve, which is electrically recorded. The air pressure which has to be applied to the surface of the serum to nullify this effect is equal to the C.O.P. of the serum.

effect.) The accurate determination of this curve is important in several ways. To the chemist the form of the curve at very low concentrations is of interest. From this region, where complications such as intermolecular forces, Donnan effects, etc., are negligible, the mean molecular weight of serum proteins can be calculated. (In Fig. 2 this is shown as the dotted line "limiting gradient.")

The physician is more concerned with two characteristics of the curve at and near the concentrations found in the blood. In the first place, the natural level of C.O.P. is important, for it must be related to the level of hydrostatic pressure at which there is no net movement of fluid through the capillary wall. In addition, the slope of this curve (shown by the dotted line labelled "physiological gradient" in Fig. 2) should be considered. This slope must affect the precision of the homeostatic mechanism governing the relation between plasma and interstitial fluid volumes. Suppose that a little fluid is ultrafiltered from the plasma into the interstitial space, some haemoconcentration will result and the C.O.P. will rise to an extent depending on the physiological gradient. This rise in C.O.P. will tend to oppose further ultrafiltration and so to maintain homeostasis. Conversely, haemodilution will be opposed by the fall in C.O.P. induced. Thus the steeper the physiological gradient the more exact the homeostatic control.

In Fig. 3 the state of affairs with a nephrotic syndrome serum is shown. Again dilutions with Ringer's solution have been prepared and the C.O.P. of each measured. This has made it possible to show that not only is the C.O.P. diminished greatly (to 19.1 cm. of water in this instance),

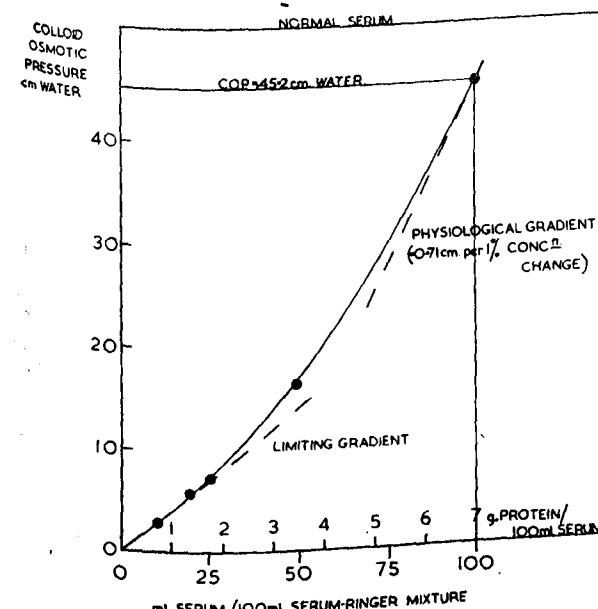


Fig. 2.—C.O.P. of normal serum, full-strength and at various dilutions. The limiting gradient at zero concentration is inversely proportional to the mean molecular weight of the serum colloids. The physiological gradient of full-strength serum is steeper, and is important for the maintenance of constant plasma volume *in vivo*.

but that the physiological gradient is also much less steep. Other factors being equal, not only will the nephrotic-syndrome patient be tending to lose fluid from plasma to interstitial space, but he will also, when some form of balance has been obtained, have a greatly diminished power of regulating the volume of either compartment—a small rise in, say, capillary pressure will tip the balance towards oedema formation, and a much larger fluid shift than normal will occur before a sufficient rise in C.O.P. has occurred to counterbalance the effect. At this stage it may be noted that the measurements here set out are made with semipermeable membranes completely impervious to the serum colloids. In that the blood capillaries are known to be normally slightly permeable, at any rate to the smaller proteins of the plasma (e.g., albumin), the physiological osmotic pressures will be fractionally less than those shown here.

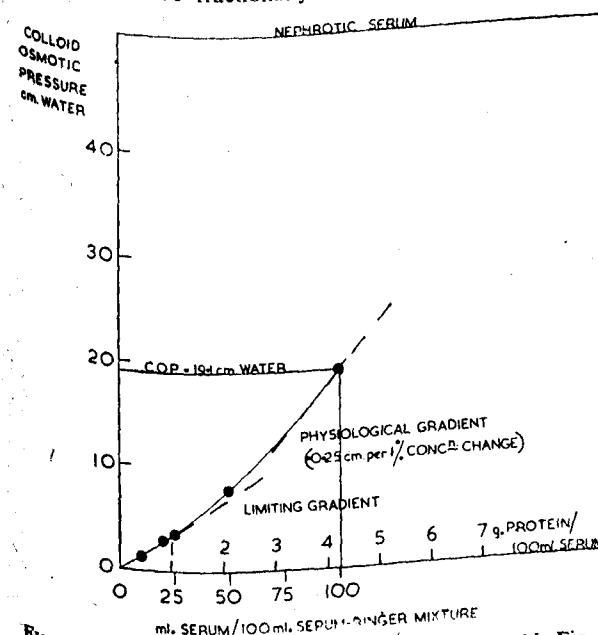


Fig. 3.—C.O.P. of nephrotic serum for comparison with Fig. 2. C.O.P. and physiological gradient considerably reduced. Limiting gradient (cm. water/1 g. protein per 100 ml. serum) somewhat reduced.

It is thought that this difference is not likely to be appreciable, in that the speed of transmission of protein through capillary walls is many thousand times less than the speed of transmission of its Ringer-like solvent.

A further extension of the Starling theory is indicated by the knowledge now current that the interstitial space is occupied by a colloid gel, histologically seen as "ground-substance" lying within a network of collagen and other fibres. In Starling's time the interstitial space separating the vessel wall from the cellular contents tended to be thought of as a potential space analogous to the peritoneal and pleural cavities—assuming appreciable dimensions only in pathological states like oedema, ascites, or pleural effusion. To-day, estimates of the interstitial space in normal subjects suggest a volume perhaps about four times as great as the plasma volume, and that in health this volume is maintained with fair constancy. This state of affairs is inconceivable on the simple Starling hypothesis—the slightest

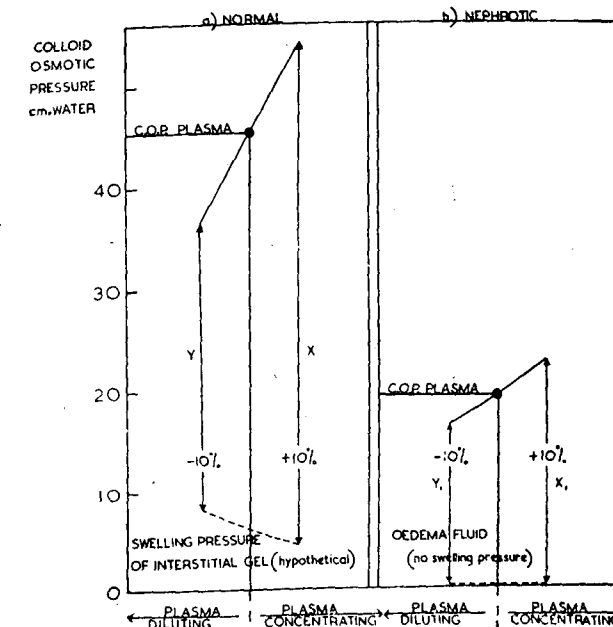


Fig. 4.—Illustration of two factors postulated as minimizing plasma volume alterations in normals (a), with reduced effectiveness in the nephrotic syndrome (b) (for explanation, see text).

discrepancy of mean capillary hydrostatic pressure and mean plasma C.O.P. would produce a progressive alteration in interstitial volume. Mechanical tissue tension in the sense of skin tightness cannot be responsible for interstitial space volume maintenance, as this tension is absent in various anatomical regions. Another factor which must be taken into account in the qualitative difference between oedema fluid and normal interstitial fluid is the tendency of oedema fluid to gravitate and to pit on pressure. This feature is prominent in patients with only, say, 5 litres of oedema—an increase in total interstitial fluid volume of less than 50%.

These difficulties are removed if the interstitial space is regarded as being occupied by a gel. It is known that such gels have a "swelling pressure," analogous to the C.O.P. of a soluble colloid. This swelling pressure tends to attract aqueous solutions into the gel up to a certain limit. At this level the swelling pressure is zero, imbibition ceases, and further addition of water leaves free fluid. This point, it is suggested, corresponds to the level at which oedema is found. Removal of water from a gel is resisted by the swelling pressure, which can be overcome by the exercise of mechanical pressure or by opposing the swelling pressure by C.O.P. In general, swelling pressures tend to rise rather steeply with progressive removal of water. Actual values for the swelling pressure of the interstitial gel have not, so far as is known, been measured. In Fig. 4a the swelling pressure for a normal man has been marked as a hypo-

thetical line. In Fig. 4b the situation in the nephrotic syndrome with oedema present is depicted—no swelling pressure is available to oppose the tendency of fluid to shift to and from the plasma. This, together with the reduced physiological gradient of C.O.P. already described, must make the regulation of plasma volume much more precarious than in the normal subject. In quantitative terms, $(X_1 - Y_1)$ is much less than the corresponding normal difference $(X - Y)$ (Fig. 4).

Insufficient measurements have been made of plasma volume or of red-cell mass in the nephrotic syndrome. According to Borst (1948) the plasma volume is usually reduced below normal and the few determinations we have made, using the dye T.1824, confirm this. The reduction is not always great (usually 5–25%), assuming significance only when related to the plasma volume of patients with a comparable degree of anaemia. This is necessary because the plasma volume tends to rise above normal with anaemia (thus tending to lessen the reduction in overall blood volume which would otherwise result). In the anaemia commonly found with the nephrotic syndrome a similar rise occurs, but of less degree. The plasma volume may also be somewhat reduced by salt deprivation even of the degree induced by therapeutic diets.

To conclude this discussion of the relation between the oedema of the nephrotic syndrome and the reduced C.O.P. associated with hypo-albuminaemia, we must agree with other workers that diuresis may occur before any definite rise in serum albumin concentration is found. This is demonstrated in Table II. The patient had been on a low-

TABLE II.—Factors Concerned in Diuresis

	1952		1953		
	Nov. 14	Nov. 29	Jan. 7	Jan. 22	Jan. 31
P.C.V.	39	40	25	25	41
Serum albumin, g./100 ml.	0.47	0.51	0.50	0.77	0.99
Plasma volume, ml.	1,780	1,710	3,360	3,360	2,610
Total circulating albumin g.	8.4	8.7	16.8	25.8	26.2
Mean daily weight change g.	+180	+300	-66	-300	-280

Female, 55 kg. High protein intake from November 14, blood transfusion 720 ml. packed cells on January 29, 1953.

In November, 1952, oedema was accumulating. Diuresis began at the beginning of January, 1953 (see weight changes). Note that serum albumin concentration had shown no appreciable change by January 7, but the packed cell volume (P.C.V.) had fallen greatly. This is interpreted as being due to a considerable increase in plasma volume and total circulating albumin.

salt and high-protein diet for many weeks; a markedly positive nitrogen balance was recorded throughout the period shown. Until the middle of December, 1952, steady accumulation of oedema and ascitic fluid continued, making paracentesis repeatedly necessary. This oedema formation is shown for simplicity in Table II by records of weight change: sodium, chloride, and water retention confirmed its nature. Then the trend was gradually reversed, until at the beginning of January a large diuresis occurred. At this point the serum protein concentrations were essentially unchanged. But the packed red cell volume had fallen from 40% to 25% in a matter of weeks, no evidence of haemorrhage or haemolysis being noted. Apparently, therefore, a considerable increase in plasma volume had occurred. The diuresis was not a function of a rise in glomerular filtration rate, as judged by creatinine clearance, which actually appeared to fall, only to rise again when the diuresis was completed. Only towards the end of January, when the diuresis was more than half completed, the serum albumin concentration rose somewhat, no further plasma volume increase being noted.

At this point a transfusion of packed red cells was given for therapeutic purposes, and this enabled the approximate estimate of actual plasma volume, shown in Table II, to be made. It seems that between November and January the total circulating albumin increased about twofold. Unless protein is added very rapidly to the circulation as by transfusion, an increase in plasma volume rather than in protein concentration is what might be expected to follow an increase in total circulating albumin when free oedema is

present. When the oedema has been removed, on the other hand, further abstraction of water from the interstitial space into the plasma will result in increased swelling pressure of the interstitial gel, and can only be achieved by reduction in capillary blood pressure or by a rise in serum C.O.P.

In conditions other than the nephrotic syndrome, alterations in interstitial gel may occur. Myxoedema involves its presence in exaggerated amounts (and perhaps in abnormal quality). A reduction in the interstitial gel may be a contributory factor to the production of famine oedema, and perhaps also to oedema in patients with the nephrotic syndrome after prolonged underfeeding.

Changes in Other Serum Proteins Associated with Hypo-albuminaemia

The introduction of paper electrophoresis for the separation of serum proteins has for the first time made possible numerous and repeated examinations of nephrotic syndrome sera and urines. In our department, Dr. Hardwicke has paid particular attention to validating the quantitative results. Differential analysis is made by elution of the dye bromphenol blue from the sites clearly stained by adsorption on to each component. Elution is also carried out from intermediate areas, and allowance is made for tailing of the serum albumin—the fastest-moving component which has travelled over the areas of paper eventually occupied by each globulin fraction. Total serum proteins have been estimated by a biuret method, while the fibrinogen in plasma samples is estimated by the Folin and Ciocalteu method after collection as a clot and redissolving in soda.

Without doubt the protein which is reduced to the greatest extent in the nephrotic syndrome is the serum albumin. As already described, there is fair correspondence between the serum albumin concentration and the C.O.P. Albumin levels have therefore been taken as an index of the severity of the condition from patient to patient and from time to time. Other serum constituents and other features of the syndrome (e.g., the degree of proteinuria) have been compared with the serum albumin level.

In Fig. 5 the total concentration of plasma proteins is plotted graphically against the serum albumin concentra-

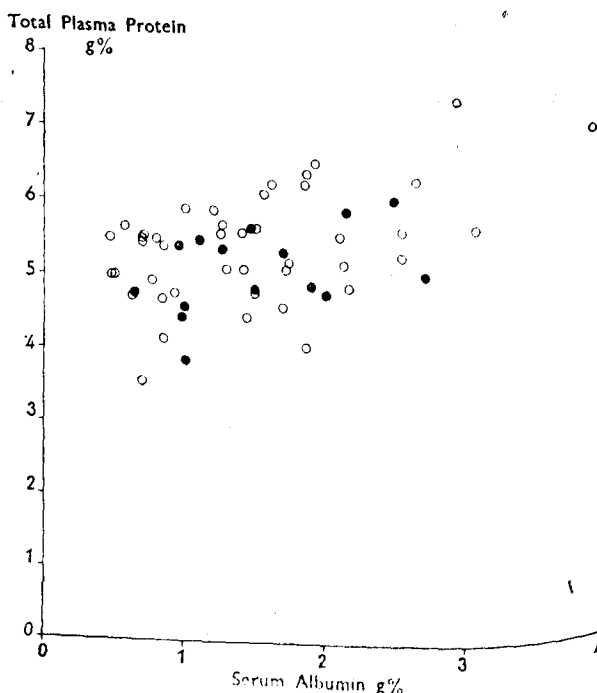


FIG. 5.—Total plasma protein and serum albumin concentrations in patients with proteinuria (J. Hardwicke). For serum albumin levels falling below 2 g./100 ml. there is little further reduction in total plasma protein level. (Contrast findings in malnutrition, liver disease.) In this and subsequent figures the first determination on each patient is shown ●, subsequent readings being shown ○.

on, each being expressed as g.% (15 patients, 59 determinations). The results show that down to a serum albumin concentration of 1.5–2 g.% the level of total serum proteins falls from its normal range of 6.5–8 g.% to about 4.5–6 g.%. Below this value of serum albumin level there is little further fall in total protein, patients with serum albumin levels of below 0.5 g.% maintaining a total protein concentration of 4.5–6 g.%. In this series only one patient showed a total serum protein level of less than 4 g.%—in other words, very low levels of serum albumin concentration are accompanied by a rise in concentration of some globulins. This result contrasts with the findings in other forms of hypoproteinaemia due, for instance, to malabsorption of food from a diseased intestine, when the total protein level may fall to 1 g.%.

In Table III the relation between hypo-albuminaemia of increasing severity and other changes in plasma constituents is shown. Values have been expressed in terms of % of

TABLE III.—Relation Between Hypo-albuminaemia of Increasing Severity and Other Plasma Changes

Plasma Fraction	Molecular Weight	Normal		Nephrotic		
		g./100 ml.	% Normal	Mean Values and Range		
Albumin	69,000	4.0	100	50	26	14
				(45–53)	(23–29)	(12–19)
α_1 -globulin	45,000	0.3	100	103	84	57
				(66–140)	(33–150)	(17–113)
γ -globulin	156,000	0.9	100	86	81	63
				(44–187)	(38–140)	(39–72)
β -globulin	90,000 and 1,300,000	0.6	100	129	157	136
				(80–170)	(83–193)	(100–183)
α_2 -globulin	300,000	0.6	100	152	228	295
				(100–240)	(145–347)	(133–400)
Fibrinogen	450,000	0.3	100	197	286	354
				(123–323)	(197–400)	(280–460)
Cholesterol	—	0.3	100	170	288	330
				(104–194)	(103–395)	(259–478)

Each column is based on 10–15 observations. Note that the smaller proteins (α_1 - and γ -globulin) fall with albumin, whereas the other fractions rise.

normal averages to facilitate ready appreciation of the relative extents of the changes involved. The ranges observed are also shown beneath each mean. In spite of fairly large variations, some due to experimental error and some to case-to-case variation, all the patients conformed to clear-cut trends. This is notable in view of the probable diversity of aetiological agents concerned. With albumin levels reduced to below 30% of normal, α_2 -globulin, fibrinogen, and cholesterol concentrations were invariably raised, increases to 300% of the normal average being the rule with severe hypo-albuminaemia. By contrast, the globulin fractions with smaller molecular weights (α_1 - and γ -globulin) tended to fall with (though not so much as) the albumin; usually the α_1 -globulin falls to a greater extent than the γ -globulin. The β -globulin rises somewhat, usually to between 100% and 200% of normal. (This finding in particular differs somewhat from the picture described by others using classical free boundary electrophoresis where concentrations are measured by refractometry—a method which estimates the lipids associated with the β -globulin along with the protein.)

As, unfortunately, little is still known even of the normal functions of the various serum proteins, these changes cannot be said to cause or to correct any definite abnormality. The plasma viscosity is raised rather than reduced, for the proteins which rise in concentration are large, and in some instances probably asymmetric. It is tempting to associate the fall in γ -globulin with the known tendency of these patients to develop infections. The small degree of fall of the globulin would be unconvincing in this respect were it not known that the γ -globulin fraction is composite, and that some antibodies may perhaps be reduced more than the main γ -globulin fraction. β -globulin is complex also; the small metal-carrying β -globulin is probably reduced more than the larger lipoprotein associated with this fraction. Certain negative conclusions can be drawn. The rises in α_2 -globulin, fibrinogen, and total cholesterol are far too great to be accounted for simply in terms of reduced plasma

volume with ensuing concentration of some constituents. On the other hand, α_2 -globulin and fibrinogen, having molecular weights five times greater than serum albumin, cannot compensate directly for the reduction in colloid osmotic pressure associated with a reduction of serum albumin from, say, 4 g.% to 0.5 g.%. To do this the α_2 -globulin and fibrinogen level would need to rise to some 15 g.%—and the resulting solution would resemble treacle in consistency.

Extent of Dependence of Serum Abnormalities on Proteinuria

The clinical association between reduced serum albumin levels and severe proteinuria has often been held to show that the serum abnormality depended directly upon the urinary loss. An alternative view has been that some serum proteins, in particular the albumin, are produced in inadequate amounts in the nephrotic syndrome. These two views are, of course, not mutually exclusive.

Urine samples collected during 24-hour periods and serum obtained on the same day have been subjected to electrophoretic analysis. The same protein fractions—albumin and four globulin components—appear in each, having similar mobilities, and showing only these same fractions when electrophoresis is carried out on a mixture of urine and serum. There seems no reason to doubt, therefore, that the protein found in the urine has “leaked” from the blood via the kidney. The relative amounts of the different fractions, however, is not the same—the urine/serum ratios being always in descending order—albumin, α_1 -globulin; β - and γ -globulin; α_2 -globulin. (In acute nephritis the ratios may be almost identical, as discussed below.) In other words, the losses of albumin and α_1 -globulin tend to be large while that of α_2 -globulin is small. No doubt these losses are dependent on molecular weights—the small proteins, like albumin, passing readily through the glomerular wall, the large molecules of α_2 -globulin being restrained. It is also tempting to associate the facts that the albumin and α_1 -globulin are the proteins most reduced in nephrotic plasma as supporting evidence for the idea that serum changes in the nephrotic syndrome depend largely upon the urinary losses.

More evidence is obtainable from comparing the daily urinary losses of protein with the degree of hypo-albuminaemia on repeated examinations of a number of patients. This comparison is shown in Fig. 6, in which serum albumin concentration is plotted against daily albumin excretion (Fig. 6a) and daily total protein excretion (Fig. 6b). Losses are plotted as g./kg. normal body weight so as to make valid comparisons between large and small patients. A clear association is seen with low serum albumin levels accompanying large urinary losses. Statistical analysis shows this association to be highly significant, and regression lines have been calculated and drawn to show the most likely average relationship in these patients. It should be noted that all the patients from whom these values were derived had longstanding proteinuria; all were on a good hospital diet—in one or two instances only on very high protein diets (over 120 g. of protein a day).

A tentative interpretation may be put forward to explain the relation between albumin excretion and plasma (=serum) albumin level. Normally plasma albumin levels are constant at about 4 g./100 ml., production and utilization being equal. If urinary loss of albumin occurs and production remains steady the plasma level must fall; if utilization also remains steady the fall would continue until no plasma albumin was left. But if utilization is dependent upon plasma albumin concentration in some way, a new balanced state can be envisaged, hypo-albuminaemia being dependent on the degree of albuminuria. Most of these patients showed, in fact, remarkably steady levels of plasma albumin and of albumin excretion in the urine over periods of many weeks. In other words, they were in dynamic equilibrium so far as plasma albumin was concerned—albumin production being equal to the sum of albumin loss by excretion and albumin utilization. In a normal person, with a negligible excretion

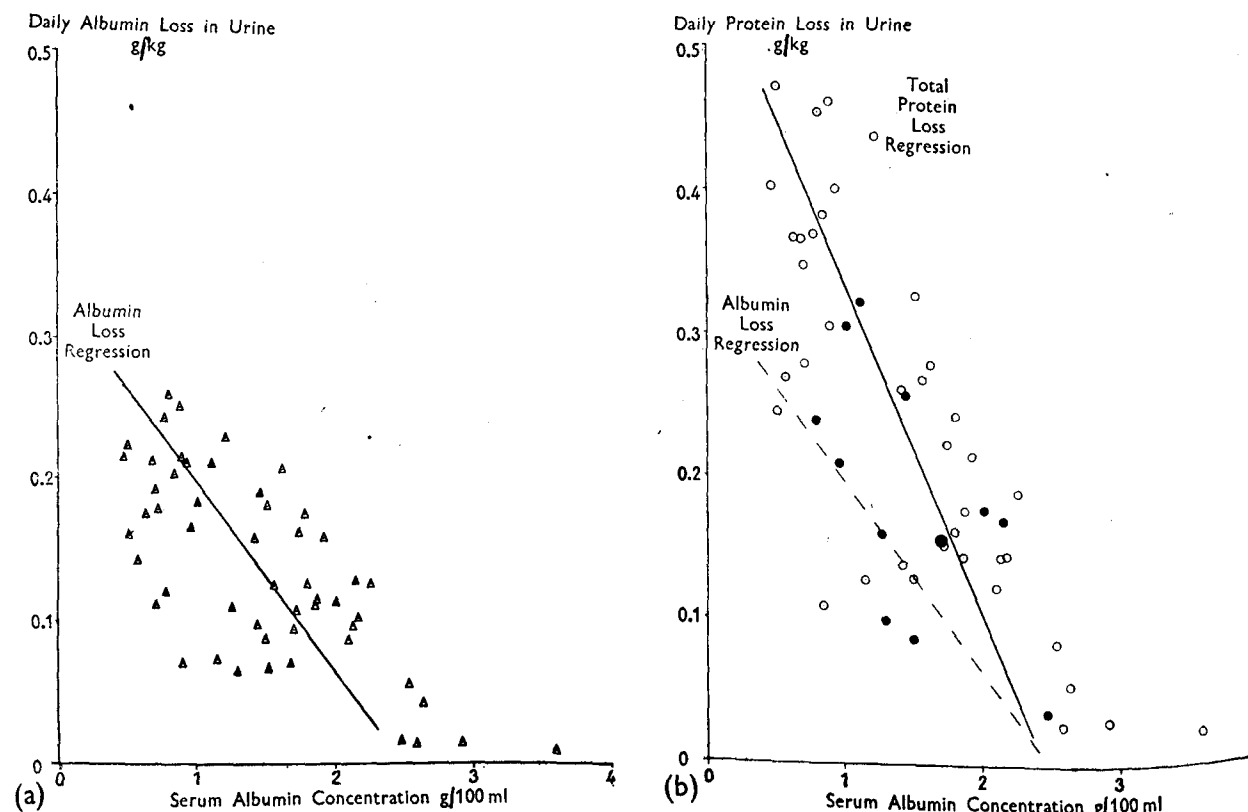


FIG. 6.—Relation between hypo-albuminaemia and daily loss in urine of (a) albumin, and (b) total protein (J. Hardwicke). Regression lines are in each case highly significant, indicating close association of the blood changes and the extent of proteinuria.

of albumin, production is entirely balanced by utilization, which amounts to some 0.25 g./kg./day according to published studies using radioactive techniques (e.g., Sterling, 1951).

Several of the patients excreted 0.25 g./kg./day with constant serum albumin levels; even if utilization had fallen to zero their rate of albumin production was clearly not grossly impaired. If one were to assume that utilization of albumin had remained normal, their production must in every case have been greater than normal, in some instances reaching over 200% of the normal figure. In fact, it seems more plausible to suppose that albumin utilization in hypo-albuminaemia lies between these wide possibilities of zero and normal values. Interesting results are obtained if the assumption is provisionally adopted that albumin utilization is directly proportional to plasma albumin concentration; a similar hypothesis is known to be applicable in various situations with the utilization of glucose at different plasma glucose levels. If albumin utilization is taken as 0.25 g./kg./day with normal plasma albumin levels (4 g./100 ml.), utilization for any level of plasma albumin (P) is given by: $(\text{utilization} = \frac{P}{4} \times 0.25)$. Production is then calculated from $(\text{utilization} + \text{excretion})$. From the 53 determinations charted in Fig. 6a, calculated production levels fall between 48% and 124% of normal, with a mean value of 92% as shown in Table IV.

These figures should be treated with considerable reserve; they are, indeed, little superior to an informed guess. It is perhaps opportune to make such an estimate, for techniques available for accurate estimation in occasional patients are being used in other laboratories. In other words, the figures can be checked. They further emphasize that patients are not constant in this respect; indeed, protein production can apparently vary at least between production levels 60% of normal in severe cases and 120% of normal in convalescence on a liberal protein diet. When quoting experimental determination of albumin production, therefore, it is most desirable to give details of the diet, the daily albumin excretion, and the plasma albumin level.

TABLE IV.—Albumin Production Values in Nephrotic Patients Calculated from Albumin Excretion and Plasma Albumin Concentrations (53 Observations)

Calculated Albumin Production (% of Normal)	No. of Observations
48-51	1
52-59	1
60-67	3
68-75	7
76-83	5
84-91	7
92-99	11
100-107	6
108-115	7
116-123	7
124-127	4

(Based on assumptions:—1: Production = utilization + excretion. 2: Utilization = $\frac{\text{plasma albumin}}{4} \times 0.25$. 3: Normal production of albumin = 0.25 g./kg./day.) Data as for Fig. 6.

The automatic control of plasma albumin level by means of an albumin utilization rate which rises and falls with this level is presumably the main factor leading to steady levels of hypo-albuminaemia when underproduction occurs without proteinuria (e.g., liver disease). But in renal disease a further factor which determines the plasma albumin level is the marked rise in proteinuria which, without any change in the permeability of the kidney, accompanies any increase in plasma albumin. Such increases may occur naturally with increasing production or be artificially produced with albumin infusions. A rise of plasma albumin by 10% increases protein excretion by about 15%. (Taking into account the increased utilization, the plasma albumin level will rise only 10% in this way if production is stepped up by about 25%.) The effect of such plasma alterations in proteinuria gives useful indications of the exact kind of renal damage in individual patients.

Analysis of Renal Defect which Results in Proteinuria

For many years now there have been debate and confusion about the relative importance of glomerular and tubular lesions in disease processes affecting the kidneys. Histological evidence has focused attention on the glomerular

lesions in acute nephritis, but has shown obvious tubular changes, including pronounced fatty degeneration in patients who showed severe proteinuria and oedema as the chief abnormality before death. In this nephrotic group glomerular changes have been difficult to find; a special form of thickening of the glomerular basement membrane has been described as occurring in what is now often known as Ellis "type II nephritis" (Ellis, 1942), but even these changes are often slight.

The conclusions to be drawn from urinary abnormalities during life have been less definite. The excretion of red blood corpuscles in acute nephritis is reasonably interpreted as severe damage in limited areas of the glomerular membrane. Specific tubular defects are now well recognized in patients able only to a very limited extent to alter the concentrations of certain ions or other substances of low molecular weight in the urine. But the relative contribution of glomerular and tubular defects to severe proteinuria has remained unknown. So long as the normal glomerulus was supposed to produce a protein-free ultrafiltrate, opinion was naturally inclined to the view that proteinuria depended entirely on a glomerular defect. If one accepts the evidence from direct sampling of glomerular fluid that both cold- and warm-blooded animals pass some protein into the glomerular filtrate, tubular reabsorption of protein must be recognized as a normal process. Proteinuria therefore could theoretically arise from glomerular damage, allowing so much protein to be filtered that the tubular mechanism was saturated before all protein was reabsorbed, from tubular damage alone or from a combination of glomerular and tubular damage. At present our ability to correct either defect is limited (or in most instances non-existent), but establishing the degree of damage to glomeruli and tubules in each individual patient is a prerequisite of a rational assessment of the problem.

From electrophoretic estimation of proteins in urine and serum, an "apparent" (or urinary) clearance can be calculated for each fraction—that is, the ratio of the quantity excreted (expressed as mg./min.) to the serum concentration of the fraction under consideration. Now if no reabsorption of protein occurred in the tubules these apparent clearances would represent the "true" (or glomerular) clearances of each protein fraction. If reabsorption does occur, these apparent clearances will be less than the true clearances by an amount depending on the proportion of the protein reabsorbed during any particular test.

Both true and apparent clearances of protein fractions will depend directly upon the glomerular filtration rate. This has been estimated in all tests on the patients considered here from the clearances of endogenous creatinine. With the precaution of adsorbing serum creatinine on to kaolin to eliminate errors due to other substances giving similar colours with the Jaffé reagent, we believe this test gives a reasonably reliable indication of the glomerular filtration rate, at least with results of over 30 ml./minute. The disadvantage of the small errors which probably remain is offset in clinical studies by the minimal disturbance of the patient, the test requiring only a single venepuncture and an accurately timed collection of urine over a four-hour period. Creatinine clearances are also of considerable value in assessing the progress of patients. In agreement with other workers, we find that clearances of less than 20-30 ml./minute, if maintained over a period of weeks, indicate a poor prognosis.

From the apparent clearance of a protein fraction divided by the creatinine clearance, a value can be obtained for the "apparent relative clearance" of each protein fraction. This value will similarly be less than the true relative clearance in each case by an amount depending upon the proportion of protein reabsorbed by the tubules. In the absence of knowledge of this proportion, we have adopted certain hypotheses, capable of subsequent testing by measurements. These are:

(a) The amount of protein which can be reabsorbed each minute (T_{Mr}) in the tubules of each patient is limited and fixed.

Over any period of two to three days (except in acute conditions) this amount does not fluctuate. When proteinuria is present this potential reabsorption is fully active.

(b) The tubules do not distinguish between different protein fractions—the reabsorptive channels for, say, albumin and for γ -globulin being the same. It follows that if, say, 40% of the total protein in the glomerular filtrate is being reabsorbed, 40% of the albumin and 40% of the γ -globulin present are reabsorbed. The amount (as opposed to the proportion) reabsorbed will depend on the amounts of each protein in the glomerular filtrate.

Since the amount of protein per minute which can be reabsorbed is fixed, the proportion of the protein passed into the glomerular filtrate and then reabsorbed is less the greater the amount passed. It follows that the apparent relative clearance is lower than the true relative clearance of any protein fraction by an amount depending on this proportion reabsorbed; the apparent relative clearance will rise to approach the true value as the amount of protein excreted in the urine per minute is increased—for example, as the result of increasing the concentration of any serum protein. Furthermore, if exact measurements are made of apparent relative clearances of, say, albumin every few hours when total protein excretion changes and is measured, the true relative clearance and the amount of protein reabsorbed per minute can be calculated. This has been achieved by measurements made before and after abruptly increasing the serum albumin level by an infusion of human serum albumin. The calculation depends on the expression:

$$\frac{(\text{True relative clearance of albumin})}{(\text{Apparent relative clearance of albumin})} = \frac{(\text{Protein passed in glomerular filtrate/min.})}{(\text{Protein passed in urine/min.})} = \frac{(\text{Protein reabsorbed by tubules/min.} + \text{Protein passed in urine/min.})}{(\text{Protein passed in urine/min.})} = \frac{(\text{TMP} + \text{protein passed in urine/min.})}{(\text{Protein passed in urine/min.})}$$

or by rearrangement:

$$(\text{True relative clearance of albumin}) = (\text{TMP} + \text{protein passed in urine/min.}) \times \frac{(\text{Apparent relative clearance of albumin})}{(\text{Protein passed in urine/min.})}$$

Since each clearance estimate is subject to a degree of experimental error, successive clearances and total protein excretions over four-hour or eight-hour periods are measured. The results are shown graphically in Fig. 7, the protein excretions per minute being plotted vertically, and the ratios of (protein passed in urine)/(apparent relative clearances) on the horizontal axis. It can be seen that, in fact, for albumin a straight line is obtained, in agreement

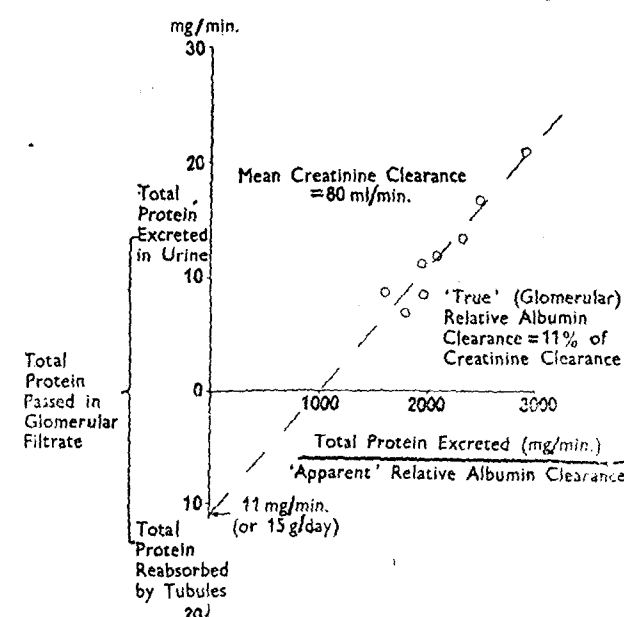


FIG. 7.—Use of albumin infusion to measure glomerular permeability to albumin (calculated from gradient) and rate of protein reabsorption by tubules (from intercept on vertical axis). (Female patient, C. J., 54 kg. Albumin infusion 45 g., June 5, 1952.) Explanation of method is given in text.

with the hypothetical reasoning set out above. The slope of this line represents the true (glomerular) relative clearance of albumin, while the negative intercept on the vertical axis represents the amount of total protein reabsorbed each minute by the tubules.

The general form of result shown in Fig. 7 has been confirmed by five other tests on a total of three patients with the nephrotic syndrome. In all, the relationship has been a straight line within the limits of experimental error, as predicted from the argument already given. In all, a negative intercept has been obtained, indicating that some protein was being reabsorbed by the tubules. When a substantial increase in proteinuria occurred in association with the raised serum albumin, it disappeared with the return of serum albumin to pretransfusion levels—that is, no fresh renal damage followed the infusions. Although the serum globulins showed little tendency to alter after the albumin infusion, during the period of increased proteinuria the apparent relative clearances of these globulins increased in proportion to the increase in apparent relative clearance of albumin. This supports the concept that the tubules' capacity to reabsorb protein is uninfluenced by the nature of the protein presented to them in the glomerular filtrate, as was suggested above. The different proteins compete with each other on equal terms, as it were, for reabsorption.

If this method of investigating the renal defect resulting in proteinuria is accepted, tentative answers may be given to some salient questions. Is the tubular capacity for protein reabsorption affected in the nephrotic syndrome? Is a glomerular defect present? If so, what different forms of glomerular damage occur in different kinds of renal disease? This kind of investigation has not yet been carried out often enough for broad generalizations. In one patient tested, protein reabsorption was very low as compared with the other two patients. Grossly defective tubular reabsorption, on occasion, then, occurs, and it is worth noting that in this patient there was other evidence of tubular dysfunction. Serum electrolyte levels became disordered, and after death, some months later, very severe damage to tubule cells was shown by histological examination. This patient was suffering from subacute nephritis with malignant hypertension, accompanied by the nephrotic syndrome. Slighter degrees of tubular defect are possibly present—for example, in patient C. J., illustrated in Fig. 7—but this remains uncertain until more knowledge of normal tubular reabsorptive capacity for protein is obtained.

Some degree of glomerular defect appears to be present in all of the patients so far studied. If we are correct in assuming that tubular reabsorption of protein is substantially non-selective, and depends only on the relative concentrations of the different proteins in the glomerular filtrate, it follows that the ratios of, say, the apparent α_2 -globulin clearance to the apparent albumin clearance is identical with the ratio of the true (glomerular) clearances of these proteins. If the various globulin clearances are expressed as percentages of the albumin clearance in each patient tested, some information is given about the nature of the glomerular defect. In uncomplicated examples of the nephrotic syndrome, typical values found are: α_1 -globulin (70–150%), α_2 -globulin (2–20%), β -globulin (10–50%), and γ -globulin (5–40%). In acute nephritis, on the other hand, the globulin clearances mostly range from 50 to 150% of the albumin clearance, with slightly lower values for α_2 -globulin on occasion. Apparently, therefore, the defective areas of the glomeruli in acute nephritis transmit the different plasma proteins indiscriminately, the larger molecules of, say, γ -globulin being passed into the glomerular filtrate as readily as albumin.

If the glomerular membrane be regarded as a kind of sieve, in acute nephritis a few of the "holes" must be grossly enlarged. From clearance studies with dextran molecules of various sizes, it is known that the holes in the normal glomerular membrane are not all of equal size—all being permeable to molecules of molecular weight 5,000,

some 20% transmitting molecules of about 30,000 molecular weight, and very few being capable of transmitting molecules of 60,000–70,000 molecular weight. This state of affairs is apparently largely preserved in the uncomplicated nephrotic syndrome kidney, in that considerable selection is still exerted on the size of molecule which is transmitted. But there is enough "stretching" of many of the holes to permit increased filtration at any rate of the smaller plasma protein molecules such as albumin and α_1 -globulin. These

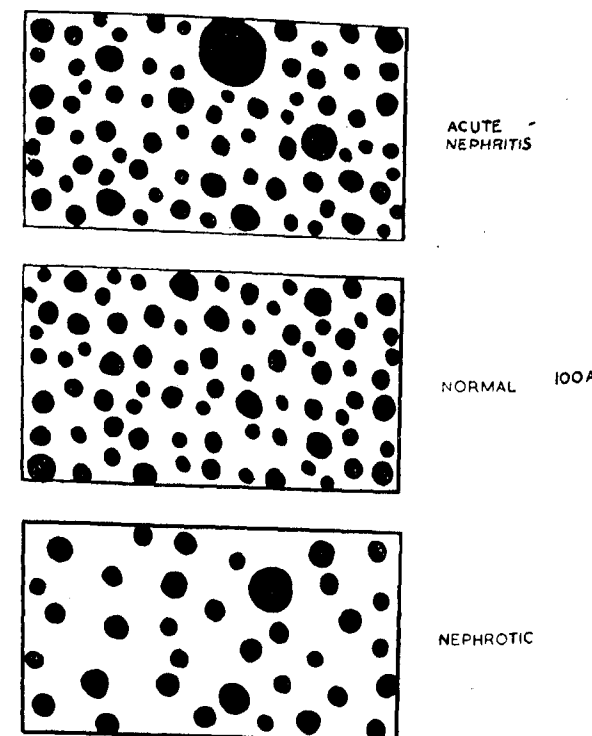


Fig. 8.—Possible glomerular membrane pore sizes as deduced from protein clearance studies. Normal: variations in pore size, but only occasional pores large enough to transmit protein. Acute nephritis: as normal, with occasional pores greatly enlarged. Nephrotic: many pores large enough to transmit smaller plasma proteins, only few transmit larger proteins. Reduced glomerular filtration rate may be associated with reduced numbers of pores.

variations in the size of hole in the glomerular sieve are illustrated diagrammatically in Fig. 8. Our findings in patients with subacute nephritis are intermediate between those described for acute nephritis and for the nephrotic syndrome.

Studies of Nitrogenous Metabolism

The patients in this series in whom proteinuria had been present for at least several months were grossly depleted in body protein. This feature of the nephrotic syndrome does not immediately attract attention for several reasons. The depletion develops insidiously, the muscular wasting is masked by oedema, and generally there is no marked loss of fat, so that the contours of the face, arms, and chest are not obviously abnormal. After loss or drainage of oedema, the calf muscles are often seen to be greatly reduced in bulk, and unequivocal evidence of protein depletion can be obtained by nitrogen-balance studies during convalescence. As an example, we have studied a girl of 19 (J. R.) who was severely affected with the nephrotic syndrome in July, 1952. Normally 55 kg. (8 st. 9 lb.) in weight, so much oedema was present by the end of October, 1952, that she weighed 87 kg. (13 st. 10 lb.), further increase being prevented only by repeated paracenteses. At this stage her appetite improved, and by December she was taking a diet containing more than 100 g. of protein each day. Daily nitrogen-balance studies were then carried out until her discharge from hospital 98 days later. During this period she gained over 3.6 kg. of protein (representing

with its associated water and minerals about 11 kg. of "flesh"). Since there was no slackening in this regain of body protein during the latter period of hospital treatment, and since the convalescence continued for several months after return home, this 11 kg. must represent only about two-thirds of the flesh lost at the height of illness, suggesting a maximum loss of 17 kg. In other words, a girl of 55 kg. normally (with no oedema) had wasted at the height of her illness to a person of (55–17 kg.)=38 kg., encumbered by (87–38 kg.)=49 kg. of oedema fluid. Now the normal body of a female of 55 kg. contains about 15% or 8 kg. of protein. This patient lost and regained at least half and probably nearly two-thirds of this total amount.

Much work has already been devoted to the study of nitrogenous metabolism in the nephrotic syndrome, Farr and MacFadyen's (1940) analysis of their findings in children being specially important. Nevertheless, it seemed worth while adding further studies. For the present, two findings are of interest—the nature and amounts of the nitrogenous metabolites found in the urine, and the effect of various levels of protein intake on these metabolites and on the nitrogen balance.

The daily output of urea is abnormally low in nephrotic syndrome patients of long standing. Whereas a normal person on an average English diet excretes each day about 25 g. of urea ($\equiv$ 11.7 g. of urea nitrogen), a severely affected nephrotic patient of similar size excretes only about 10 g. of urea daily ($\equiv$ 4.7 g. of urea nitrogen) on an equivalent food intake. This deficient output is not due to inability of the kidneys to excrete urea, for the urea output remains at this level for weeks or months without any progressive rise in blood urea concentration. As a practical consequence, simple urinary function tests based on specific gravity or urea content of early morning urines are unreliable in the nephrotic syndrome, especially as it can be shown that extra water taken by mouth does not produce a prompt diuresis in these patients, but tends to be excreted during a period spread over 24–48 hours. The low urea output in the nephrotic syndrome is a manifestation of the need to use all amino-acids derived from food so far as possible to synthesize new protein—especially the plasma proteins being lost in the urine. Even lower outputs of urea have been recorded in experiments when normal subjects have been maintained on diets containing little or no protein for long periods but otherwise adequate in calories and essential supplements. These normal subjects were, of course, sustaining the same continual loss of specialized protein in the urine. The 10 g. of urea being excreted each day by the nephrotic patient presumably represents the degradation product of certain amino-acids which cannot be used for plasma protein synthesis owing to relative deficiency of other essential components (probably other complex amino-acids).

While making daily measurements of nitrogen excretion by the nephrotic patient (J. R.), an unusually high difference or "gap" was found between the overall non-protein nitrogen values and the nitrogen present as urea + ammonia.

On the same 24-hour urine specimens, total osmolarity estimates disclosed an unusually large departure from the sum of estimated constituents. As these combined discrepancies led to a simple discovery, it seems worth describing the sequence in which they were noted.

In Fig. 9 is shown the Hill-Baldes thermo-electric device for measuring the total osmolarity of a solution. In principle it depends on the lowering of vapour pressure of dilute aqueous solutions in proportion to the number of dissolved particles (molecules such as urea or glucose, and ions such as sodium, sulphate, etc.). In use, the two loops shown are as loaded with a drop each of distilled water and urine, and then lowered into the thermostatically controlled chamber with walls lined with filter paper soaked in water. The condensation of minute amounts of water vapour on to itself,

and so becomes warmer. This continues for a few seconds until the urine is warm enough to have a vapour pressure equal to that of the water, when equilibrium is restored. This steady temperature difference between the loops, each of which is made up by a small manganin-constantan thermocouple, is measured directly on a specially sensitive galvanometer. The reading is directly proportional to the osmolar strength of the solution on the "urine" loop, so that only simple calibration of the instrument with three or four salt solutions of known strength is required.

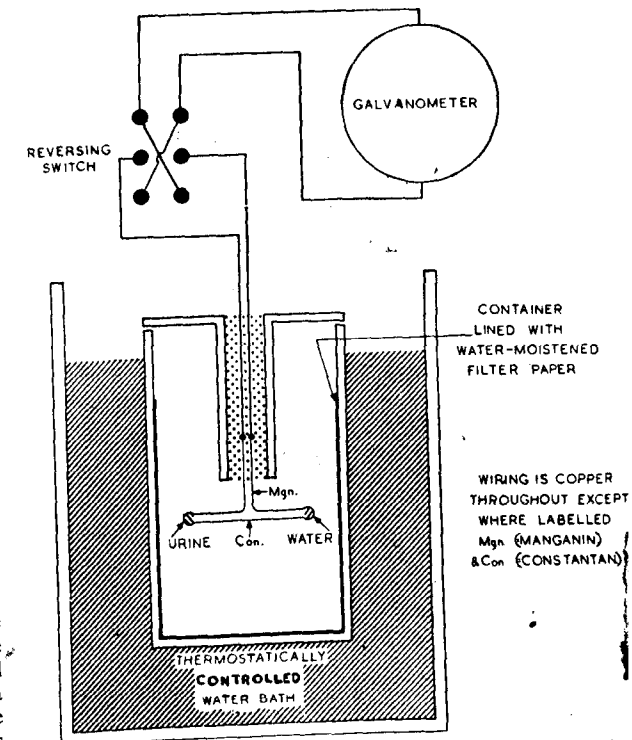


Fig. 9.—Thermo-electric apparatus for measuring total osmolarity, as described by Baldes and Johnson (1939). The loops loaded with urine and water settle to a steady temperature difference which is proportional to the osmolar strength of the urine, and is measured directly with the galvanometer.

In normal urine the main non-electrolyte is urea. Protein has a negligible effect on osmolarity, as such large molecular-weight substances consist of very few particles in solutions of the order of 1 g. or 2 g./100 ml. The electrolyte cations, sodium and potassium, are readily estimated with the flame photometer, and with ammonium, also readily estimated, constitute the main cations. The anions are more various, and in this study were approximately estimated as equivalent to the cations divided by a factor of 1.1, their usual average valency, for conversion from milliequivalents per litre into milliosmols per litre. In other words, the electrolyte strength in milliosmols due to cations + anions was calculated approximately from:

$$\text{(main cations)} \left(1 + \frac{1}{1.1}\right) \\ \text{or (main cations)} \times 1.9$$

This sum of (urea) + 1.9 (combined cations) was compared with the total osmolarity measured with the Hill-Baldes instrument, and in normal urine was only about 5% less—a gap which on rough calculation was not unsatisfactory in view of the various minor constituents (creatinine, uric acid, calcium, magnesium, etc.) not considered. In the urine specimen from the nephrotic patient, however, this osmolar gap was much greater, and was found to increase as convalescence advanced. Similarly, the nitrogen gap (non-protein nitrogen—urea + ammonia) increased. This is shown in Fig. 10b, the values obtained by the research worker in 24-hour samples of his own urines being shown

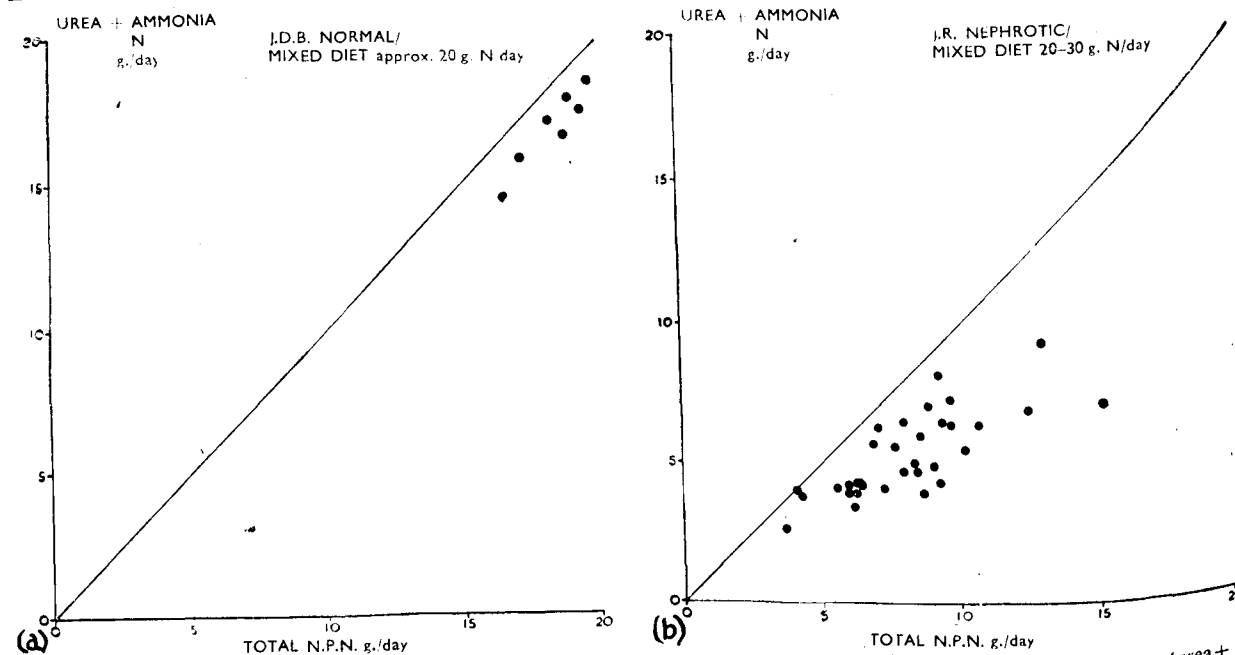


FIG. 10.—“Nitrogen gap” in 72-hour urine specimens between total non-protein nitrogen and its major component (urea + ammonia). The gap (represented by the horizontal distance between the observed points and the line) is small in the normal (a). This confirms other workers' findings with high- and low-protein diets (e.g., Folin, 1905; Deuel and others, 1927). In the nephrotic patient, J. R. (b), the gap is often considerable, especially with larger values of non-protein nitrogen excretion following high-protein feeding.

in Fig. 10a. In Fig. 11 the two forms of gap as found on three-day averages, week after week, are plotted against each other on log. log. scales. There is a considerable scatter, due no doubt in part to errors of estimation, in part to the assumption of a constant valency of 1.1 for the anion constituents of the urine. But the results are consistent with the true relation between the gaps being a straight line rising positively at an angle of 45 degrees. This implies that the two gaps are only separate measurements of the same unidentified constituent or group of constituents. The position of the line accords with molecules each containing between one and four atoms of nitrogen. At this stage amino-acids become suspect as the unanalysed constituents, and paper chromatography recorded their presence in large variety and amount. Nearly all the common amino-acid constituents of protein were found to be present. It may well seem that a rather

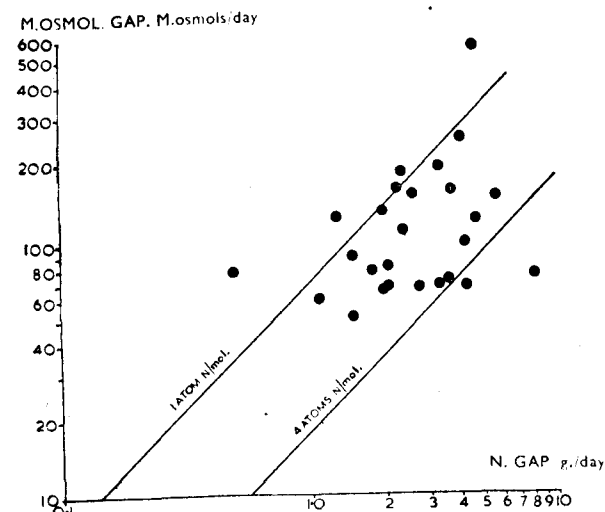


FIG. 11.—Relation between osmolar gap and nitrogen gap in nephrotic patient J. R. (72-hour specimens). Both values are plotted on similar logarithmic scales. The lines indicated show the values expected if the bulk of the unanalysed constituents contained 1 or 4 atoms of nitrogen/molecule—the range observed in 20/26 specimens.

long way round was taken to a simple discovery: the method has been detailed, as it seems to be generally applicable to the search for unknown constituents in the urine in a variety of diseases.

Testing other nephrotic patients for amino-aciduria has shown that its presence is not an isolated occurrence, but that it is not found in every case. In the patient already described, the quantity of amino-acids wasted in the urine was very considerable, increasing on the higher protein diets so that on intakes of about 150 g. of protein daily the equivalent of 20–30 g. was excreted as amino-acids. With severe proteinuria also present this patient was “wasting” about one-third of her protein intake. The amino-aciduria was apparently due to deficient tubular reabsorption resulting in a lowered renal threshold for amino-acids, as the blood amino-acid concentration was not raised above the normal.

Estimation of the nitrogen balance is probably the best criterion on which to choose an optimum diet. High-protein intakes have in the past sometimes been observed to result in increased proteinuria (see Berglund, Scriver, and Medes, 1935), but this is not necessarily a contraindication to their use if it reflects an increase in plasma proteins. Similarly, an increase in amino-aciduria merely seems to reflect an increased absorption of protein. By allowing a patient to take more protein in some balance periods than in others, it is possible to choose the optimum intake for maximum retention of nitrogen. In our studies with adults, the highest intake which we could persuade the patients to take (up to about 180 g. of protein a day in 60 kg. patients, or about 0.5 g. of protein nitrogen per kg.) gave the most strongly

TABLE V.—Effect of Varying Protein Intake on Nitrogen Excretion and Balance

	Normal On Protein Intake of:			Nephrotic On Protein Intake of:		
	0.2	0.3	0.4	0.2	0.3	0.4
Excretion of: Urea + ammonia Protein	0.19 0	0.29 0	0.39 0	0.09 0.06	0.09 0.06	1.10 0.06
Nitrogen balance	0	0	0	+0.04	+0.11	+0.18

All values expressed as g. nitrogen/kg./day.

positive balance results. Table V summarizes some typical findings. Whereas a normal person put on such a diet increases urea output in a few days and so balances the extra intake by a rise in nitrogen excretion, the nephrotic patient shows very little increase in urea output over periods lasting several weeks. Slowly, however, the urea output does rise somewhat, suggesting that after retention of large amounts of nitrogen the depleted reserves of body protein are restored to more normal levels, and the nitrogen metabolism of the nephrotic approaches that of the normal.

Prognosis and Treatment

Renal diseases associated with sustained hypertension, electrolyte disorders, or rises in blood urea or creatinine levels are known to have a poor prognosis. The outlook seems to be far better for uncomplicated examples of the nephrotic syndrome, especially now that intercurrent infection is so much more readily controlled by the use of antibiotics. These drugs also make reasonably safe the drainage of oedema fluid by paracentesis or Southey's tubes, procedures which may afford symptomatic relief to severely affected patients. Low-sodium diets delay the formation of oedema and, with dialysed milk or animal serum as supplements, can be maintained in conjunction with high levels of protein intake.

Measures aimed at directly raising the colloid osmotic pressure of the plasma seem to meet with varying success. Albumin transfusions (e.g., 50 g. in water) have only a transient diuretic effect, and some of the material administered is rapidly lost into the urine. Salt-free dextran infusions have been given to eight patients on two occasions each, under our observation, in six a similar transient response being observed. In two patients a more satisfactory result was obtained with the second infusion of 1,200 ml. 600 ml. having been administered seven days and ten days previously. Considerable saline diuresis lasting two weeks and three weeks ensued, both patients being entirely cleared of oedema. No relapse followed, the proteinuria diminished, and the chemistry of the plasma slowly reverted towards normal. Certainly, similar results have been obtained in the past with other remedies, gum acacia having been prominent at one period. A task of future research is to discover which patients or what stage of the illness is likely to respond in this fashion.

Gradual recovery may also follow a lengthy period of high-protein intake, diuresis occurring after some two months of positive nitrogen balance. Though the flood of diuresis seems to occur suddenly, a preceding trickle may be detected several weeks earlier in the form of an increased sodium chloride loss. It is possible that the very beneficial results sometimes obtained with colloids like dextran are obtained when patients are in this borderline state, so that, in effect, a hastened convalescence is achieved. In the present state of knowledge it is desirable to emphasize the need for maintaining nephrotic patients on a high-protein intake. Several reports from other centres have suggested that rapid recovery may follow the administration in high dosage of specific food constituents such as methionine or choline. In view of the large overall protein deficit commonly found, it seems very likely that some patients are especially deficient in sulphhydryl or labile methyl groups, but more work is needed to find out the relative frequency of general and specific forms of depletion.

Evidently gradual repair of renal defects, glomerular or tubular, can follow conservative treatment. If a drug could be found which reduced proteinuria without diminishing glomerular filtration of substances of smaller molecular weight, much more rapid recovery could be anticipated. Such effects have been claimed for A.C.T.H. and cortisone, though relapse may follow. Again, it seems that favourable results are not universally obtained. Our own experience with these drugs is too limited as yet for useful comment. In one patient an appreciable effect on proteinuria was not obtained with either drug, but cortisone appeared to con-

tribute to an increased appetite, making the institution of high-protein feeding practicable, and so indirectly leading to gradual recovery.

Theoretically, mercurial diuretics seem out of place in the treatment of patients already afflicted with severe proteinuria. In practice, they are used when other measures fail to remove oedema, and may enable a patient to carry on limited activities which would not otherwise be possible.

Summary

The nephrotic syndrome is characterized by oedema, proteinuria, and hypo-albuminaemia without certain signs of other forms of renal disease. Similar syndromes may also occur in association with other diseases.

A reduced colloid osmotic pressure seems to be the prime cause of oedema, and so of saline retention. Plasma volume is also reduced; it may rise and diuresis occur before the colloid osmotic pressure rises. Homeostasis of fluid volumes is discussed in relation to C.O.P. and interstitial gel swelling pressures.

With proteinuria and hypo-albuminaemia, other plasma constituents show characteristic alterations, the smaller-molecular-weight proteins tending to be reduced, the larger to be increased.

The amount of albuminuria is correlated with the degree of hypo-albuminaemia; albumin synthesis and utilization is discussed in relation to this finding.

The effect of albumin infusion on proteinuria can be used to assess glomerular permeability and tubular reabsorption of protein. The relative clearances of albumin and other plasma proteins differ in various types of disease and imply different disorders of glomerular permeability.

Nitrogen metabolism and balance studies contribute to an understanding of pathogenesis and treatment. Large deficits of body protein have been observed; low urea excretion values are found and interpreted partly as a manifestation of nitrogen conservation. Amino-aciduria of considerable extent may accompany the nephrotic syndrome, especially on high-protein intakes.

The prognosis of uncomplicated nephrotic cases is probably not as bad as is often thought. The achievement of a positive nitrogen balance by high-protein feeding is recommended.

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According to the World Health Organization's Expert Committee on Mental Health the following should be the essential characteristics of the modern psychiatric hospital : (1) The hospital should be designed by a town planner on the model of a small village in which patients should be placed in groups of not more than 10. (2) A hostess endowed with intelligence and an attractive personality should receive the patients. (3) The personality of the patient should be respected ; he should be considered as a sick person like any other sick person, worthy of trust and capable of responsibility and initiative. (4) The psychiatric nurse should be a specialist technician and should not be obliged to attend more than three to six patients. (5) Patients should be encouraged to form themselves into clubs (sports clubs, holiday clubs). (6) Patients who are on the way to recovery should be helped in the renewal of their relations with the community by being accorded leave of absence, or by employment. (*W.H.O. Technical Report Series, No. 73.*)

THE CLINICAL SPECTRUM OF OBESITY*

BY

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My contribution to this discussion is an attempt to survey the clinical field of obesity in the light of recent knowledge. The underlying point of view is that appetite plays the fundamental part and that, although endocrine factors are capable of causing changes in weight based on internal rearrangements of protein and fat, the usual reason for gain of weight is an excess of calorie intake over expenditure.

Experimental Obesity

Probably the most important recent contribution has been the direct production of experimental obesity by damage to certain nuclei in the medial hypothalamus, which has been shown by several workers and confirmed for several species of animals (Hetherington and Ranson, 1939; Brobeck, 1946). The essential feature of this obesity is that it is based on an enormous increase in appetite, and the close dependence of appetite on hypothalamic function has been further demonstrated by the discovery of lateral nuclei, destruction of which leads to total loss of appetite. In fact, it is possible to make an animal obese by first destroying the medial hypothalamic nuclei, and then to convert this into a fatal anorexia by subsequent destruction of the lateral nuclei (Anand and Brobeck, 1951a, 1951b). Clinically, this is reminiscent of the fat girl who subsequently develops anorexia nervosa, which, unless treated, may prove fatal.

The course of the increased appetite and consequent obesity in animals with hypothalamic damage is of great interest. Immediately after operation the appetite is voracious and indiscriminate, so that a rat may double or even treble its previous intake, and the gain of weight is very rapid. Both the appetite and the rate of gain then gradually decrease until a plateau is reached, on which extra weight can be maintained on a diet not significantly greater than normal. If these animals are starved and their weight is reduced they immediately return to their previous high level when allowed to refeed. In such animals fat may account for as much as 70% of their total weight, and water retention plays no part. Their appetite is now more capricious, and in this they appear to resemble both older rats and those that are naturally fat (Kennedy, 1950).

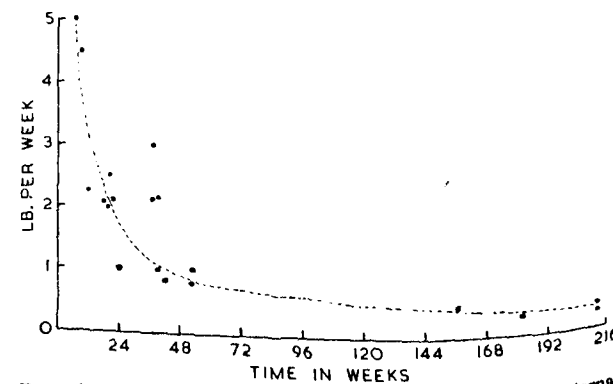
Maternal Obesity

These experimental findings may well have a direct application to some forms of human obesity, and indeed clinical study of maternal obesity shows so close a parallel to the experimental condition that there must be factors in common. The agreement covers the initial stage of voracious appetite, the plateau stage, and the amount of final gain achieved.

As clinicians we have undoubtedly been too ready to accept fat people as they are without a close inquiry into the rate of onset of the condition. The case literature is in fact extremely meagre on this point. It is, of course, difficult to obtain accurate information concerning weights in relation to time in the past, but individual accuracy can to some extent be replaced by multiple case histories, and in 80 cases of maternal obesity I have been able to collect 19 records of weight gain over different but definite periods (see Chart). It is remarkable how the rates of gain of these different women appear to be following a common path. They were all women whose gain of weight began after the birth of a baby, and the available information consisted of

*Read at a Plenary Session at the Annual Meeting of the British Medical Association, Cardiff, 1953.

a weight record taken during the puerperium and a subsequent record at a known but haphazard interval of time, which of course varied from patient to patient. It will be obvious that the general picture bears a close resemblance to that which has just been described in rats after hypothalamic damage; the gain of weight may begin with the same dramatic rapidity and then gradually tail off until a more or less steady state is reached, which in the case of these patients appeared to take about a year. Subsequent gain, if present at all, is extremely slow.



Records of weight gain (pounds per week) in cases of maternal obesity.

Thus, a woman had her baby in January, 1940, and weighed 133 lb. (60.3 kg.); in April, 1940, she weighed 168 lb. (76.2 kg.)—a gain of 35 lb. (15.9 kg.) in approximately 16 weeks, or a little more than 2 lb. (about 1 kg.) a week. She then refused to face the scales until April, 1944, when she weighed 218 lb. (98.9 kg.) so that in the interval she had gained 50 lb. (22.7 kg.) in some 208 weeks—less than $\frac{1}{4}$ lb. (0.11 kg.) a week. Over the whole period, however, she had gained 85 lb. (38.6 kg.) in 224 weeks, approximately 0.4 lb. (0.17 kg.) a week.

Development of Obesity

When one discovers that other individuals, who knew their weights only at the beginning and the end of a similar period of years, had not only experienced the same average rate of gain but also said that they remembered having put on weight very rapidly to begin with, one cannot help surmising that they may have followed a similar course. There is no doubt that some fat people have gained their weight slowly and steadily, but there are others who do so with a great initial rapidity which tends subsequently to be forgotten, and I would plead for more extensive studies of the actual rate of development of obesity. Not only does the rate of increase in these cases of maternal obesity parallel the experimental one, but in the very few cases that I have been able to see I have satisfied myself that the period of rapid gain was accompanied by an excess appetite.

Thus one woman who was gaining at a rate of slightly more than 3 lb. (1.36 kg.) a week not only ate her full ordinary meals with second helpings but also consumed sweets and raided the larder during the intervals. This is common enough, but when in addition it was found that after partaking of a special supper immediately before retiring she also took food to bed with her knowing that she would wake up ravenous in the night, and then required her husband to bring up bread and cheese with the morning cup of tea, one is justified in ascribing the gain of weight to a voracious appetite. It is of interest that she herself refused with some anger any suggestion that she was overeating, as she never had "more than her fill," and in response to later questioning would undoubtedly have denied any excess intake—for the patient is apt to deal with questions on this point as if the implied an accusation of greed.

When the rate of gain is at its steepest hunger seems to arise immediately after a meal and there is no feeling of satiety, however much has been eaten. As the rate slows off the intervals before hunger reappears seem to lengthen the progression being from "I'm never satisfied" to "get hungry again an hour after a good meal," and so on. It is as if a satiety mechanism which is nil at the start gradually increases as the weight approaches a target already set

Calorie Intake

When the woman has reached a plateau in which either the added weight is steady or is subject at the most to a very slow increase, clinical observation shows quite clearly that many of them are not taking an excessive diet (Sheldon, 1949) and that, in their own words, they "do not deserve to be fat"—which agrees with the experimental findings (Kennedy, 1950). Their eating habits are often unusual; they may cut out some meals altogether—usually breakfast—and depend on one or two very large meals, and many of them admit to an almost irresistible appetite in the presence of articles of food for which they have a partiality. In their study of actual diets consumed Widdowson and McCance (1936) found no significant correlation between body weight and calorie intake, and we should remember that fat individuals may very well not deserve to be fat in the light of their present intake, but they have undoubtedly at some time in the past deserved to become fat, and may since have been able to maintain their added weight on a reasonable intake. Since their basal metabolism is normal, and this is calculated on a bigger surface area, the only way they can achieve this result is by a diminution in activity. This has been shown to occur in the experimental animal (Brobeck, 1946), and, although it is virtually impossible to demonstrate clinically, yet I think that general observation suggests it may be true.

Since the final gain achieved may be as much as 150% of the original weight, simple calculation shows that some 60% of the total weight would be due to fat, and this again is in keeping with the experimental findings.

Hypothalamic Regulation

The general concordance between experimental obesity produced by hypothalamic damage and the clinical findings in maternal obesity is so close that one must assume a hypothalamic mechanism to be concerned in the latter, and, if so, its possible role in other types of human obesity has to be considered. The cases in which obesity develops after inflammation of or injury to the lower brain, as an occasional complication to encephalitis or chorea and to a fractional base or subarachnoid haemorrhage, would seem to be the direct human equivalent of the experimental damage. The interesting syndrome of periodic somnolence and morbid hunger (Kleine-Levin) is also a close analogue and serves as a link with those instances which are to be associated with alterations in hypothalamic function rather than with actual structural damage. In view of their close functional relations, one naturally looks to the cortex as one possible source of such alterations in hypothalamic function, and clinical experience does indeed reveal several types of obesity in which a cortical factor must be assumed. The obesity which sometimes follows frontal leucotomy undoubtedly belongs to this group, as also does the increased appetite which is well known to occur in some people in response to emotional states (Shorvon and Richardson, 1949). One wonders also whether the well-known gain of weight that follows abstinence from tobacco may not have a similar origin.

It is an interesting commentary on the difficulties of clinical medicine that an obesity of apparent emotional origin may often arise in the midst of a disturbed endocrine background. Bruch (1940) has shown that fat children are apt to have an emotional tension which is eased by the taking of food, and at the same time their bone growth is in advance of their age—which may, nevertheless, be a derivative from rather than antecedent to the increased intake. Maternal obesity begins immediately after the birth of the baby, when there is a considerable endocrine stress associated with the establishment of lactation. When such obesity occurs in the first and only pregnancy or in the last pregnancy, boy babies are no fewer than four times as common as girl babies, and one cannot avoid the speculation that it is the appearance of the male infant which has released an emotional state in the mother, leading in turn to the increase of appetite.

Other Types of Obesity

The types of obesity already mentioned are, of course, only a part of the whole clinical spectrum, and an application of the same point of view to other forms is not immediately obvious. They are characterized essentially by the fact that the obesity presents itself to the clinician in company with other features which imply an abnormal endocrine state, and in the latter it is natural to seek for an explanation of the former. This may be hazardous, for we have as yet no full understanding of the many factors involved in the established state of overnutrition. It is, of course, well known that insulin is involved and that obesity leads to hypertrophy of the islet tissue, but the endocrine adaptations are certainly complex, and probably involve both the anterior pituitary and the adrenal cortex in addition. When clinical evidence of ostensible endocrine derangements therefore are found to accompany obesity, it is well to remember that they may derive from rather than be causative of the obesity. Neglect of this aspect led to the mistaken view, held for many years in many quarters, that patients with anorexia nervosa were suffering from an organic hypopituitarism—a warning that should make one cautious.

Nevertheless, it is true in general to say that obesity tends to arise at three periods—growth and puberty, maternity, and the menopause—all of which have in common an endocrine departure from a relatively static state. It would be interesting to know more about the menopausal middle-age spread than we do. Accurate information is curiously lacking at a minimum, and there is certainly here an untapped field of clinical observation. One's general impression is that the gain is a slow one, which suggests that it may be due to a continuance of previous dietary habits at a time when energy expenditure has become somewhat less.

Relation to Growth Factor

The obesity which is so common an accompaniment of late adolescence in association with growth and puberty has been more closely studied, although the occasional excesses have proved more congenial than the normal development of "puppy fat," which never gets to the doctor at all. The work of Young (1951) on the relation of obesity to growth factor of the anterior pituitary may well be relevant here. In dogs the hormone causes a deposition of protein accompanied by an increased catabolism of fat. If the diet be controlled the animal can gain weight on a diet that previously only kept the weight static, owing to the different calorie values of protein and fat. The normal animal, however, does not keep his intake steady, but responds by a great increase of appetite, and this may be so big that the excess fat laid down more than compensates for the energy lost to the body by growth. The appetite response is, in fact, a coarse one and leads to the taking in at this time of life of an unnecessarily large calorie total—an experimental observation which would appear to be in harmony with both the insatiable appetite and the "puppy fat," which are so common in adolescence.

The effect of growth hormone has also been invoked as an explanation of maternal obesity. It is a well-established observation that women who develop diabetes in middle life are apt to have given birth to larger babies than non-diabetic women, and these women are also often obese; it has been suggested that overproduction of growth hormone has led to the large baby and, in the course of time, to the appearance of diabetes.

Nevertheless a general clinical review of these two types of obesity suggests that even at these epochs it is unlikely to be the only factor, for if growth factor were the sole agent one would justifiably expect the extreme cases to show clinical appearances tending towards gigantism or acromegaly. It is a remarkable fact that, on the contrary, these are conspicuous by their absence, and where there is evidence of endocrine excess in the obesities of growth or maternity the clinical appearances are those associated with abnormal function of the adrenal cortex. Thus striae distensae are very common, and I am in complete agreement with Simp-

son (1950, 1951) in the stress he lays on their importance. Although they can appear in diverse clinical states, the available evidence suggests that they derive from an altered or excessive adrenal steroid metabolism, and they can certainly occur in the course of treatment with A.C.T.H. Simpson (1951) has described some of these cases of pubertal obesity under the names of adipose gynism and adipose gynandrium, and there is no doubt that they constitute a definite clinical picture which we have all seen, although Le Marquand (1951) may well be right in regarding them as extremes of the continuous spectrum of childhood obesity rather than as isolated entities. However this may be, it would appear to be impossible to understand them without regard to the adrenal cortex, and the same applies to maternal obesity, for when endocrine abnormalities occur in these women their trend is always in the direction of a Cushing syndrome and never in that of acromegaly. Indeed, pregnancy is a well-recognized precursor of the Cushing syndrome.

Our present knowledge, however, does not enable us to go much farther than the general statement that the adrenal cortex is undoubtedly concerned in the mechanism of obesity. Apart from the possibility that it may affect the site of the deposition of fat, and that Kendall's compound A (11-hydroxycorticosterone) and compound B (corticosterone) may cause a decrease in weight accompanied by an increase in the percentage of fat, there is some clinical evidence that the gland may have a direct effect on appetite, and, if so, this may provide a link with what has already been said concerning the hypothalamus. It is well known that the use of both cortisone and A.C.T.H. may occasionally be accompanied by a marked increase of appetite and gain of weight; in my experience this is particularly true of A.C.T.H., and I well remember one child, given it for nephrosis, who immediately developed an appetite so insatiable that it was like that described for rats after hypothalamic damage; for if food were not at hand she would consume her chalks, and so long as food was available she would go on eating. Simpson (1952) has described the case of a child with a tumour of the adrenal cortex who developed a similar appetite with resultant obesity. The link between the adrenal cortex and such appetite is still a mystery.

We have no understanding of how the hypothalamic regulation of appetite is itself controlled, but Kennedy (1953) has suggested that hypothalamic damage leads to an increased appetite by interference with the satiety mechanism, which may normally be actuated by a sensitivity in the appropriate hypothalamic cells to metabolites in the blood stream. No single metabolite has been proved to be capable of exerting this control, though glucose has been suggested. One cannot avoid the speculation that adrenal steroids may influence appetite by a direct effect on the hypothalamic cells concerned, and that an excess of certain steroids may provide the hypothalamus with entirely false information, causing it to legislate for a state of need in the presence of a state of plenty. For this is essentially what happens when the hypothalamus is injured or a child with an adrenal cortical tumour develops an insatiable appetite.

Speculation is hazardous; nevertheless it seems fitting to end on such a note, for the problem of obesity has not yet disclosed all its secrets.

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ASSESSMENT AND RESULTS OF OBESITY*

BY

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For my purpose I shall define obesity as the condition in which the amount of body fat is greater than normal: the tiresome question of normality I have discussed at length elsewhere (Sinclair, 1948). The term "overweight" merely means that the body weight is greater than normal, having regard to such factors as race, sex, somatotype, height, and age.

Assessment of Obesity

A common but highly erroneous method is to obtain the weight and height of a person and compare the former with so-called standards of weight for given sex, age (if not adult), and height. The basis of the standards is seldom considered. When nutritional surveys were conducted in Germany for the Control Commission immediately after the war considerable attention was paid to body weight, and especially to longitudinal studies of body weight in individuals. Some 100,000 persons in a wide variety of categories were weighed monthly, and these weights were compared by the Hollerith method with the previous weights; unfortunately the Control Commission had these monumental results pulped in a moment of lightheartedness. Such longitudinal studies on single individuals are very valuable, although it must be remembered that undernourished persons may adapt by doing less work, thereby conserving their body weight, and that extracellular fluid may increase and mask a decrease in the weight of the fat and tissues. But a single estimate of body weight in cross-sectional studies did not give much information.

The standard tables available were those of Hassing-Schall; it was very difficult to discover their origin, which in fact proved to be unimpressive. Since the standards were much higher than those in the use of the U.S. Army, it was not surprising that Germans appeared in many cases to have lost a considerable amount of weight, and the possibility that Hassing's subjects were obese had not been considered. Further, his male figures (Brugsch, 1922) contained the common error of being the average or arithmetic mean of a large number of observations (his female figures were obtained by subtracting an arbitrary 0.89 from the male figures): since body weights are not normally distributed about the mean but are skewed to the right, the average weight of a group of persons is more than the centre of the distribution (or mode).

A very important variable in considering the assessment of obesity from overweight is the somatotype. As W. H. Sheldon (1940) has shown, every person has a greater or less degree of endomorphy, mesomorphy, and ectomorphy. Those persons in whom one or other of the first two predominates will tend to be overweight. The endomorph will tend to be overweight. The endomorph has excessive fat, and his overweight indicates obesity; but the mesomorph has large muscles and bones, though he may not be tall, and the amount of fat is not necessarily excessive. Indeed, a mesomorph

*Read at a Plenary Session at the Annual Meeting of the British Medical Association, Cardiff, 1953.

such as 163 would normally weigh much more and have much less body fat than an ectomorph such as 425 of the same height. So the measurement of body weight will not necessarily tell us much about obesity.

Methods of Measuring Body Fat

The easiest way of estimating the amount of fat in the body is to measure the amount in the subcutaneous tissue, where about half the total is located. This method has been used by clinicians for a long time. Quantitative studies have been made since the end of the last century; sometimes one site has been used, but Edwards (1950) tried 93 points and site has been selected 53. In wartime studies in England, and subsequently in the famine in the Netherlands and in post-war Germany, we used a simple form of calliper and two sites—over the top of the biceps and midway down the back of the forearm. It was found that there was a correlation between the thickness of subcutaneous tissue and relative weight (as judged from standards for given sex, age, and height) of the order of 0.5; this, though highly significant and indicating that fat persons tend to be overweight, does not mean that overweight is necessarily an accurate measure of obesity. The measurement of subcutaneous fat from soft-tissue x-ray films (Stuart, Hill, and Shaw, 1940; Reynolds and Asakawa, 1948) does not seem to have any advantage over that of skin-fold thickness.

Professor McCance has mentioned methods of determining the composition of the body. The most accurate way of measuring the total body fat is by determining the density of the whole body (Kohlrausch, 1930; Behnke, 1942; Rathbun and Pace, 1945; Keys, 1953). Keys (1950), in a study of young and middle-aged men, found a correlation between abdominal skin-fold and relative weight of 0.475 (similar to our correlation); but the correlation between density and relative weight was only -0.24, indicating again that overweight does not necessarily afford a good index of obesity. His correlations between abdominal skin-fold and density were -0.84 for the young men and -0.60 for the middle-aged men (Keys, 1953), so we may reasonably be content to measure obesity by the thickness of subcutaneous tissue.

Assessment of Obesity in Children

The assessment of obesity in children is more complicated. There are two well-known spurts in growth that do not necessarily occur at the same ages, and the problem of what is normal growth is difficult to solve; further, the distribution of subcutaneous fat varies with age. There has been a tendency to regard maximum growth of children as the optimum. In lower animals it has been shown by various workers that overnourishment during growth leads to early maturity and a shortened life-span. A characteristic of the genus *Homo* is the relatively long time taken to shorten maturity; there is no evidence that it is desirable that it is this period of development and some evidence that it is harmful. Some children appear to put on weight much more readily than others, and endocrine glands are often blamed. We may perhaps agree with Rynearson, who is co-author of an excellent book on obesity (Rynearson and Gastineau, 1949), that "the only glands involved in obesity are the salivary glands"; yet some facts are not easily explained. For instance, Peckos (1953) claimed to have found that endomorphic children ate less than ectomorphic; but her dietary methods are not beyond criticism. It is a common observation that some endomorphs, whether children or adults, appear to eat relatively little and yet gain weight, whereas some ectomorphs appear to remain thin on large calorie intakes. The matter requires careful investigation. It must be remembered that endomorphs have relatively less surface exposed and therefore lose less heat, and they tend to be less active with slower movements and fewer gestures than the "lean and hungry" ectomorph; on the other hand, more work is done by the endomorph for a given movement.

Effects of Obesity

If obesity were unimportant there would be little need to measure it. Apart from mechanical inefficiency and aesthetic undesirability, it is the cause of disease and premature death. It is somewhat trite to mention that a person who is 40 lb. (18 kg.) overweight carries around an extra 40 lb.; this means that extra energy is expended, extra food is eaten, and there is some muscular hypertrophy (Keys, 1953). There is an increased incidence of degenerative arthritis of the lumbar spine, hips, and knees (Harmon, 1942; Danowski and Winkler, 1944; Faust, 1946), and of hernias, varicose veins (Dublin, Fisk, and Kopf, 1925), and fractures (Coombs, 1936); accidents are more frequent, presumably because the obese are slower in their movements and clumsy (Dublin and Marks, 1930). The postural changes cause respiratory and circulatory inefficiency, with emphysema (Kerr and Lagen, 1936) and decreased vital capacity (Short and Johnson, 1939).

The careful statistics presented by Dublin and his colleagues of the Metropolitan Life Insurance Company, New York (Dublin and Marks, 1930; Armstrong, Dublin, Wheatley, and Marks, 1951), have shown that at all ages men and women who are overweight have a higher mortality than the average; and the greater the degree of obesity the greater the mortality. Obese men had higher death rates from degenerative cardiovascular and renal diseases, diabetes mellitus, and cirrhosis of the liver; obese women had relatively the greatest excess mortality from diabetes mellitus and diseases of the gall-bladder, especially gallstones. The mortality is relatively worst among those under 45; among both men and women the number of observed deaths from degenerative diseases of the circulatory system and kidneys is 70% more than the expected, and it is at least double the expected among those under 45 (Armstrong *et al.*, 1951). In the course of pregnancy and childbirth obesity is a hazard; there is a greater frequency of complications, deaths, toxemia, and large babies (Matthews and Der Brucke, 1938; Odell and Mengert, 1945; J. H. Sheldon, 1949; Gilbert, 1949).

Biochemical Aspects

I wish to mention in particular two conditions—diabetes mellitus and atherosclerosis—in which there is an increased formation of cholesterol, and to make a few brief remarks about biochemical aspects. According to Joslin, obesity is a forerunner of diabetes from middle life onwards in fully 90% of the cases, and only 5% are underweight before the

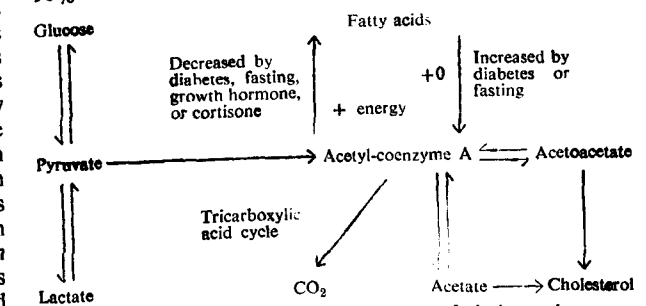


Chart showing process of formation of cholesterol.

onset (Joslin, Root, White, and Markle, 1940). Further, after the age of 40 the mortality from diabetes among overweight women insured at substandard rates was eight times as high as that of average or underweight women. There are two distinct biochemical mechanisms to be considered.

First, fatty acids are formed in cells from 2-carbon ("active acetate") fragments arising from pyruvate and hence from glucose, or from other sources such as oxidation of fatty acids. Though insulin promotes the synthesis of fatty acids, probably by making energy available within the liver cells for this synthesis, it is known not to be essential: liver slices from depancreatized cats will

convert C^{14} -labelled acetate into fat at a normal rate if the hypophysis is removed (Brady, Lukens, and Gurin, 1951). These workers also found that pituitary growth hormone or cortisone decreases the synthesis of fat, and in the intact animal growth hormone or A.C.T.H. depresses the synthesis (Welt and Wilhelmi, 1950). But the reverse process—the breakdown of fatty acids into 2-carbon fragments—is increased in diabetes as it is in fasting, and from these fragments acetoacetic acid and hence cholesterol are formed (Brady and Gurin, 1951); this accounts for the ketosis and hypercholesterolaemia of diabetes. It in no way accounts for the association of obesity with diabetes; indeed, if there is decreased formation of fat from carbohydrate and increased oxidation of fat one might be tempted to expect diabetics to be thin.

Dr. Meiklejohn has suggested that chronic excessive output of insulin by the islets of Langerhans might produce obesity and lead eventually to failure and atrophy of the islets, with resulting diabetes. But the characteristic middle-aged obese diabetic belongs to the insulin-resistant type and shows no atrophy of the islets after death. When we cannot explain a mechanism in man it is useful to turn to rats and mice. This has been done with success by Jean Mayer, of Harvard, who has studied obese patients and hereditarily obese mice (Mayer, 1952). He believes that appetite is conditioned by the effective blood-glucose level, or the amount of sugar that can pass into and be used by cerebral cells in unit time. Food intake is regulated to keep the effective blood sugar constant.

The inheritance of obesity in the mice is a Mendelian recessive; the adult animals weigh up to three to four times the normal, they become diabetic by the ninth or tenth week of life, and they die prematurely with very much enlarged islets of Langerhans. The diabetes is characterized by a high degree of insulin resistance, and it is caused by a blocking by pituitary growth hormone of the action of hexokinase upon glucose. In the pre-diabetic phase in these animals, as in hypothalamic obesity, increased lipogenesis causes overeating; in the diabetic phase, the blood glucose is raised but the impaired phosphorylation of glucose keeps the "effective" blood glucose from increasing correspondingly. Mayer concludes that there is a suggestive analogy between the obesity-diabetes syndrome in mice and the insulin-resistant diabetes often encountered in obese individuals. The obese diabetic mice, like insulin-resistant middle-aged obese diabetics, have hypercholesterolaemia, and it remains to consider the relation of overweight to cholesterol metabolism and atherosclerosis.

Correlation between Obesity and Atherosclerosis

The agreed facts about obesity and atherosclerosis seem to be as follows. There is a correlation between overweight and hyperpiesis: for instance, a study of 74,000 industrial workers showed at every age and in both sexes a steady progression in both systolic and diastolic pressures with increase in body weight for height (Master, Dublin, and Marks, 1950); at necropsy, advanced atherosclerosis is much commoner in the overweight (Wilens, 1947). The development of atherosclerosis is related to the serum cholesterol level (Davis, Stern, and Lesnick, 1937; Keys, 1951a; Katz, 1952). In general, there is a steady increase in the mean serum cholesterol level of well-fed men from adult age to the mid-50s, the average annual increment being about 2 mg. per 100 ml. (Keys, Fidanza, Scardi, and Bergami, 1952). There is no relation between the serum cholesterol level and the habitual dietary intake of cholesterol (Keys, 1949; Gertler, Garn, and White, 1950), but the serum cholesterol level is altered by substantial changes in the dietary fat (Keys, Mickelsen, Miller, and Chapman, 1950; Hildreth, Mellinkoff, Blair, and Hildreth, 1951). There is a correlation between the concentrations in serum of cholesterol and of Gofman's lipoprotein molecules (Keys, 1951b). Therefore Keys, whom we were fortunate to have working with us for a year in Oxford recently,

has been led to suggest that increased dietary fat raises serum cholesterol and produces atherosclerosis: since increased dietary fat will tend to cause obesity it is not surprising that atherosclerosis is commoner in overweight persons.

In many of these studies it is important to avoid the *post hoc* fallacy and the danger of confusing the cart with the horse. Because degenerative arthritis is commoner in the obese, we cannot necessarily conclude that obesity causes it: it might be maintained that arthritis limits movement and so causes obesity. Perhaps arteriosclerosis diminishes the blood supply of the hypothalamus and thereby increases appetite, with consequent obesity. In this connexion the recent work of Dublin (1953) is pertinent: he has shown that there is a substantial lowering of mortality amongst overweight persons who reduce their weight, and various disorders that are commoner in the obese can be diminished by slimming.

Ninety years ago William Banting (1863) began his *Letter on Corpulence* with the following words: "Of all the parasites that affect humanity I do not know of, nor can I imagine, any more distressing than that of obesity, and, having just emerged from a very long probation in this affliction, I am desirous of circulating my humble knowledge and experience for the benefit of my fellow man, with an earnest hope it may lead to the same comfort and happiness I now feel under the extraordinary change,—which might almost be termed miraculous had it not been accomplished by the most simple common-sense means." We know that obesity is very common, causes discomfort and ill-health and early death, and can be corrected by simple common sense. Since it also represents a waste of food, renders its subjects more prone to accidents, and can be measured, perhaps the Welfare State will consider taxing it.

Summary

Overweight and obesity are not synonymous. The estimation of obesity by comparing the weight of a person with standards of weight for given sex, age (if not adult), and height is often fallacious for several reasons: first, the basis of the standard is often doubtful; secondly, body weights are skewed and the average weight in a group is higher than the central weight; thirdly, somatotype is very important, since mesomorphs (muscular persons) may be heavier than endomorphs (fat persons) of the same height, and yet have much less body fat.

Obesity is satisfactorily estimated by measuring the thickness of a skin-fold. This correlates highly with the density of the body.

Overweight is particularly difficult to estimate in children because of the two characteristic growth-spurts and because there is doubt about what represents optimum nutriture: the maximum rate of growth is not the optimum, since overnourishment causes early maturity and probably early death.

Obesity shortens life and is accompanied by an increased incidence of accidents and of various disorders, including atherosclerosis, hyperpiesis, diabetes mellitus, chronic nephritis, arthritis, gall-stones, and complications of pregnancy and childbirth.

Hereditarily obese mice have increased lipogenesis, with consequent overeating; they are analogous to patients with hypothalamic obesity. Later they develop diabetes and are analogous to the middle-aged obese insulin-resistant diabetic.

Increased dietary fat (but not increased dietary cholesterol) tends to raise the serum cholesterol level and to produce atherosclerosis.

Reduction of body weight lowers mortality in overweight persons, and various disorders that are commoner in the obese can be diminished by slimming.

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"Health in Hot Countries" is the title of a British Council study booklet, edited and introduced by Professor J. M. Mackintosh. It is based on a series of broadcasts given in the Overseas Service of the B.B.C., and is intended for the use of medical and auxiliary staff training for public health work. The booklet presents British Commonwealth experience and achievement in the field of tropical medicine. The opening chapter by Professor G. Macdonald, director of the Ross Institute of Tropical Hygiene, is concerned with the collection and interpretation of community health statistics. Then follows a chapter by the professor of physiology at Khartoum, Professor Dean Smith, on nutrition and health, which discusses the causes of malnutrition and their conquest. Dr. C. G. Pandit, secretary of the Medical Research Council for India, contributes a chapter on tropical diseases, in which he gives a brief account of the treatment of malaria, plague, filariasis, kala-azar, and leprosy. The health services of Pakistan and Nigeria are the subject of the fourth chapter, the former being described by Lieutenant-Colonel Muhammed Jafar, director-general of health for Pakistan, and the latter by Dr. Oladéle Ajose, professor of preventive and social medicine at Ibadan. Finally there is a chapter on "health engineering," written by Mr. J. W. Wright, a sanitary engineer, and Dr. J. A. Logan, director of medicine and public health, the Rockefeller Foundation, London. This chapter deals with the control of the environment and the vital problem of enlisting local co-operation in such work.

THE MAYLARD-SONNENBURG METHOD OF INTESTINAL ANASTOMOSIS

BY

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In 1951 Kimbarovskij proposed "a new method of anastomosis of the small and large intestine." We believe that this method was devised and practised many years ago by Professor Sonnenburg, of Berlin, possibly in the late 'nineties, as told to us in a personal communication by the late W. D. Macfarlane, who was with Sonnenburg at that time.

Unaware of Sonnenburg's work, Maylard (1913) practised and developed the technique independently in Glasgow in the early part of the present century, probably about 1910. He introduced the method on account of its simplicity, safety, rapidity of execution, and immunity from leakage at the line of suture. The possibility of the establishment of a valve action comparable to the ileo-caecal valve of Taenius was regarded as a physiological possibility. Early sealing of the suture line was anticipated. His views were confirmed by post-mortem examinations. He found, in a patient who died of cardiac complications, that as early as six hours after operation the line of junction was sealed, no leakage had occurred, and regenerative processes had already begun.

His interest in this form of anastomosis was originally aroused by the difficulty he had experienced in dealing with faecal fistulae, especially those associated with the caecum and lower third of the ileum. He extended its use to cases in which he hoped to perform a partial or complete colectomy at a later date. In cases where there was an irremovable colonic tumour he performed an ileo-colic anastomosis in preference to any type of colostomy. He preferred it to a lateral or end-to-side anastomosis, the main reason being that by this method the possibility of leakage was substantially reduced.

With the exception of Bickham (1924), who gave a relatively accurate description of the method, no one appears to have described the technique.

The method is applicable to any condition in which the receiving tube is of greater calibre than the entering one. It may be practised as the first stage to colectomy, the colon being removed either in part or as a whole at a subsequent operation. It has been found useful in the treatment of ileo-caecal fistula, where it is necessary to re-route the intestinal flow from the ileo-caecal junction, as also in the treatment of obstruction of the alimentary canal proximal to the pelvic colon. It may be employed with advantage as a preliminary to subsequent operative procedures.

Principles

Technical simplicity, speed in execution, and immunity from peritoneal contamination owing to rapid sealing of the cut edges are the special attributes of this method. The

passage of the intestinal contents helps to tighten the union rather than to strain it. One row of sutures only being necessary, the amount of foreign material introduced is lessened. Only one, or at the most two, clamps are required; therefore tissue trauma is kept to a minimum and interference with the normal peristaltic action largely eliminated. The valve action tends to prevent regurgitation of the intestinal contents, and thus diminishes the incidence of post-operative complications.

Da-Costa (1931) states that at least 250 methods of intestinal anastomosis have been described, and he gives the essentials of a good method as one which can be speedily performed, which leaves an even and reliable line of suture, which avoids a considerable permanent septum, and which reduces to a minimum the use of mechanical contrivances. It is hoped to show that the Sonnenburg-Maylard method fulfils these requirements.

Technique of Operation

Maylard's *métier* was abdominal surgery, and he is rightly regarded as one of its foremost pioneers. At an early stage in his career he showed an originality in thought and practice which brought him international recognition. For a time he practised the orthodox methods of the day, but it was not long before he developed a technique which did much to eliminate the risks of abdominal surgery. The first of his many refinements and innovations was the introduction, in 1901, of the transverse abdominal incision, which he consistently used until his retirement in 1923. Upon the situation of the lesion depend the position and extent of the incision. An incision of adequate length allows of greater precision and of economy in operating-time.

The advances of modern radiology have largely eliminated the exploratory laparotomy, but it still has its place, for the abdomen remains the "temple of surprises." In obscure cases a transverse incision at the umbilical level gives free access and, by adjustments in the position of the patient, renders all regions of the peritoneal cavity operatively accessible.

Stage 1

With the patient in the recumbent position on the table, a transverse incision of the requisite length is made through the skin and subcutaneous tissue. Should it be necessary, there should be no hesitation in dividing the rectus muscle transversely. Haemorrhage is then controlled by passing a ligature on a round needle through the rectus sheath, embracing the muscle and tied upon the anterior wall of the sheath, thereby fixing the muscle at the line of section. In the upper two-thirds of the abdomen the posterior wall of the sheath is incised transversely, but in the lower third the sheath is deficient posteriorly. The peritoneum is incised transversely and the abdominal cavity entered.

Stage 2

The lesion is now located. When it is at the ileo-caecal junction the terminal portion of the ileum may be implanted into the ascending or transverse colon according to circumstance. Should the lesion be in the transverse or descending colon the ileum is anastomosed with the iliac or pelvic colon.

The portion of ileum chosen for anastomosis is stripped and doubly clamped at an appropriate distance from the ileo-caecal junction. The intestine is divided so as to leave 6-8 in. (15-20 cm.) of the ileum free for anastomosis with the colon.

The proximal portion of the divided ileum is closed by a temporary purse-string suture—the ends of which are left long—and the part wrapped in gauze, which is lightly fixed. The distal portion is permanently closed by a Lembert suture, invaginated into the caecum, and the serous coat is overstitched with a fine silk suture for further safety.

The part of the colon chosen for ileal implantation is immobilized by placing two pairs of tenaculum forceps 4 in.

(10 cm.) apart on the taenia coli. Any appendices epiploicae which may be present in this area are removed. The colon is incised in its long axis exactly in the middle line to the extent of 2 in. (5 cm.). At each end of the incision a No. 2 catgut suture is placed (Fig. 1).

The suture temporarily controlling the proximal extremity of the divided ileum is threaded into an intestinal needle, which is introduced into the lumen of the colon and brought out two inches beyond the distal end of the incision in the colon and held by forceps. The free end of the ileum is guided in the colon until about two inches lies free within the lumen (Fig. 2). The ileum is now fixed in position by the sutures which were previously placed at each end of the colonic incision. It is advisable to reinforce this suture at the upper and lower extremities of the wound by a Lembert mattress suture as a further safeguard against possible slipping (Fig. 3).

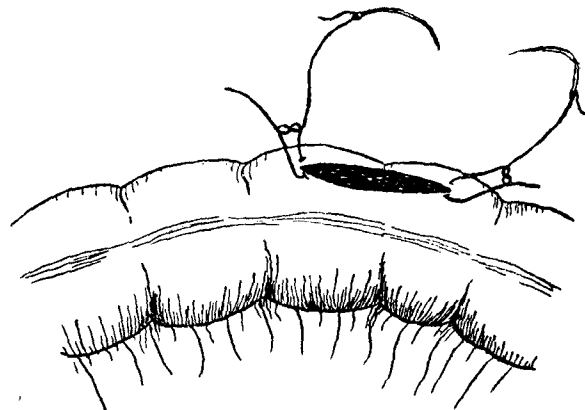


Fig. 1.—Sutures at each end of the longitudinal incision in the colon for the reception of the ileum.

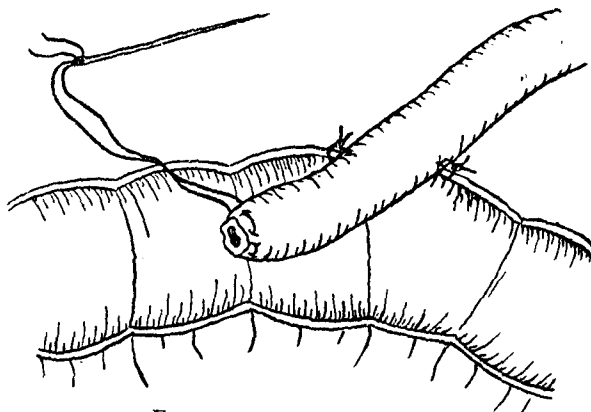


Fig. 2.—The ileum invaginated.

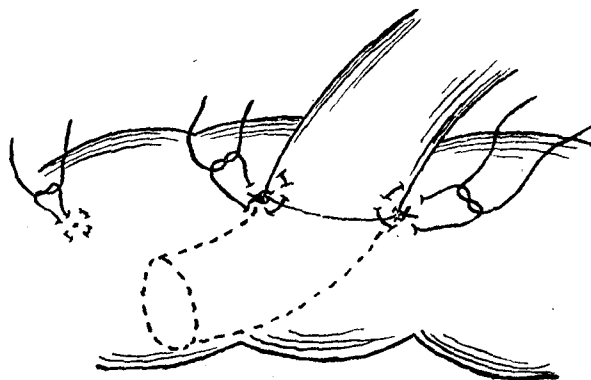


Fig. 3.—Transverse section of the colon, showing the invaginate ileum.

The suture holding the free end of the ileum in the lumen of the colon is now withdrawn and the needle puncture in the anterior wall of the colon closed by a purse-string Lembert suture.

Stage 3

The incision in the abdominal wall is closed in layers by continuous catgut sutures, and the skin by interrupted silkworm-gut sutures or Michell's clips. If the rectus muscle has been divided the posterior and anterior walls of its sheath are closed by continuous catgut sutures: the muscle itself is not stitched and tension sutures are unnecessary.

Comments

The advantages of the transverse abdominal and of the electro-surgical incision have been fully described elsewhere (Moore, 1922; 1940). As only two clamps are used to control the intestinal contents, tissue trauma is largely avoided. The transverse incision affords free and adequate exposure of the peritoneal cavity.

The peristaltic action of the ileum and the colon being similar, the passage of the contents is not adversely affected, and this diminishes the possibility of regurgitation and of the development of ileus.

Leakage does not occur at the anastomotic line, for the greater the pressure of the contents of the ileum the tighter the union. The peristaltic waves travelling in the same direction still further lessen the risk of leakage and regurgitation.

Results have fully justified the operation both in the method of approach and in the reconstruction of the alimentary canal. Most prominent of the beneficial effects observed were the early passage of flatus, the absence of marked abdominal distension, the early return of normal peristalsis, the absence of ileus, the diminution of post-operative sickness and vomiting, and the early restoration of normal appetite.

When the operation was performed in the treatment of faecal fistula, but especially that of the ileo-caecal variety, early and permanent closure of the fistula resulted. In cases of colonic obstruction post-operative comfort was notable. The patient was saved the embarrassing discomfort of colostomy, and a second operation could be performed in a clean field.

Conclusion

Maylard made use of the axiom that "there is nothing new under the sun" when it was mentioned that the transverse abdominal incision had been practised by Paulus Aegineta of Alexandria. It is possible that future research may reveal that this method of anastomosis was practised at an equally early date, but it was undoubtedly originated in this country by Maylard of Glasgow in the early part of the present century.

We were Maylard's assistants. That we assisted him with the operation on many occasions refutes any modern claim to priority. Sonnenburg undoubtedly performed the operation in Berlin some years earlier, as was stated by Professor Macfarlane, whom we also assisted. The credit for this excellent operation must be awarded to Sonnenburg and to Maylard, who, working independently and unknown to each other, devised the method in Germany and in Great Britain respectively. Apart from the substitution of the active electrode for the scalpel there has been no modification of the original technique.

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PENTA-ERYTHRITOL TETRANITRATE IN TREATMENT OF ANGINA

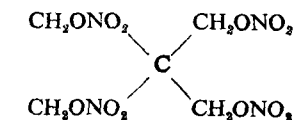
BY

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Penta-erythritol tetranitrate* (P.E.T.N.) is said to be a vasodilator with a prolonged action. It was first used in Sweden during the recent war, when erythritol tetranitrate, which has a similar action, became unobtainable. Subsequently it has been used in France and the United States.

The chemical properties of P.E.T.N. have been described by Van Oettingen *et al.* (1944). At that time this substance, in use as an explosive, was investigated for any harmful effects on its handlers. Its composition is shown by the formula



It is more stable than glyceryl trinitrate and erythritol tetranitrate, and liberates nitrite more slowly than either of these. Absorption from the alimentary tract is slow in animals. In two human volunteers an insignificant rise only was found in blood nitrite up to three hours after the oral administration of 64 mg. No long-term toxicity was noted in animals given P.E.T.N. for one year.

Marche (1950) states that P.E.T.N. acts more strongly on the coronary vessels than on the peripheral circulation; the effect starts 10 minutes after ingestion, and the protective action against angina persists for four to five hours.

Bjerlov (1943) found that the effects of P.E.T.N. in 165 cases were as good as, or better than, those of erythritol tetranitrate. The dose used varied from 45 to 180 mg. daily. Headache appears to have been the most troublesome side-effect. Balatre *et al.* (1949) treated 24 cases, with marked improvement in 12 and moderate improvement in nine. In their series a fall in blood pressure was often seen, and was greater in hypertensive patients. Dailheu-Geoffroy (1950) reported 10 excellent and 69 moderate responses out of 97 cases.

Winsor and Humphreys (1952) gave P.E.T.N. to 125 cases of angina and 125 patients with pain from other causes—arthritis, gall-stones, etc. They found improvement in 78.4% of the anginal patients as compared with 4% of the others. The dose ranged from 10 to 70 mg. daily, averaging 30 mg. (10 mg. thrice daily). Higher doses brought no greater improvement and increased the liability to side-effects (headache, nausea, skin rashes). In three patients with acute coronary insufficiency the resting E.C.G. returned to normal.

Plotz (1952) used 10 mg. three times a day with the occasional addition of 10 mg. at night. He too found that larger doses were not well tolerated. Of 39 cases, 29 were improved (including five in status anginosus), but only four were able completely to discontinue gly-

*The tablets of penta-erythritol tetranitrate used in this investigation were kindly supplied by Bayer Products Ltd., under the name of "mycardol."

ceryl trinitrate. No effect was observed in four patients with cardiac infarction. Talley *et al.* (1952) were not impressed with the effects of P.E.T.N. as compared with a placebo in 14 patients. Perlman (1952) and Samuels and Padernacht (1952) report favourably on the use of P.E.T.N. in peripheral vascular disease.

Materials and Methods

A clinical trial of P.E.T.N. has been carried out on 65 cases with angina pectoris. The series comprised 54 males and 11 females; their ages ranged from 36 to 74, and averaged 56. The diagnosis of angina pectoris was unquestionable in all. In 37 the resting E.C.G. showed evidence of cardiac ischaemia. In three others there was bundle-branch block, and eight patients with normal resting E.C.G.s showed ischaemic changes after exercise. In the remainder the history was classical.

The cases were graded according to their severity as follows:

Grade I: pain only on strenuous effort (2 cases).

Grade II: pain on going uphill, or hurrying, or on walking after a meal or in the cold (27 cases).

Grade III: pain on walking at ordinary pace on the flat (30 cases).

Grade IV: pain on walking at ordinary pace on the flat, in less than 100 yards (6 cases).

Grade V: acute coronary insufficiency—that is, pain at rest and/or on the slightest activity.

Two other grades—0, indicating remission of pain, and VI, denoting fresh cardiac infarction—were also used in the assessment of progress. Only patients whose effort tolerance had remained unaltered for six months or more were included in the trial. Evidence of positive response to the drug was provided by an increase in effort tolerance, so that the case moved into a better grade, or by a decrease in the pain brought on by the same amount of effort.

Tablets containing 30 mg. of P.E.T.N. were used, dummies identical in appearance and taste with these being also supplied for control purposes. Each patient was instructed to swallow two tablets three times daily, at regular intervals. In some cases this dose was later increased. Thirty-four patients were given P.E.T.N. and 31 had dummy tablets. Approximately 50% of the patients in each effort grade were put into each group. After two to three months 15 patients whose condition remained unaltered while taking dummy tablets had P.E.T.N. substituted without their knowledge. Another group of 15 patients, who were apparently improved while taking P.E.T.N. were switched to dummy tablets or had their P.E.T.N. tablets discontinued. In most cases the results were assessed after a period of not less than three months; in nine cases treatment with P.E.T.N. was maintained for longer periods in order to determine the development of any tolerance or of long-term

TABLE I.—Results

	Cases Treated Primarily with P.E.T.N.	Cases Treated with P.E.T.N. after Serving as Controls without Change	Total Results in All Treated Cases	Control Group
Effort grading improved	8 (24%)	1 (7%)	9 (18%)	3 (10%)
Pain less severe and or less glyceryl trinitrate needed	6 (17%)	2 (14%)	8 (17%)	3 (10%)
No change	11 (33%)	11 (73%)	22 (44%)	23 (74%)
Pain more severe, or less effort possible, or further ischaemic E.C.G. changes	6* (17%)	1 (7%)	7* (15%)	2 (6%)
Treatment discontinued because of side-effects	3 (9%)	0	3 (6%)	0
Total	34	15	49	31

* One of these patients died of fresh occlusion, but this did not occur until two months after discontinuing treatment.

toxic manifestations. All patients had glyceryl trinitrate if an attack of pain occurred. The results are shown in Table I.

In addition, two in-patients with acute coronary insufficiency were given P.E.T.N. for short periods without any apparent effect on their progress. In a third case in this group P.E.T.N. was shown to influence effort changes in the E.C.G. (See Fig.).

Dosage.—The dose was 60 mg. thrice daily in most cases, but in 9 patients who failed to show improvement it was increased to 60 mg. four times a day. This resulted in some relief in two cases. A further increase to a daily total of 300 mg. proved intolerable, because of side-effects, in all but one case. This patient has been able to tolerate 360 mg. daily for over six months, with definite improvement in effort tolerance.

Side-effects.—Undesirable side-effects were experienced by eight patients. They comprised lethargy (often with a sense of depression) in five, digestive upset in three, headache in two, and visual disturbance in one. In three of the cases these side-effects resulted from the routine daily dose of 180 mg. and were troublesome enough to necessitate withholding the drug. In one of these patients toxic symptoms reappeared when treatment was recommenced with only 90 mg. daily. In the remainder side-effects were seen only with higher doses. No long-term toxic effects have been observed in 10 patients who have taken the drug for periods of six months up to one year, and no diminution of effectiveness has been seen in these cases.

P.E.T.N. and the Electrocardiogram

The effect of P.E.T.N. on the electrocardiogram was studied in six cases. In three of these the ST segment depression induced by effort was abolished by oral ingestion of 120 mg. of P.E.T.N. The illustration shows how this effect is present 15 minutes after taking the drug. It is seen to persist for four hours but not for five.

There was a definite relationship between E.C.G. patterns and response to P.E.T.N. in the 46 cases in which treatment was maintained (Table II). Thus of 30 cases with

TABLE II

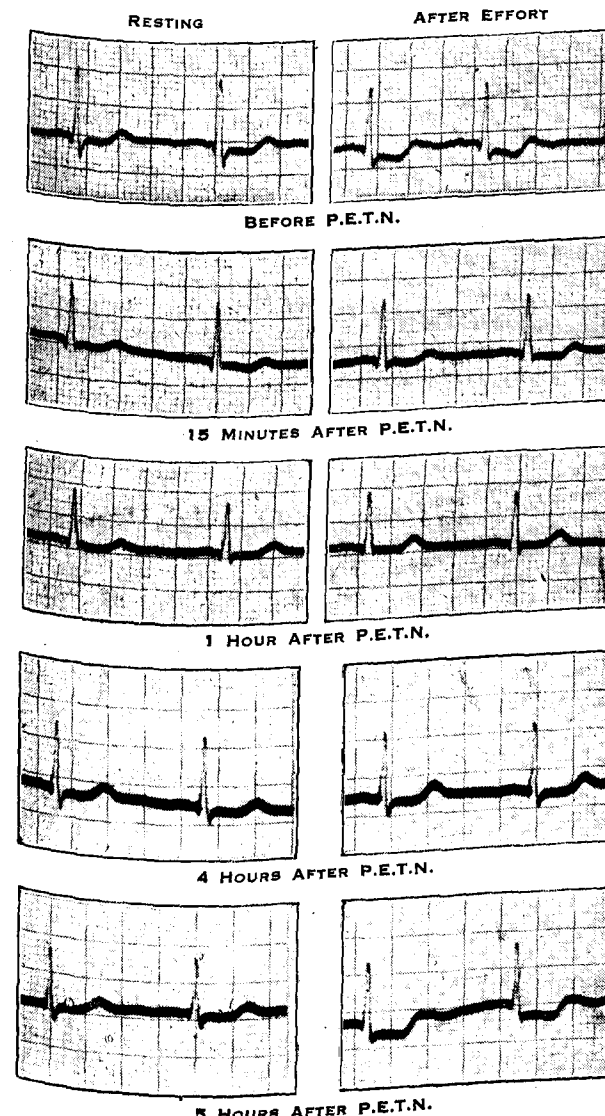
E.C.G.	No. of Patients	No. Improved (Effort More or Pain Less)
Normal	11	3
Normal at rest, effort test positive	3	1
Ischaemic	11	6
Infarction	16	7
Others (3 bundle-branch block, 2 auricular fibrillation)	5	0

electrocardiographic proof of coronary disease, 14 (48%) responded to P.E.T.N. as compared with 3 out of 16 (19%) without such proof. It therefore seems that the more severe the ischaemia the more likely is the case to benefit from P.E.T.N. Winsor and Humphreys (1952) state that the worst cases show the greatest improvement. However, in the present series there was no correlation between severity of symptoms and response to the drug.

The E.C.G. was repeated in 12 patients under treatment with P.E.T.N. In one it was found to have reverted to normal; in two others the ST depression after exercise was abolished or lessened; in five there was no change; and in four the E.C.G. showed deterioration.

Effect on Blood Pressure

Casual readings were made in the out-patient department two to four hours after the last dose. In no case was there any significant fall in pressure. Other authors have described definite hypotensive effects from P.E.T.N. Thus Bjerlov (1942), after 30 mg., found a fall of from 10 to 45 mm., lasting two to five hours in 10 patients; Balatze



Electrocardiographic record (Lead V5) before and after taking P.E.T.N.

et al. (1949) state that 20 mg. can provoke a fall of 30–35 mm. in the systolic and 15–20 mm. in the diastolic pressure in man. This was not confirmed in the present series, nor was there any significant fall in basal pressures measured over three hours in two normal subjects after taking 60 mg. These findings are in agreement with those of Plotz (1952), who found no notable fall in 35 cases.

Other Conditions.—The series included two cases with syphilitic aortic incompetence and one with rheumatic valvular disease. In these, P.E.T.N. had no effect on effort pain.

Discussion

One may regard the improvement that occurred on dummy tablets as indicating the extent to which natural amelioration and psychological factors affect results. Taking this into consideration, the improvement rate is significantly greater in the treated group. Furthermore, it was shown that P.E.T.N. could abolish electrocardiographic changes due to effort, and that this effect could persist for four hours. Winsor and Humphreys (1952) have demonstrated the same phenomenon.

It was therefore rather surprising that the response was so poor in the 15 patients who were given P.E.T.N. after a period on dummy tablets, as compared with the group primarily treated with P.E.T.N. Since this finding cast doubt

on the validity of the results, a further check was made in another 15 patients who had improved with P.E.T.N. In seven all tablets were stopped, and in five of these the symptoms returned to their previous severity; but no deterioration was noted in five out of eight cases in which dummy tablets were substituted for P.E.T.N.

This finding detracts still more from the significance of the results. However, another explanation is worth considering. It is possible that the maintenance of improvement in the treated patients subsequently given dummy tablets was the result of an increase in collateral circulation induced by P.E.T.N. Zoll and Norman (1952) have shown that sodium nitrite stimulates the development of anastomotic vessels in the pig's heart after experimental coronary occlusion: a significant increase in collaterals is seen after as little as two days' treatment. There is, however, no direct proof that P.E.T.N. does cause any increase in the number of coronary anastomoses in man; and the finding, already stated, of progressive ischaemic change in the E.C.G.s of four cases under treatment shows that any such effect is not invariable.

The evidence is thus seen to be inconclusive, and further study would appear to be indicated. The results obtained by direct comparison of the two primary groups in the trial show a significantly greater improvement rate in the treated cases. The subsidiary studies throw doubt on this finding. Nevertheless, unquestionable and sustained improvement in effort tolerance was observed in about one-fifth of the treated cases, and some symptomatic relief in a like number. Objective evidence of improvement in coronary blood flow has also been furnished by effort tests.

Conclusions

P.E.T.N. would appear to have a place in the treatment of cardiac pain. In a small number of cases its routine prophylactic administration may replace the necessity for glyceryl trinitrate. Patients whose sleep is disturbed by nocturnal angina may benefit from a dose of P.E.T.N. taken before retiring. If patients find that routine P.E.T.N. diminishes but does not obviate the need to take glyceryl trinitrate for anginal attacks, there is probably little purpose in their taking two drugs rather than one. An exception to this is the case in which angina is most troublesome on first rising. Such patients often find that a tablet of glyceryl trinitrate chewed first thing may enable them to dress and get to work without pain. In such cases the combination of early morning glyceryl trinitrate with routinely spaced doses of P.E.T.N. may result in almost complete freedom from anginal attacks. P.E.T.N. seems to have little or no influence on acute episodes of increasing ischaemia.

Summary

Penta-erythritol tetranitrate (P.E.T.N.) is an anti-anginal drug with a prolonged action, lasting up to four hours after administration. This effect has been confirmed by electrocardiographic studies.

Forty-nine patients have been treated with this substance for several months. The usual dose employed was 60 mg. thrice daily. In nine patients effort tolerance was improved, and a further eight patients noticed diminution in the number and severity of anginal attacks.

This response was significantly greater than that of a control group taking dummy tablets; but the results after substituting drug for dummy, and vice versa, were not entirely in keeping with the original findings.

The use of P.E.T.N. for preventing angina is of value in some patients, but seldom replaces the need for glyceryl trinitrate.

This investigation was undertaken at the instigation of Dr. Paul Wood, Director of the Institute of Cardiology, and the majority

of the patients were under his care. I would like to express my gratitude for his advice and encouragement. My thanks are due also to other members of the staff of the National Heart Hospital for their assistance in the selection and observation of cases.

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APPENDICITIS IN THE COURSE OF
MEASLES

BY

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Having personally seen seven cases of appendicitis occurring during the course of measles in the space of 18 months, I searched for any report on this matter in a British journal. No such report was found, except for a most interesting letter from Dr. Leak (1935). Several papers on this subject have been published in the German and American literature. In several standard works, gastro-intestinal lesions are described. Nothnagel (1902) discusses the pathology of individual organs as affected in measles as follows. "Although no anatomic changes are demonstrable in the intestines, the occurrence of frequent evacuations during an attack of measles bears a close relation to the underlying infectious process. Diarrhoea may appear as an early symptom, ushering in the enanthemic stage or even preceding it, but may also persist until after the conclusion of the eruptive stage. . . . The diarrhoea is ascribed to the specific inflammation of the intestinal mucous membrane, to the eruptive process by which it is affected."

In *Modern Practice in Infectious Fevers* (1951) lesions of the gastro-intestinal tract are described thus: "Inflammatory catarrh with desquamative changes extends the whole length of the digestive tract. Koplik spots may appear anywhere, including the vermiform appendix, which is often swollen and congested and may undergo suppurative or necrotic changes. Multinucleated giant cells may be found similar to those in the spleen, tonsils, and lymph glands."

Harries and Mitman (1951) also make reference: "Some observers have claimed that tenderness over the appendix region or a definite attack of appendicular colic is not infrequent during the prodromal stage of measles, and would correlate this occurrence with the demonstration of giant cells in the mucosa of the appendix. Laparotomy in such cases has revealed an appendix normal to the naked eye or showing catarrhal

changes only. On the other hand, acute perforative appendicitis has occurred, probably as a fortuitous complication."

A brief description of seven cases is given below.

Case Reports

Case 1.—Male aged 4 years. *History*:—Two days before admission the child developed severe right-sided abdominal pain of colicky nature. He did not eat his evening meal. The attacks were spasmodic. He still had pain the next day. On the day of admission he awoke screaming with right-sided pain, and occasionally drew up his legs. A loose stool was passed. There were no urinary symptoms. *Examination*:—Tenderness in right iliac fossa. P.R., marked tenderness on right side; T. 99.2 (37.3° C.), P. 120, R. 24. *Operation*:—Gridiron incision. Peritoneum healthy. Acutely inflamed pelvic appendix found and removed. Rash appeared four days after operation.

Case 2.—Male aged 11 years. *History*:—Four days before admission, developed cough and sore throat. Twenty-four hours before admission, measles rash appeared. Eight hours before admission, he awakened with colicky pain localized to the right iliac fossa; vomited once and passed a stool. Further pain two hours later. *Examination*:—Definite tenderness in right iliac fossa—localized. P.R. tender on the right; T. 98.6 (37° C.), P. 80, R. 22. *Operation*:—Gridiron incision; appendix showed slight redness. Rash appeared one day before admission.

Case 3.—Male aged 5 years. *History*:—Twelve hours before admission, while at school, he developed right-sided abdominal pain, not severe enough to make him leave. Pain became worse on way home and he vomited. *Examination*:—Tender in both iliac fossae. P.R., tender on both sides; T. 98 (36.7° C.), P. 112, R. 26. *Operation*:—Gridiron incision. Apparently healthy appendix—no fluid. One small gland felt. Appendix removed. Rash appeared four days after operation.

Case 4.—Male aged 5 years. *History*:—Forty-eight hours before admission, developed pain in right side and across lower abdomen; colicky. Vomited twice. *Examination*:—Tender in right iliac fossa with muscle-guarding. P.R., tender. *Operation*:—Gridiron incision. Slightly inflamed appendix removed. T. 99.4 (37.4° C.), P. 96, R. 20. Rash appeared four days later.

Case 5.—Male aged 4 years. *History*:—Four days before admission, developed measles. Twelve hours before admission, onset of acute abdominal pain. Pain recurred eight hours later and he had a third spasm just before admission. *Examination*:—Well-marked measles rash. Abdomen held rigid. Definite tenderness in right iliac fossa. *Operation*:—Gridiron incision. Perforated appendix with small quantity of purulent fluid in peritoneal cavity. Appendix removed. Rash appeared four days before admission.

Case 6.—Male aged 2½ years. *History*:—Three days before admission, complained of abdominal pain and vomited. Vaguely "out of sorts" for a day or two before this. Next day pain localized to right iliac fossa. Vomited three times. Fevered. Passed one loose stool. Observed overnight at Children's Hospital. Measles rash next morning. Transferred to City Hospital. Abdominal symptoms attributed to measles. Very definite signs of acute appendicitis, but operation postponed again because of the measles. T. 102.6 (39.2° C.), P. 160, R. 30. By the next day the child had obvious peritonitis and a mass could be felt high in the right iliac fossa. *Operation*:—Gridiron incision. Purulent fluid in peritoneal cavity. Retrocaecal appendix with early abscess formation. Appendix removed and peritoneum drained. Rash in this case appeared two days before operation. The child developed pneumonia and died six days after operation.

Case 7.—Female aged 5 years 11 months. *History*:—Abdominal pain four days before admission. Slight pain present next day, when child vomited on three occasions.

Two days before admission, pain disappeared, but recurred on the day she came into hospital. Mainly para-umbilical. *Examination*:—Tender on deep palpation in the right iliac fossa. P.R., very tender. *Operation*:—Right paramedian incision. Apparently normal appendix found and removed. Ileocaecal mesenteric adenitis present. Rash appeared two days after operation.

Pathology

Davidsohn and Mora (1932) drew attention to a type of giant multinucleated cell found in appendices removed during the prodromal stage of measles. This type of cell had been previously reported by Warthin (1931) in tonsils removed at the same stage of the disease. Hudson and Krakower (1936) quote Finkeldey (1931) as describing them originally. Others who found them in the appendix include Hathaway (1935) and Avancini (1948).

It was thought by Davidsohn and Mora (1932) that the abdominal pain was due to changes in the lymphoid tissues in the gastro-intestinal tract. This reaction was thought to be directly attributable to measles. In some appendices many of these multinucleated cells were found, especially in those not showing much naked-eye evidence of inflammatory change. In others showing obvious inflammatory change very few of these cells were found, although they were present in regional lymph nodes. One theory to account for this, put forward by Davidsohn and Mora, was that the swelling of the mucosa of the appendix prepared the way for secondary invaders. By the time these true inflammatory changes had occurred the giant multinucleated-cell reaction had passed. A parallel can be found in tonsils removed during the prodromal stage of measles.

In the present series only one appendix (Case 4) was sectioned. At operation the appendix was thought to be slightly inflamed. The histological report, by Professor Young, was:

"The appendix had been opened from base to tip by the surgeon before fixation, and it was bisected longitudinally for microscopical examination. No notable abnormality was visible to the naked eye."

"Microscopically, the mucosal lymph follicles showed a peculiar hyperplasia of their reticulum cells, culminating in the formation of numerous giant cells, the largest of which were crammed with 100 or more small vesicular nuclei, while smaller forms contained as few as two or three relatively large nuclei with prominent nucleoli; in all cases, the cytoplasm was extremely scanty. Chromatin fragments resulting from karyorrhexis were often observed in the germinal centres, but there was no focal necrosis, and the general architecture of the lymphoid tissue was remarkably well preserved. No inclusion bodies were identifiable. The muscularis was normal in appearance apart from the presence of a very few perivascular round cells, but the serous coat showed a minor degree of fibrous thickening, with increased vascularity. There was no evidence of pyogenic inflammation."

"Comment: The changes in the lymphoid tissue of the appendix conform in every essential respect to those described by Warthin (1931) in the tonsil in the prodromal stage of measles."

The findings at operation in the seven cases reported were that two appendices were normal, three were acutely inflamed, and two were perforated.

Koch (1937) described two cases, in both of which the appendices were acutely inflamed. Angel and Kizinski (1938) described three cases and reviewed the literature. Their three cases all showed acute inflammation at operation. With the seven cases here reported, I have found 49 described in the literature, mostly in the United States of America, with a few contributed from Germany. Of these, 26 showed subacute or acute inflammatory changes, 12 showed abscess formation, 4 were gangrenous, 5 were perforated with pus in the peritoneal cavity, and 2 showed no naked-eye inflammation. The histology of one of these is described above.

Onset with Relation to the Rash

Hudson and Krakower, reviewing the literature, found 40 cases. Of these, 15 developed the symptoms during the pro-

dromal stage, 12 during the period of eruption, and 13 in the immediate convalescent stage. Koch's two cases occurred during the eruptive period. In the present series, four occurred during the prodromal stage and three during the eruptive period. Thus, of 49 cases, 19 developed the symptoms during the prodromal stage, 17 during the eruptive period, and 13 in the immediate convalescent period.

Discussion

While it is admitted that appendicitis and measles are both very common diseases in childhood, it is felt that the occurrence of the two together is not fortuitous. For many years appendicular colic has been a known concomitant of measles. Several workers have shown that it is dangerous to assume that the abdominal pain is part and parcel of measles. Most of the appendices removed showed acute inflammatory processes, and of the 49 reported 26 showed acute inflammatory change and 21 had gone on to the gangrenous stage and had ruptured, causing peritonitis or local abscess formation.

The case histories here reported show that abdominal symptoms had been present from 12 to 72 hours before the rash became obvious. All of them were most suggestive of acute appendicitis, and on clinical examination the findings were also in favour of this condition.

The pathology has been briefly outlined, and also the relationship of the abdominal condition to the stage of measles. In view of the acute nature of the appendicitis in this condition, and the speed with which abscess and/or perforation can occur, any sign or symptom of appendicitis in the course of measles should not be lightly dismissed. On the contrary, if, during the course of measles, abdominal symptoms should be equivocal, repeated examinations should be carried out. Angel and Kizinski (1938) advocate this, and Davidsohn and Mora (1932) are of the same opinion. The latter also quote Trepel as emphasizing that appendicitis occurring during the prodromal stage is a more acute and fulminating process. Case 6 had operation postponed as measles developed. When this case was discussed with surgical colleagues, in retrospect, their feeling was that, had measles not developed the day after admission, operation would have been carried out then. If operation had been carried out shortly after admission instead of 72 hours later, perhaps the inflammatory process would not have advanced to local abscess formation with peritonitis.

It is felt that measles probably initiates subsequent infection of the appendix. Thenebe *et al.* (1933) suggest that there may be ischaemia of the appendix, due to pressure of the enlarged lymphoid tissue in the submucosa and, for the same reason, interference with the flow of lymph. This leads to a local or a more extensive area of necrosis. This in turn is followed by bacterial invasion, probably from the ever-present intestinal flora.

From the above discussion and for the reasons given, it is strongly recommended that any child with measles in whom a diagnosis of acute appendicitis is made should be operated upon forthwith. Where the signs are less definite repeated examination at short intervals should be carried out.

Summary

Seven cases of appendicitis occurring in the course of measles are described, with one death.

A brief review of the literature is given.

The pathology of one case is given in detail, showing the typical findings during the prodromal stage of measles. This consists in an intense lymphoid reaction and the presence of multinucleated cells and a type of giant cell. It is confirmed that the presence of these cells is pathognomonic of measles in the prodromal stage.

During the course of measles, symptoms of acute appendicitis warrant immediate operation.

I would like to express my thanks to Professor John Craig for his help and advice and to Professor Young for the histological report.

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THE LARYNGEAL MICROPHONE AS AN AID TO TREATMENT OF BULBAR POLIOMYELITIS

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In the treatment of bulbar poliomyelitis the prime requirement is the maintenance of a clear airway. Failure to keep the airway free from obstruction results in anoxia and hypercapnia. McDowell and Wolff (1953) have advocated early tracheotomy as a prophylactic measure in bulbo-spinal cases. Galloway (1947) recommends tracheotomy in bulbo-spinal cases, and also in other types of the disease whenever there is difficulty in maintaining a clear airway. The frequency with which tracheotomy may be needed should be much reduced if the technique of detecting and removing obstruction is improved. Ritchie Russell (1952) has stressed the need for a continuous watch over the patient to detect obstruction at the earliest possible moment. If this can be done, and adequate postural drainage in the prone position is used, most cases of bulbar poliomyelitis uncomplicated by failure of respiratory muscles can be kept fully ventilated without tracheotomy.

The first indications of obstruction are not, however, easily detected even by experienced nurses, especially if there is much other noise in the ward. In order to eliminate this source of danger, an instrument has been developed to amplify respiratory sounds so that the slightest obstruction is immediately apparent. It has been tried out in two epidemics and has proved to be of the greatest value.

The instrument, as constructed here, consists of a standard pattern of U.S. Air Force laryngeal microphone;* together with an amplifier and loudspeaker. Details of the construction of two models, one mains-operated and the other battery-operated, are given below.

The method of using both instruments is the same. The microphone is placed over the patient's larynx and held in place by an elastic band. If the laryngeal position is inaccessible, as may be the case when the patient is prone, the microphone may be placed on the back of the neck, over the temple, or even on the occiput, when the sounds will be picked up by bone conduction.

*Type ZA.19734, readily obtainable from many shops dealing in radio equipment, and advertised in *Wireless World*.

Light pressure only is required, just enough to prevent displacement by the patient's movements. The volume is then adjusted until the intermittent rushing sound produced by normal unobstructed respiration is just audible without being obtrusive. Under these conditions the sound caused by obstruction of the airway is loud enough to draw attention from the far end of the ward. The bubbling sound, accompanied by loud rhonchi so produced, is quite unmistakable, and quite distinct from the more clattering or clicking noise produced by swallowing.

Construction of the Instruments

The circuit diagram of the mains-operated instrument is given in Fig. 1, and of the battery model in Fig. 2.

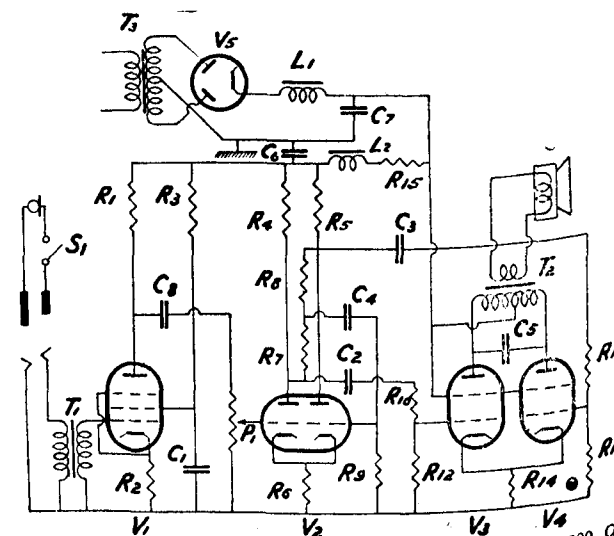


FIG. 1.—Circuit of mains-operated unit. R_1 , 100 K Ω . R_2 , 1,500 Ω . R_3 , 250 K Ω . R_4 , 100 K Ω . R_5 , 100 K Ω . R_6 , 1,500 Ω . R_7 , 1 M Ω . R_8 , 500 K Ω . R_9 , 100 K Ω . R_{10} , 100 K Ω . R_{11} , 500 K Ω . R_{12} , 500 K Ω . R_{13} , 50 K Ω . R_{14} , 50 K Ω . R_{15} , 50 K Ω . T_1 , Microphone input transformer, 100:1. T_2 , Speaker output transformer, 300-0-300 V, 5 V. C_1 , 0.1 μ F. C_2 , 0.1 μ F. C_3 , 0.1 μ F. C_4 , 0.001 μ F. C_5 , 8 μ F. C_6 , 8 μ F. C_7 , 0.01 μ F. C_8 , 0.01 μ F. C_9 , 0.01 μ F. C_{10} , 0.001 μ F. C_{11} , 0.001 μ F. C_{12} , 0.001 μ F. C_{13} , 0.001 μ F. C_{14} , 0.001 μ F. C_{15} , 0.001 μ F. V_1 , 524. P_1 , 500 K Ω . L_1 , 5H, 100 mA. L_2 , 100H, 5 mA.

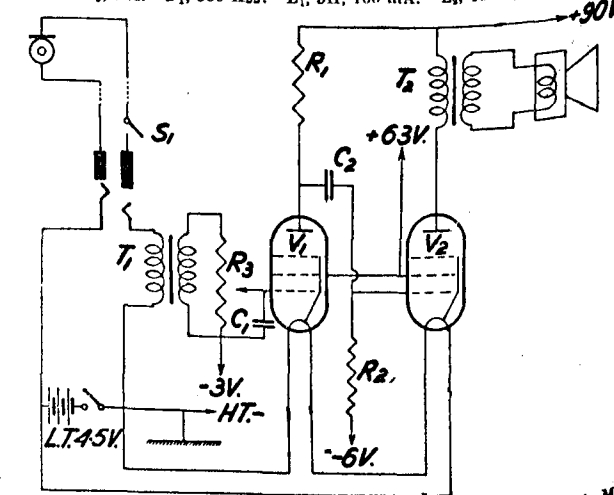


FIG. 2.—Circuit of battery-operated unit. R_1 , 30 K Ω . R_2 , 1 M Ω . R_3 , 500 K Ω . R_4 , 100 K Ω . R_5 , 100 K Ω . R_6 , 1,500 Ω . R_7 , 1 M Ω . R_8 , 500 K Ω . R_9 , 100 K Ω . R_{10} , 100 K Ω . R_{11} , 500 K Ω . R_{12} , 500 K Ω . R_{13} , 50 K Ω . R_{14} , 50 K Ω . R_{15} , 50 K Ω . T_1 , Microphone input transformer, 100:1. T_2 , Speaker output transformer, 300-0-300 V, 5 V. C_1 , 0.1 μ F. C_2 , 0.1 μ F. C_3 , 0.1 μ F. C_4 , 0.001 μ F. C_5 , 8 μ F. C_6 , 8 μ F. C_7 , 0.01 μ F. C_8 , 0.01 μ F. C_9 , 0.01 μ F. C_{10} , 0.001 μ F. C_{11} , 0.001 μ F. C_{12} , 0.001 μ F. C_{13} , 0.001 μ F. C_{14} , 0.001 μ F. C_{15} , 0.001 μ F. V_1 , 524. P_1 , 500 K Ω . L_1 , 5H, 100 mA. L_2 , 100H, 5 mA.

As will be seen, the mains amplifier is a three-stage type, with push-pull output to an 8-in. (20 cm.) loudspeaker. This provides a maximum output volume much greater than is normally needed. The highest and lowest notes are attenuated, as the required diagnostic sounds are mainly in the middle frequency range, from 100 to 2,000 cycles approxi-

Leucocyte Counts

	Hb %	W.B.C. per c.mm.	Neutros. %	Eosins. %	Lymphs. %	Platelets per c.mm.
6/11/50	76	1,700	33	4	61	
15/11/50*	72	1,800	79	2	17	
18/11/50*	70	5,500	82	2	13	130,000
28/11/50*	67	2,650	62	—	30	
18/12/50	68	2,000	44	5	44	
30/3/51	70	1,500	15	7	74	175,000
2/4/51	75	1,450	9	4	85	144,000
3/4/51	90	13,000	88	—	9	
4/4/51	95	7,200	54	1	44	465,000
22/5/51	95	6,400	41	8	44	
24/7/51	87	9,900	52	3	42	380,000
25/9/51	97	11,900	64	1	34	280,000
1/12/52	91					

* Counts taken during course of pyogenic pneumonia.

leucocyte count of 5,500 was recorded on one occasion, coinciding with some clinical improvement, but consolidation appeared in the left lower lobe soon after. Folic acid did not affect his condition. Three weeks after admission his temperature had settled and he was much better, but there were still signs of consolidation, and radiologically there was cavitation. The only organisms isolated from his sputum were *Proteus vulgaris* and *Bact. coli*. The signs gradually cleared over the following month, but some residual fibrosis remained. During convalescence transfusion of 1 pint (570 ml.) of fresh blood did not affect his white-cell count.

He was discharged in January, 1951, and readmitted two months later for splenectomy, with a view to correcting his neutropenia, to which the severity of his pneumonia was attributed. He was then a rather pale man with rheumatoid changes of moderate degree in his joints, ulnar deviation of his fingers, and a spleen which extended below his umbilicus. There was no lymph-node enlargement, his liver was not palpable, he was not pigmented, and there was no ulceration of skin or mucous membranes. Red-cell fragility was normal, reticulocytes 2%, and liver function showed abnormal flocculation reactions, while his serum albumin was 3.6 g. and globulin 3.7 g. per 100 ml. Splenectomy was performed by Mr. J. R. M. Whigham. The spleen, which measured 29 by 12 by 9 cm., was removed fairly easily, there being only a few adhesions. Sections showed congested sinusoids, increase of reticular tissue, and heavy plasma-cell infiltration. Biopsy of liver showed no significant histological abnormality. Bone-marrow biopsy at operation showed slight increase of erythropoiesis over leucogenesis and evidence of delay in polymorph maturation. Recovery from operation was uncomplicated. Since operation his joints have shown little or no improvement, his E.S.R. has remained high, and the abnormal liver function is unchanged. However, the leucocyte count is at normal levels, his haemoglobin is significantly improved, and he looks and feels much better.

COMMENT

Hutt and his colleagues noted an improvement in the general well-being of their patients. One was described after operation as "full of pep and working better than for years." A very noticeable feature of the present case was a change of disposition. Before operation he was a morose and taciturn man who appeared to care little whether he improved or not. He seems to have acquired a new zest for living, and for the first time shows interest in his future progress and in finding a job.

I am greatly indebted to Mr. J. R. M. Whigham and Dr. D. W. G. Smith for permission to publish this account and to Dr. Louis Steingold for the pathological reports.

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- Hutt, M. S. R., Richardson, J. S., and Staffurth, J. S. (1951). *Quart. J. Med.*, 20, 57.

mately. Amplification over this range, which is roughly the minimum required for comprehensible speech, is adequate. As the loudspeaker and microphone are usually fairly close together, amplification of higher frequencies is very apt to cause oscillation from acoustic feedback; this will, in any case, happen when the microphone is removed from the patient, and it should always be switched off by the switch, S_1 , when not in place on the patient.

The microphone used with this instrument is an electromagnetic type which is particularly robust and reliable, and gives excellent results. The battery model uses a carbon microphone; although this does not give quite the same frequency response, and has a rather higher noise level, it was chosen for this purpose because it gives a much larger output, so that a simpler amplifier, with correspondingly reduced drain on the batteries, could be used. A simple two-valve amplifier, using a DF92 voltage amplifier and a DL92 output valve, is all that is needed.

The same precautions with regard to acoustic feedback are desirable, though the oscillation is not so offensive in the battery model as in the mains one, because the maximum output power is so much less.

An instrument of similar performance and specification to the mains-operated model, but lighter and more compact, is now available from Isis Equipments, Broad Street, Oxford.

Acknowledgment is made to Dr. W. H. Kelleher for his assistance in testing this instrument in clinical use at the Western Hospital, Fulham, and to Dr. W. Ritchie Russell and the staff of the poliomyelitis unit, Stoke Mandeville Hospital, for carrying out extensive trials during the 1952 epidemic.

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Medical Memorandum

Felty's Syndrome Treated by Splenectomy

Felty's syndrome is the name given to a rare but characteristic triad of arthritis of rheumatoid type, splenomegaly, and leucopenia, with which generalized lymph-node enlargement and hepatomegaly may be associated. The leucopenia has been regarded as a hypersplenic manifestation, and since it may give rise to disabling symptoms a number of patients have been treated by splenectomy. Hutt, Richardson, and Staffurth (1951) report four cases, two of which had corneal ulceration, and a third chronic leg ulcers. After splenectomy there was a continued improvement in the neutrophil count in all and a significant increase in the haemoglobin percentage in three. The ulcers healed, and one patient had lasting improvement in his arthritis.

CASE REPORT

A male radiographer now aged 35 first noticed joint pain in 1937. In 1940 he joined the R.A.M.C. and remained in the regular Army until he was invalided out with a diagnosis of Felty's syndrome in June, 1950. He had first come under medical supervision in 1943 when a diagnosis of rheumatoid arthritis with leucopenia was made. In 1950 his joints became worse and the investigations which led to his discharge revealed, in addition to the leucopenia, a spleen enlarged to 6 in. (15 cm.) below the costal margin.

He first attended hospital on November 6, 1950, for a blood count. He became unwell a few days later, and was admitted to hospital critically ill with a right upper lobe pneumonia. He was treated with large amounts of penicillin, but response was very poor. On the third day in hospital his temperature was still very high and there were signs of massive consolidation, but his leucocyte count was only 1,800 per c.mm., with 79% neutrophils (see Table). Streptomycin and aureomycin were given in full doses, and his temperature and clinical condition slowly improved. A

Reviews

PARIETAL LOBES

The Parietal Lobes. By Macdonald Critchley, M.D., F.R.C.P. (Pp. 480; illustrated. 70s.) London: Edward Arnold and Co. 1953.

The functions of the parietal lobes have been the subject of much interest and even more speculation, but this book is one of the first to be devoted wholly to the subject. The opening chapter on anatomical considerations is excellent, and, as Critchley emphasizes, the parietal lobes are really "empirical conceptions rather than autonomous entities in the anatomical or physiological sense," for they are merely those parts of the cerebral hemispheres which happen to be covered by the parietal bones. He traces the comparative anatomy, and includes surmises on the probable parietal configuration of *Pithecanthropus erectus* and Neanderthal man as judged by the markings on fossil cranial bones. The sensory defects found with parietal lesions are discussed in detail, and there is an interesting section on the controversial subject of localized muscle wasting, a physical sign which, although it was first described in England, has attracted little attention since then in this country.

The greatest value of the book is the exhaustive account of the more subtle disturbances which may occur with parietal lobe lesions and of the special techniques which may be necessary to demonstrate and evaluate them. They include constructional apraxia, visual disorientation, tactile inattention, the Gerstmann syndrome, and disorders of the body image and of symbolic thought. A study of these chapters reveals the rich diversity of parietal symptomatology and makes clear what is meant by some of the inelegant words which are at times used to denote these symptoms.

This monograph is a most important contribution to neurology. Critchley has collected a vast amount of information on the parietal lobes, much of it published in French and German journals, and has brought a good deal of order out of a chaos of observations by the application of his highly critical and, as the last chapter especially shows, constructive mind. The book is most interestingly written, is illustrated by numerous diagrams and by photographs of men who have made major contributions to the subject, and contains nearly 1,100 references, the title of each being given in full. It is essential to the neurologist, and should prove of the greatest value to everyone interested in psychology and psychiatry.

J. W. ALDREN TURNER.

CARBOHYDRATE METABOLISM

Ciba Foundation Colloquia on Endocrinology. Volume VI: Hormonal Factors in Carbohydrate Metabolism. General Editor, G. E. W. Wolstenholme, O.B.E., M.A., M.B., Ch.B., assisted by Jessie S. Freeman, M.B., B.S., D.P.H. (Pp. 350; 94 illustrations. £1 15s.) London: J. and A. Churchill. 1953.

The sixth volume in the series of the Ciba Foundation follows the same general plan as its predecessors. Internationally famous experts are gathered together, they present their formal papers, and then the ensuing informal discussion is recorded in full. The result is a revealing indication of the present state of informed opinion on the subjects under discussion. At the present Conference nine nations are represented, with five visitors from Switzerland, twelve from the United States, and eighteen from Britain. Although many of the papers are reports of rather specialized research work, yet there are many more general reviews which should prove of great value to all clinicians who have an interest in carbohydrate metabolism.

The volume starts with a series of three papers on enzyme systems in intermediate carbohydrate metabolism, and in glycogen synthesis. These are by well-known authorities, including C. F. Cori, and are for those with a

specialized knowledge of intermediate carbohydrate metabolism. There follows a series of papers on the conversion of carbohydrate to fat. Modern studies by means of radioisotopes show clearly that insulin has a major role in the conversion of carbohydrate to fat in animals. This work is well reviewed, as also is that showing how A.C.T.H. and growth hormone impede this conversion.

There is plenty here of clinical interest. The role of insulin is discussed in many papers, which give an account of the evidence for two types of human diabetes, the response of the human liver, normal and diabetic, to insulin, the mechanisms of obesity, and the effects of adrenal steroids on carbohydrate metabolism in man. There is an excellent review of the effects of insulin, growth hormone, and A.C.T.H. on the rate and manner of glycogen deposition in muscle of different types. It is clear that the action of insulin is far more complex than was at first thought. Finally several papers discuss the influence of sex hormones and of pregnancy on carbohydrate metabolism, and two the significance of fructose in semen.

As is inevitable in such a compilation, the papers vary considerably in their appeal, but this volume contains a high proportion of first-rate quality and of wide clinical interest. The volume sustains well the high standard of the whole series.

C. L. COPE.

SPORT MEDICINE

Sport Medicine: Proceedings of the International Symposium of the Medicine and Physiology of Sports and Athletics at Helsinki, July 17-18, 1952. Edited by M. J. Karvonen, M.D., Ph.D. (Pp. 229. \$3.) Obtainable from Suomalainen Kirjakauppa-Finnish Bookshop, Helsinki, Finland.

Delegates from 30 countries attended the conference whose proceedings are recorded here, and communications were received from the U.S.A., Finland, Belgium, Germany, Norway, Sweden, Italy, Greece, Czechoslovakia, Spain, Bulgaria, Japan, the Argentine, and Hawaii. Circumstances unfortunately prevented participation by any of the British representatives who had arranged to attend.

Finland provided many of the most valuable papers from the Institute of Occupational Health, Helsinki. These included one on menstruation in Finnish sportswomen, where it was concluded that exceptional nervous and physical strain of competitive events may disturb the normal menstrual cycle, but so slightly as to necessitate no limitations of activity in healthy well-trained women.

In a paper on the course of delivery of Finnish baseball players and swimmers no obstetrical disorders of any kind were identified; better development of abdominal muscles appeared to be of advantage.

Elbow injuries in javelin-throwers were discussed in another paper; all traumatic changes were found to be extra-articular, the structures injured including the capsule, ligaments, and the tip of the olecranon. These injuries occurred during the first year of competition, compelling a period of rest: later, activity could be resumed free from pain, presumably because of insensitiveness of the injured part.

The effects of heavy muscular work on the mineral composition of sweat were discussed, and no significant difference was found between champion athletes and sedentary men at rest. Hard muscular work caused a decrease in the Na and Cl concentration of thermal sweat in the physically fit, who were regarded as possessing much larger reserves of the adrenocortical function. It was suggested that sweat might be analysed as a check on an athlete's progress during training. A significant drop in the eosinophils and lymphocytes was related in another paper to the adrenocortical mechanism and to changes in water balance.

As to E.C.G. investigations in athletes, variations from the normal were found to provide no indication of pathological states. Electroencephalography and head injuries in boxers was a subject exhaustively discussed by E. Jokl, who is perhaps the greatest authority in the world on the physiology and pathology of exercise. Other interesting papers

included an elaborate synopsis of the psychological and physiological changes in physical training from Professor T. Cureton, of Illinois.

The value of ascorbic acid in minimizing post-exercise soreness and stiffness was advanced in a paper from the U.S.A. It was agreed, however, that no convincing evidence of any such biological attribute of vitamin C was forthcoming in relation to this familiar disability, which appears to be an aseptic tissue inflammation. Well-controlled observations, also reported from the U.S.A., were said to have failed to identify any benefit from the effect of glucose or blood alkalizers upon competitive endurance performance.

In a paper from Spain on the respiration value in sportsmen pulmonary capacity alone was concluded, as expected, to be no guide, since oxygen transport is an elaborate co-ordination of respiratory, circulatory, and metabolic interchanges. Selye's general adaptation syndrome was introduced in papers on muscular exercise (Belgium) and sports injuries (Germany).

ADOLPHE ABRAHAMS.

HUMAN SENSES

The Human Senses. By Professor Frank A. Geldard, Ph.D. (Pp. 365; 104 figures. £2.) New York: John Wiley and Sons, Inc. London: Chapman and Hall. 1953.

No English publication attempts to cover the ground of this book—that is, to bring within the covers of one book the anatomy, histology, physiology, and psychology of the senses. It contains fifteen chapters, including an introduction, and a bibliography of 330 references. There are four chapters on visual sense, three on auditory, four on cutaneous, and one each on labyrinthine, olfactory, and gustatory senses. In the account of each sense the physical nature of the stimulus is described and then the anatomy of the organ. An excellent account of the observed phenomena follows. Not only is the physiology treated as a simple straightforward account of functional findings, but it is also interpreted in terms of general physiology and biophysics.

The author recounts the current (but not the older) theories of perception and gives a few instances of the applications to problems arising out of Service conditions in the war.

This straightforward account makes the book useful to the more intelligent undergraduate student or doctor wanting to refresh his mind with up-to-date knowledge. The avoidance of discussion on the growing points of the subject—the parts where polemics exist—makes the book unobjectionable for the Honours or Part II Tripos student. It has a good account of the early German and the modern American literature, but except for that of a few outstanding European workers it is weak otherwise.

A. ST.G. HUGGETT.

BRONCHIAL CARCINOMA

Das Bronchuscarcinom. By Dr. G. Salzer, Dr. M. Wenzl, Dr. R. H. Jenny, and Dr. A. Stangl. (Pp. 143; illustrated. £6 13s.) Vienna: Springer-Verlag. 1952.

This volume is a tribute to Professor Denk presented by members of the staff of the clinic who were his pupils. It is based on 1,200 cases of bronchial carcinoma admitted to the clinic for the period 1947-52 and treated by the Professor and his pupils. It is a fine example of what can be achieved by organization and collaboration even under the difficulties of life in Vienna at the present time.

The cases are described in full detail, and everything that could be learnt from clinical and pathological study is discussed and analysed. Particular attention is devoted to the use of tomographs in radiodiagnosis and to bronchoscopy, and the conclusion is reached that by these two methods the question of operability can be decided in the great majority of cases. The view is expressed that in doubtful cases it is better to carry out a radical operation, since with modern procedures recovery is rapid and the results well worth the risk taken.

For those who can read German the whole volume is worthy of the closest study, but for those who have not that facility the second half of the book can be of value. Here are gathered together radiographs, tomographs, and pathological photographs of typical cases from which one can learn much of the diagnosis, progress, and treatment of bronchial carcinoma. The whole forms a pictorial manual of real value in the study of one of the most important problems of surgery at the present day.

HENRY SOUTTAR.

AMOEBIASIS

Amoebiasis: Pathology, Diagnosis and Chemotherapy. By Professor Hamilton H. Anderson, M.D., Warren L. Bostick, M.D., and Professor Herbert G. Johnstone, Ph.D. (Pp. 431; 48 figures. 83s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

In this book the authors "attempt to present the environmental background, modern methods for detection, and modern methods for control" of amoebiasis, which, they consider, is of increasing importance in temperate as well as in tropical climates. It may fairly be stated that this object has been accomplished if by this it is meant that the literature on these subjects has been reviewed and summarized. A vast amount of information is presented to the reader, but it is seldom critically appraised, so that some sections are little more than bibliographies. The danger which amoebiasis constitutes to populations in temperate regions is perhaps exaggerated, and many of the statements made will not go uncontested by the majority of physicians with tropical experience. Thus, the authors say that "approximately half of the cases of amoebic colitis can be detected by the use of the sigmoidoscope. The remainder, namely those involving the caecal area, can be more easily detected by the use of barium enema together with other roentgenographic studies."

Confusion results from failure to distinguish between emetine hydrochloride for parenteral use and emetine bismuth iodide for oral administration. In the preface the authors remark that "the British still contend that emetine is useful, despite the fact that accumulated evidence in the United States denies this contention." If by emetine they mean emetine bismuth iodide, few will agree that this drug is no longer useful, whereas if intramuscular emetine hydrochloride is meant the statement will again be contested on the grounds that the British do not, and have not for the past decade or more, considered that it alone is adequate for treating amoebic dysentery. Standard British practice has been to give no more than two to three injections of 1 gr. (65 mg.) each as a preliminary to a course of emetine bismuth iodide. Though in the United States emetine derivatives have largely been replaced by antibiotics for the treatment of amoebiasis, and many favourable reports of their value in the disease have been made, it is clear that a high proportion of these, particularly those concerning aureomycin, are more favourable than has been justified by subsequent events. It is now known that the relapse rate after treatment with this drug is very high. Thirty-five years ago Dobell reported a cure rate of 90% after the treatment of intestinal amoebiasis with emetine bismuth iodide, and his results have been confirmed by many subsequent observers. It now appears that few if any of the antibiotics can produce results as good as this, while a course of even the cheapest is very much more expensive than one of emetine bismuth iodide. Accumulating evidence is showing, therefore, that emetine bismuth iodide, far from being no longer useful, is still probably the most valuable drug in the treatment of the infection.

This is a book which research workers in the Tropics and those interested in protozoal infections will find invaluable as a review of the literature, but it is not one in which doctors unfamiliar with the disease can be sure of finding guidance or a clear enunciation of the principles which should govern their practice.

A. W. WOODRUFF.

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OBESITY

The quest for a successful treatment of obesity has always overshadowed the search for its causes; it is only of recent years that painstaking scientific investigation has thrown much light on aetiology. The first interest, outside that in gluttony, arose in the thyroid gland, and thence embraced all too uncritically many other glands of internal secretion, especially the pituitary and gonads. Hereditary obesity remained a puzzle, as it does to-day. The recent upsurge of knowledge sprang from a study of salt and water metabolism, and fluid retention was found on occasions to be responsible for persistent overweight even in those whose calorie intake was certainly small. It was noticed that this form arose chiefly in women and that fluid retention was most noticeable when they were active, whereas mere bed-rest would be accompanied often by diuresis and always by loss of weight—thus confirming in part observations by Leonard Williams nearly half a century earlier.

Few writers on obesity have failed to preface their observations by the statement that adiposity is essentially due to excess intake over output. Timely as this reminder is to most of our obese patients, yet it has not really explained many bizarre features of the problem. Why, for instance, do so many slim women become obstinately fat after childbirth? How is it that nervous shock, cranial injuries, and, in the old days, chloroform anaesthesia preceded and possibly caused a sudden increase of weight? Why does abstinence from smoking often lead to the putting on of weight? Increase of appetite is the immediate and correct answer, but at once calls forth a search for the mechanism that can account for psychic and organic factors producing a like result. Elsewhere in this issue Dr. J. H. Sheldon summarizes experimental and clinical evidence pointing to the important functions of the hypothalamus in weight control, and lays stress on the constancy of the time-weight pattern which is apparent in maternal obesity to those who trouble to look for it.

The general physician who is faced by a patient worried by increasing weight usually finds that co-operation is readily accorded, and all he has to do is

¹ *British Medical Journal*, 1864, 1, 99.

to prescribe the type of diet best suited for the patient's circumstances. Thus the young can well tolerate, even when active, a diet of 600 to 800 calories, composed of egg or lean meats and lettuces: quick results are obtained to the satisfaction of all concerned. The true starvation diet is wellnigh impossible to accept unless the patient be at rest, and is suitable only for those who can devote time for this purpose and who are free from cardiac disease. The patient who comes for advice about conditions other than obesity but who is urged by the physician to reduce the body weight will resent severe restriction of meals, but can be coaxed to more graceful contours by allowing one good meal a day only, or even by a generous regimen from which starch and fat are largely excluded.

It is as well that the doctor should be able to give convincing arguments in favour of weight reduction. Dr. H. M. Sinclair (p. 1404) stresses the undoubted fact that obesity shortens life and is accompanied by a high incidence of atherosclerosis, diabetes mellitus, gall-stones, arthritis, and other diseases. Fortunately the patient's difficulties have been simplified by the finding of agents which depress the appetite yet which engender a sense of well-being. Dexamphetamine used with discrimination has proved a boon to the obese, but it should never be given in the second half of the day lest it cause insomnia. Unfortunately there are some patients who are so sensitive to its cerebral stimulant action that it cannot be used.

Dr. Sinclair quotes from William Banting's *Letter on Corpulence*, written ninety years ago. Mr. Banting weighed 202 lb. when he began dieting and a year later weighed 156 lb. His girth meanwhile had lessened by 12½ in. The *British Medical Journal*,¹ giving the following outline of his diet, described it as "not untoothsome" (and, we might add, not entirely unsuitable for the festive season):

"For breakfast, four, or five ounces of beef, mutton, kidneys, boiled fish, bacon, or cold meat of any kind except pork, a large cup of tea (without milk or sugar), a little biscuit, and one ounce of dry toast. For dinner, five or six ounces of any fish but salmon, any meat except pork, any vegetable except potatoes, one ounce of dry toast, fruit out of pudding, game or poultry; two or three glasses of claret, sherry, or Madeira, but neither champagne, port, nor beer. For tea, two or three ounces of fruit, a rusk, and a cup of tea without milk or sugar. For supper, three or four ounces of meat or fish (as above), and a glass or two of claret; and, if required, a tumbler of grog for a 'nightcap,' or another glass or two of claret or sherry. (Soak the rusk in spirits, if you please.) In fact, avoid sugar-containing foods."

William Banting's achievement of the miraculous by common-sense means should still be our guide.

THE NEPHROTIC SYNDROME

The nephrotic syndrome is characterized by oedema, often sufficiently marked to constitute anasarca, heavy albuminuria, and a decrease in the concentration of plasma albumin. Usually there is an increase in serum lipids, the blood cholesterol exceeding 500 mg. per 100 ml., and often neither hypertension nor nitrogen retention. This clinical picture may be caused by several different diseases. It may occur during the course of glomerulo-nephritis, in diabetes mellitus complicated by intercapillary glomerular sclerosis (Kimmelstiel-Wilson syndrome), in syphilitic nephrosis, in amyloidosis of the kidneys, after thrombosis of the renal veins, and after poisoning by various drugs, such as troxidone. In some cases, especially children, no underlying cause is apparent and the duration of the disease varies from weeks to years: there is a particular liability to infection and remissions, several of which may occur before the albuminuria finally ceases, the anasarca clears, and the patient remains permanently well. It is this complete recovery with absence of residual renal damage that distinguishes this so-called true (or lipid) nephrosis, which some authorities are loath to accept as a disease *sui generis*, from the nephrotic stage of glomerulo-nephritis.

In addition to the disagreement about the aetiology of the nephrotic syndrome, there has been much discussion and speculation on the cause of the oedema. As long ago as 1896 Starling¹ showed that the factors controlling the transfer of fluid across the capillary wall are the hydrostatic pressure of the blood in the wall, the hydrostatic pressure of the blood in the capillary tending to force fluid out; the colloid osmotic pressure of the plasma proteins tending to hold the fluid in; the integrity of the capillary wall, which prevents the loss of plasma protein to any great extent, thus conserving the colloid osmotic pressure of the plasma; and the pressure in the interstitial space. In 1917 Epstein² suggested that the oedema of the nephrotic syndrome was secondary to the reduced colloid osmotic pressure consequent upon the decreased concentration of plasma proteins. The lowered plasma protein concentration was attributed to the heavy and continuous proteinuria. This explanation had much to recommend it, but it does not entirely fit the observed facts. A marked and prolonged diuresis has been seen to occur without any measurable increase in the serum albumin level. Often the diuresis is spontaneous, but sometimes it

follows an infection, and in recent years this has led to attempts to induce a diuresis by infecting the patient with measles or malaria.

Current interest in electrolyte metabolism has led to the suggestion that sodium and water retention are important factors in the causation of nephrotic oedema. In animals the concentration of plasma albumin can be severely reduced without oedema appearing provided sodium is eliminated from the diet; oedema appears promptly as soon as salt is given. Certainly nephrotic oedema can be partially reduced by sodium restriction, but this is common to practically all types of oedema, and it is generally conceded that oedema fluid cannot accumulate without concomitant salt retention. Sodium retention and consequent water retention could hardly explain the hypoalbuminaemia unless there were considerable haemodilution and expansion of the vascular compartment, and these are not present.³ Thus it has seemed most likely that hypoalbuminaemia is the major cause of oedema, but because quantitatively the loss of protein in the urine does not always appear to be sufficient to cause hypoproteinaemia it has been suggested that in the nephrotic syndrome the synthesis of protein in the body is impaired.

In our opening pages this week we publish a paper by Professor Squire, who with his colleagues in Birmingham has been studying the nephrotic syndrome with a commendable originality of mind and method. Since his report is a review of three years' work, of necessity it lacks some of the details which would allow a complete critical appraisal. Professor Squire first turns his attention to the mechanism of oedema formation and considers in turn the various factors influencing the transfer of fluid across the capillary wall. He confirms that the osmotic pressure of the oedema fluid is low, indicating that the capillary wall is not abnormally permeable. A new instrument has been used to study the relationship between the concentration of plasma proteins and the osmotic pressure they exert. Contrary to expectation, the relationship is not linear but curved, with the result that in normal serum small changes in the protein concentration are accompanied by considerable changes in osmotic pressure. No explanation is offered for this observation, which shows that with a plasma protein concentration of 7 g. per 100 ml. the osmotic pressure is twice that predicted from the molecular weight of the plasma constituents. Thus in a normal subject loss of fluid from the capillaries will cause an increase in plasma protein concentration, and, such is the relationship between plasma protein concentration and osmotic pressure, there will be a considerable increase in osmotic pres-

¹ Starling, E. H., *J. Physiol.*, 1896, 19, 312.

² Epstein, A. A., *Amer. J. med. Sci.*, 1917, 154, 638.

³ Steinbeck, A. W., *Clin. Sci.*, 1953, 12, 327.

⁴ Peters, J. P., *Amer. J. Med.*, 1952, 12, 66.

⁵ Rather, L. J., *Medicine*, 1952, 31, 357.

⁶ Farr, L. E., and MacFadyen, D. A., *Amer. J. Dis. Child.*, 1940, 59, 782.

⁷ Luetscher, J. A., et al., *J. Amer. med. Ass.*, 1953, 153, 1236.

sure, which will oppose the loss of more fluid. This sensitive regulator for adjusting the movement of fluid into and out of the capillaries is impaired in nephrosis. Not only is the colloid osmotic pressure much reduced, as would be expected from the low plasma protein concentration, but the steepness of the gradient relating osmotic pressure to plasma protein concentration is flattened. The patient with nephrotic plasma loses fluid from the capillaries, and a much larger fluid shift than normal can occur before there is a sufficient rise in osmotic pressure to oppose the fluid loss.

Another factor concerned in the transfer of fluid across the capillary wall is the pressure in the interstitial space. The original concept of Starling has required modification, since it has been shown that the interstitial space is largely occupied by a colloid gel, the ground-substance. This gel has an affinity for water and tends to draw water out from the capillary and to resist its reabsorption. This "swelling pressure" of the gel is reduced from a theoretical negative value to zero if the gel's affinity for water is fully satisfied. The arrival of more fluid from the capillary then results in a collection of free water lying in the interstitial space and the appearance of oedema. In nephrosis the gel is saturated with water and no longer exerts any pressure to oppose the tendency of fluid to shift to and from the plasma.

Professor Squire finds good correlation between the degree of proteinuria and the protein concentration in the plasma. He confirms that the proteins present in the urine are lost in accordance with their molecular weight, and that albumin with the lowest molecular weight is present in the greatest amount. In the plasma the total amount of protein and the albumin fraction fall in parallel until the albumin level reaches about 1.5 g. per 100 ml. Thereafter there is no further decrease in the total protein concentration, although the albumin may fall as low as 0.5 g. per 100 ml. The total protein concentration is maintained by an increase in globulins of high molecular weight, and it is possible that these to some extent sustain the plasma colloid osmotic pressure.

Although Squire considers the hypoalbuminaemia the most significant factor contributing to oedema formation and has confirmed that elevation of the plasma osmotic pressure by infusing salt-free albumin or dextran may cause a diuresis, he also finds, as other workers have done, that a spontaneous diuresis may occur without any measurable increase in the plasma protein concentration. He points out, however, that the plasma volume is decreased, and that any increase in circulating albumin would probably cause an increase in plasma volume rather than an increase in

albumin concentration. His data indicate that a gradual increase in plasma volume does occur before diuresis sets in. This finding will be welcomed by those⁴ who believe that a reduction in plasma volume despite normal plasma tonicity leads to retention of salt and water in an attempt to restore the depleted vascular compartment.

Professor Squire then turns his attention to the nature of the renal lesion. By infusing albumin intravenously a novel technique has been evolved for measuring renal protein-clearance. In all patients there was a glomerular defect whereby many of the "pores" in the glomerular membrane were sufficiently enlarged to allow the escape of proteins with small molecular weights (for example, albumin) and a few more enlarged to allow the passage of larger proteins (for example, globulin). In normal subjects the small amount of protein which crosses the glomerular membrane is reabsorbed in the tubules.⁵ In some patients with nephrosis there is evidence of tubular inability to reabsorb proteins, and further evidence of tubular dysfunction was confirmation of the finding of Farr⁶ that there may be a considerable loss of amino-acids in the urine.

Squire's work re-emphasizes the importance of a high-protein diet in the treatment of patients with the nephrotic syndrome. Some patients show evidence of increased ability to synthesize protein and they must be given the raw materials to make good the protein and amino-acids lost in the urine. Although infusion of salt-free albumin (which is not generally available) or dextran usually causes only a temporary diuresis, repeated infusions of dextran may clear the oedema, and further investigation is necessary to discover which patients will respond to this form of treatment. Another promising line of treatment, particularly studied in the U.S.A., is the administration of A.C.T.H. or cortisone. Luetscher⁷ and his colleagues have treated 42 patients with these hormones and obtained satisfactory results in nearly half. But they are careful to point out that the natural course of the disease is so variable that no definite conclusions can yet be drawn.

THE SMALLER THE BETTER?

Behind the dissatisfaction with wages that was the main reason for the recently threatened railway strike some observers have thought they saw another cause of unrest—namely, a lowering of morale as a consequence of the large-scale amalgamation wrought under nationalization. If contentment has indeed ebbed somewhat, that is no criticism of nationalization as such, but of the size of the new organization,

and huge industrial concerns have been created without State intervention. The idea that men may work better and also be more contented in a small organization than a large one is not new. It is common belief that to be a member of a small firm increases the individual's sense of importance and purpose, and inspires a loyalty to the firm which is lacking, or at least not so conspicuous, in a vast industrial concern. Large organizations are advocated by their supporters on economic rather than on social grounds. But until recently there has been little scientific study of the proposition that industrial morale is associated with the size of the industrial unit. Marriott¹ found in two motor-car factories a slight but definite decrease in output with increase in size of the working group from fewer than 10 to 50 or more workers. A survey by the British Institute of Management² showed lower rates of labour turnover in small than in large factories. Hewitt and Parfit³ found that absence rates in a hosiery factory, both from sickness and from other causes, were greater in the larger working units. Each of these studies seems to point to lower morale in the larger group.

The Acton Society Trust has now initiated an inquiry into the whole subject and given some preliminary results from a variety of sources.⁴ Two industrial concerns (one of which is the coal industry) and a commercial organization have been studied. In the coal industry there were definite associations between the number of miners working in a pit and attendance records, accident rates, and improvements in output between 1949 and 1950. For each measure the figures tended to be less satisfactory in the larger pits. So far as could be judged from the available evidence, morale was not associated solely with the size of the pit, but also with the number of miners working in a seam, and with the number under the immediate control of a single supervisor. A similar inquiry was made into lost-time records in an industrial group with nearly 100 separate units ranging in size from 8 to 11,000 male employees. Certified-sickness and accident rates, and absences from other causes, all increased with size of the industrial unit, but it was a surprise to find no corresponding relationship between absence without leave and size of unit. Of all forms of absence, this might have been expected to reflect morale more clearly than any other. When the commercial organization, which controls 230 stores throughout the country, was

studied, a much slighter connexion was found between size of store and absentee rates, and there were other differences between the pattern of absence in the commercial and in the industrial field.

There are enough anomalies in these preliminary findings for it to be clear that the Trust has so far touched only the fringe of an interesting subject; there is also no doubt of its complexity. For example, other investigators have found that bacterial contamination of the air,⁵ and the incidence of specific diseases^{6,7}—notably tuberculosis—are greater in workrooms containing large numbers of people than in smaller rooms, and it is understandable that this should be so for infectious diseases. But this specific association adds considerably to the difficulty of using records of sickness absence as an indicator of morale in relation to size of industrial unit. Again, as the Trust is already aware, the "size" of an industrial unit is a vague concept; it may mean the number of men in a compact working group under a single supervisor, the number in a single workroom, the number doing a specific job, or the number employed in the whole organization.

To discover the social psychology which is at the root of the broad tendencies that have already been observed will be a slow and laborious study and call for considerable research ability. Yet the findings should have valuable practical applications. It should prove possible to alleviate, if not to remove, some of the social disadvantages of the large organization without sacrificing its economic advantages. This may be expected to increase output and thereby contribute to the solution of the continuing economic difficulties which face Britain. But in addition it should make life and work more tolerable, more interesting, more worth while for many people caught in the complexities of modern society, and to the doctor that is at least as important an aim. The Acton Society Trust is to be congratulated on the start it has made in investigating this problem, and the later reports will be awaited with interest.

CARBOMYCIN

We referred a year ago to the introduction into therapeutics of erythromycin,¹ a new antibiotic with a range of activity resembling that of penicillin, although quite distinct from it in other ways. This discovery has been closely followed by that of carbomycin (magnamycin), first reported from the laboratories of Chas. Pfizer & Co. by Tanner and his colleagues.² Accounts of its activity *in vitro* and in the treatment of experimental infections have since been given by English and his colleagues.^{3,4} Like erythromycin, it is highly active against many Gram-positive bacteria, including streptococci, pneumococci, staphylococci, and diphtheria bacilli.

¹ Marriott, R., *Occup. Psychol.*, 1949, 23, 47.
² British Institute of Management, *Labour Turnover Analysis*, London, 1949.
³ Hewitt, D., and Parfit, J., *Occup. Psychol.*, 1953, 27, 38.
⁴ Acton Society Trust, *Size and Morale. A preliminary study of attendance at work in large and small units*, London, 1953.
⁵ Hirsch, A., *Brit. J. Industr. Med.*, 1951, 8, 8.
⁶ Stewart, A., and Hughes, J. P. W., *British Medical Journal*, 1949, 1, 926.
⁷ Acheson, F., and Hewitt, D., *Brit. J. soc. Med.*, 1952, 6, 68.

The only sensitive Gram-negative organisms belong to the two fastidious and delicate genera also exhibiting susceptibility to penicillin—namely, *Neisseria* and *Haemophilus*. Minor differences are that *Str. faecalis* and *N. catarrhalis* are highly sensitive to carbomycin, whereas to penicillin they are usually less so than their cousins. It was evident from the original papers on erythromycin and carbomycin that their range of activity was similar, but the work of Finland and his colleagues⁵ has shown that the relationship between the two antibiotics is close. They tested the sensitivity of 74 strains of various species of bacteria to both, and thus demonstrated a common range of activity—that is, the relative susceptibility of different species to the two was constant, although there were some absolute differences, the minimum inhibitory concentration of erythromycin often being lower. Further, there was invariable cross-resistance between them, an organism made resistant to one becoming equally so to the other. This relationship has been confirmed by Fusillo and his colleagues.⁶ These two antibiotics even share the peculiar property of rendering staphylococci coagulase-negative when resistance is acquired *in vitro*. This means that for dealing with staphylococcal infections resistant to other antibiotics—perhaps the most serious problem in the future of chemotherapy—we have not two further lines of defence but for practical purposes only one. Unfortunately resistance to these drugs can not only be induced readily *in vitro*, but has been observed to develop *in vivo* during the treatment of obstinate infections such as bacterial endocarditis.

Clinical evidence of the efficacy of carbomycin has hitherto been scanty, but two recent reports of clinical trials, although their conclusions are not in close agreement, enable this drug to be seen in better perspective. Finland and his colleagues⁷ review earlier findings, recapitulate the results of *in vitro* tests showing that carbomycin is less active than erythromycin, and describe the treatment of 45 cases of pneumonia with carbomycin. A prompt response such as is usually obtainable with other antibiotics occurred in only six: pneumococci often persisted for several days in the sputum, and persisted in the blood of five out of seven patients who initially had a bacteraemia. Two patients actually developed meningitis, and in 12 it was necessary to abandon the treatment and resort to penicillin. Very low drug concentrations were attained in the blood, and sometimes none could be detected. Hewitt and Wood, of Los Angeles, confirm that blood concentrations are low except after intravenous administration, and find that remarkably little of the drug appears in the urine (1% or less of an oral dose, and 2.5% of an intravenous dose), but their results in a smaller series of cases of pneumonia were better. They specifically state that the rate of improvement, as judged by several criteria, was equivalent to that observed after treatment with other antibiotics, and also that pneumococci disappeared from the sputum of all but 1 out of 12 patients within

forty-eight hours. The effect of carbomycin was also uniformly good in acute tonsillitis: in severe staphylococcal sepsis it was disappointing, and in bacterial endocarditis a failure. Five patients with amoebiasis responded well. It has also to be remembered that this drug is effective, to a degree which has yet to be clinically assessed, in infections due to rickettsiae and some of the larger viruses. The general impression left by these findings is that carbomycin has a limited sphere of usefulness, perhaps not yet fully defined, and that as a substitute for penicillin in coccal infections it is inferior to erythromycin.

EMOTIONAL REACTIONS

For about the last 50 years attempts have been made to measure emotional reactions to psychological stress stimuli. The instruments used have included the pneumograph, the sphygmomanometer, the skin galvanometer, and, most recently, the electroencephalograph and electromyograph. Some of these techniques, in the popular press and in courts of law, have become glorified with the name of lie detectors. Such sensational applications are almost automatically suspect, for all that these methods can show is the occurrence of emotional changes; they cannot show what was the nature of the emotional change or what was its relation, in terms of ideas, with the psychological stimulus which had called it out.

Even so, the techniques already available may provide clues in the individual case which will be helpful in psychological and psychiatric investigation. One of the latest of them is also one of the more interesting. Newman¹ has reported the use of the electroencephalograph for purposes of electromyography. It had been previously observed² that, in word association tests, stimulating words were associated with depression of the alpha rhythm of the E.E.G. Newman's interest was not in alterations of the alpha rhythm occurring during a word association test, but in variations of the amplitude, frequency, and duration of muscle action potential: in leads from the scalp. During the test the subject was not required to answer to test words, but only to lie relaxed on the couch and to listen. It was found that stimulating words brought out muscle spikes appearing in bursts of rapid oscillation owing to action current in the scalp muscles. The subject was unaware of this effect and showed no outward sign of emotion. The volunteers were asked afterwards to comment on the words which had brought out these signs of emotion and in some cases were able to recall affectively tone experiences in their past lives which had some connexion with them. Others were not able to recall anything relevant.

In a second series, the subjects were asked to name any object or situation which was particularly distasteful to them: or one that aroused a feeling of passion, revulsion, or horror. These incidents were then described by the operator in a way to build up a vivid emotional picture. One young woman who had a particular horror of spiders was given the series of suggestions that she saw a spider on the wall, that

suddenly jumped on to her leg, crawled on to her arm and neck, that it was big and hairy, that she was unable to brush it off, and finally that it was dead and out of sight. The subject showed no visible sign of emotion, except on the electromyographic record; and pulse and respiration rates were constant throughout the experiment. Similar results were recorded from other subjects.

From these experiments it seems likely that electromyography, probably best when applied to the scalp muscles rather than the neck, trunk, or limbs, provides a sensitive instrument for detecting emotional changes. It may also provide means of measuring them, since variations in amplitude, frequency, and duration of the muscle discharge are easily read off from the record. For really useful application in the problems of clinical psychiatry it would be desirable to find out what are the emotions likely to produce changes of these kinds, and whether they are only those of horror and fear. As Newman comments, the value of the method in clinical diagnosis will depend on the development of a systematic technique; and the work, which has so far been restricted to normal subjects, could well be extended to patients suffering from psychiatric abnormalities of many kinds.

LENGTH OF AMPUTATION STUMPS

Amputation of a limb was originally a life-saving measure, and the mutilation was accepted by both the patient and the surgeon when a cure was impossible. It was not until the campaigns of Napoleon that wounded limbs were amputated in large numbers and often for preventive purposes. Larrey, to prevent gas gangrene, performed one thousand amputations after the Battle of the Nile, and it is reported that most of the men survived, while those treated by his more conservative colleagues nearly all died. The satisfaction with life left surgeons little time for dissatisfaction with their surgery, and the limb-makers were individualists who were in general content to provide end-bearing peg legs—though some were capable of magnificent work, as shown in the iron hand of Gotz von Berlichingen made to replace a hand lost in battle in 1504. This system underwent little change until 1914. The sudden demands placed on the limb-makers as a result of the work done at Roehampton Hospital during and after the first world war brought about the needed close co-operation of surgeon and limb-fitter. At Roehampton, where 41,000 patients who had had a limb amputated were treated, and at other limb-fitting centres, the individual responsibilities of the limb-maker and surgeon were fused together under the Ministry of Pensions. Experimental studies were carried out first in the Ministry of Munitions inventions department and then at Roehampton. Experience soon established minimum and maximum length of stumps to which limbs could be successfully fitted. Wooden legs of a standard pattern for below-knee amputations were first introduced in 1921. Standard patterns for other amputations followed.

With the development of standard limbs based on functional and economic factors the demand for standard stumps to fit them inevitably arose. Wider experience showed that certain amputations were eventually followed by deformity or the breakdown of skin due to a combination of factors—muscular imbalance, circulatory deficiencies, and appliance pressure. All these were carefully analysed by Muirhead Little¹ in 1922, and his evidence resulted in the discredit of certain amputations. Stephen Smith's suggestion that the menisci should be left in the stump to cover the end of the femur was due to the use of the end-bearing stump. In the Gritti-Stokes operation the patella is used for a similar purpose. Both amputations failed, since the stump was too long. Syme's amputation through the lower ends of the tibia and fibula had an average life of seven and a half years, though some patients did manage to bear weight on the end for up to sixteen years. Some of the defects of Syme's stumps were in fact due to sepsis, and the clean Syme's amputation has possibilities which English surgeons still find attractive. The Pirogoff, Lisfranc, and Chopart stumps all showed similar disadvantages. End bearing had to be largely discarded as being too impermanent.

European surgeons from countries which are members of the Brussels Treaty Organization—namely, Britain, Belgium, France, the Netherlands, and Luxembourg—have discussed the length of amputation stumps earlier this year at a meeting in Utrecht of the Prosthetic Working Party Subcommittee. General agreement with British experience was voiced. Above-knee stumps should be 10–12 in. (25–30 cm.) in length from the top of the great trochanter, below-knee stumps 5½ in. (14 cm.) from the inner edge of the tibial plateau. Minimum lengths were 6 in. (15 cm.) in the femur and 2 in. (5 cm.) in the tibia. No other country than Britain favoured the Syme's amputation, and Netherlands surgeons alone thought a Pirogoff or Lisfranc should be occasionally considered. No country favoured disarticulation at the hip, and Britain alone advocated disarticulation at the knee in selected elderly patients and in children. The ideal upper-arm stump measured 8 in. (20 cm.) from the tip of the acromion and the lower-arm stump 7 in. (18 cm.) from the tip of the olecranon. The Netherlands alone favoured occasional amputation from the wrist.

The influence of stump length is primarily on the type of prosthesis and its control. Standard lengths enable the most efficient limb—functionally and aesthetically—to be worn and so simplify limb-fitting. Surgeons faced with amputation must, when circumstances permit, have these lengths in mind and conform to them where possible. Even a naturally conservative surgeon must accept the fact that a good below-knee amputation is better than a bad Syme or Lisfranc. From the patient's point of view, standard stump lengths do not necessarily mean stump comfort, and great care must be devoted to the site of the scar, preservation of healthy skin, sound healing, and stump bandaging and control if prosthetic discomforts are to be avoided. Stump lengths are easily memorized, though stump scars may not be so easily forgotten by the patient.

¹ British Medical Journal, 1952, 2, 1085.

² Antibiot. and Chemother., 1952, 2, 441.

³ Ibid., 1952, 2, 678.

⁴ Ibid., 1953, 3, 94.

⁵ Proc. Soc. exp. Biol. (N.Y.), 1952, 81, 725.

⁶ Antibiot. and Chemother., 1953, 3, 581.

⁷ New Engl. J. Med., 1953, 249, 310.

⁸ Ibid., 1953, 249, 261.

¹ Newman P. P. J. Neurol. Neurosurg. Psychiat., 1953, 16, 200.

² Liberson, W. T., Dis. Neurol. Psychiat., 1945, 13, 594.

¹ Artificial Limbs and Amputation Stumps, 1922, London.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

EVIDENCE OF GOUT

BY

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Gout has been a recognized disease since the beginning of the civilized world. It was described as podagra by Hippocrates in the fifth century B.C., long before chemical pathology had been envisaged. It has been an accepted fact up to the present day that the history and signs of gout are far more important in the diagnosis than any pathological estimation.

Gout occurs predominantly in males after puberty and much more rarely in females at or after the menopause. The typical story is of an acute onset first in a big toe and later in other joints, often at night, with excruciating pain developing in a few hours. Intense pain is the hallmark of gout and has led to many colourful descriptions, such as "tearing the joint asunder," and the well-known quotation of Sir Thomas Watson: "Place your joint in a vice and screw the vice up until you can endure it no longer—that represents rheumatism; then give the instrument another twist and you will obtain a notion of gout." The site of the attack gives a classical appearance, with the skin for some distance around the affected joint rapidly becoming shiny, bright red or mauve in colour, but remaining dry, and with distension of the neighbouring veins. Early attacks occur commonly in spring and autumn and are usually confined to the metatarso-phalangeal joints of the big toe but may later spread to almost any joint in the body.

A description of such an attack, which may be brought on for the first time by local injury or an operation, will lead to a diagnosis of gout without supporting pathological evidence. When the attacks are atypical, or when treatment has been applied without relief, further evidence of the disease may be sought with the aid of the pathologist.

Plasma Uric Acid

The pathological evidence most frequently required by the doctor to support a diagnosis of gout is an estimation of the uric acid in the blood or serum. Garrod in 1848 showed that the blood of gouty subjects contains abnormal amounts of uric acid, and to demonstrate this he devised the "thread experiment": when a thread is placed in the blood of such a patient the sodium urate crystallizes and adheres to it. In 1913 Folin introduced a reliable method for determining the uric acid content of the blood, and modifications of it are used to-day by most laboratories, though the uric acid content of the serum is now more often estimated. This is preferred by pathologists because anticoagulants tend to produce errors in the test. The estimation can be carried out by most laboratories. For serum estimations the pathologist requires 10 ml. of venous blood collected in a plain bottle. Your local laboratory may prefer the blood in oxalate bottles and it would be as well to inquire about this point.

Difficulties of Interpretation

There are certain points about the significance of the plasma uric acid estimation which should be understood by any doctor using this test as an aid to diagnosis in gout. The figures given for a normal level of uric acid in the blood vary from textbook to textbook and from laboratory to laboratory, and unless the normal figures are indicated in

the result the practitioner should ask the pathologist for them. Most textbooks in this country give a figure of 5 mg. per 100 ml. of blood as the highest normal, and the American normal figures of below 5 mg. per 100 ml. for women and 6 mg. per 100 ml. for men for the serum uric acid are regarded as too high by most British pathologists.

Another difficulty is that the level varies from day to day, and even in cases of gout a normal figure may result from an isolated estimation. It is suspected that a normal figure is more likely to occur in this disease during or immediately after an attack, though this is by no means proved. One reason may be that during an attack the patient is often given salicylates, which cause an increased urinary output of uric acid and so a lowered blood level. The reason for changes in blood uric acid levels is not properly understood because the mechanism of urate metabolism is still not clear. Recent work with isotopically labelled uric acid which has been injected intravenously into normal and gouty subjects has shown that there is a pool of uric acid spread throughout the body. The size of the pool in the normal subject is about 1,200 mg. and in gouty patients may be fifteen times as high as this. In the normal man 50 to 75% of the uric acid in this pool is replaced each day. Such studies may in time explain the variation in blood uric acid which occurs from day to day.

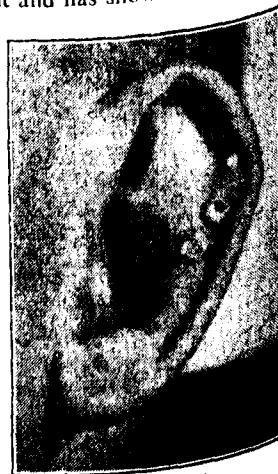
Although isolated estimations in gout may give a normal figure, in most cases the blood level will be raised enough to support the diagnosis. Hench has stated that an abnormally raised figure is found at some time in 75% of cases.

Other Causes of Hyperuricaemia

One of the curious anomalies of this disease is the fact that the high level of uric acid in the blood has apparently no connexion with the attacks of gout. If in fact uric acid is injected either into a vein or into a joint it will not produce an attack. Other causes of hyperuricaemia are leukaemia, polycythaemia, lead-poisoning, and chronic nephritis. In none of these are attacks of gout common, though they have been reported in both leukaemia and polycythaemia. It has also been shown that hyperuricaemia is a familial condition and that in such families the level of uric acid in the blood rises at puberty in the males and at the menopause in the females. Stecher, of Cleveland, has made a careful study of the hereditary aspects of gout and has shown that hyperuricaemia is a common finding in the families of patients with gout, though in fact many members may never suffer an attack in the whole course of their lives.

Tophi

One of the clinical findings in long-standing cases of this disease is the appearance of deposits of urates in articular, peri-articular and subcutaneous tissues and in bursae. They occur most often upon the helix or antihelix of the ear and less commonly in the olecranon and prepatellar bursae and in the tendons



Gouty tophi.

of the fingers, wrists, toes, ankles, and heels. They may break down and ulcerate, discharging a white chalky material which can be identified by the recognition of the typical needle-like crystals of monosodium biurate under the microscope.

Tophi can also be identified chemically by the murexide test, which is carried out as follows. Heat the removed contents of the tophus with five drops of dilute nitric acid until evaporation is complete; a reddish residue remains (alloxan); add a few drops of ammonia solution to the residue when cool; the result is a purplish red colour owing to the formation of ammonium murexide.

Other Tests

The sedimentation rate is raised during an attack of gout, but as this rate is raised in so many conditions it is of no particular help in diagnosis. There is a moderate leucocytosis during an attack, and unless this is recognized it may raise difficulties when a septic condition of the joint is suspected. Liver-function tests in gout have not shown any constant impairment and are of no value in diagnosis.

In conclusion, the history and clinical findings form the basis for a diagnosis of gout and are more important than any laboratory investigations. A raised level of uric acid in the blood or serum will support a diagnosis, but a normal result does not necessarily exclude it. The severity of an attack can be better judged by the physical appearance and the degree of pain than by chemical data.

Next article on Clinical Pathology—"Blood Grouping," by Dr. A. E. Mourant.

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PHYSIOLOGICAL CHANGES IN BLOOD IN THE ANTARCTIC A PRELIMINARY REPORT

BY

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During the Norwegian-British-Swedish Expedition to the Antarctic in 1949-52 I spent two years in Queen Maud Land as medical officer of the wintering party. While there I made continuous physiological investigations on the expedition members, who numbered 15 men the first year and 14 the second. My investigations included basal metabolic rates and blood tests, the intention being to register the changes that occurred during acclimatization to the Antarctic climate and then back to temperate conditions. The blood tests were begun at home, and, with minor interruptions, were conducted monthly throughout the two-year stay, even on long sledge trips into the interior during several months of field work, and during the sea voyage south and back again.

Difficulties

I soon realized that the planning of physiological research on a polar expedition to an unknown country with an adverse climate is one thing, and the carrying out of it under extreme and unexpected conditions is quite another.

Cramped quarters, limited resources, primitive working conditions, the small restricted number of test subjects, and, above all, the human factor in these persons made large-scale investigations impossible, especially as all the other scientific programmes had priority when time and assistance mattered. Because of the extreme and primitive experimental environments even normally simple tests became time-consuming. During tests solutions and pipettes had to be kept at temperatures quite different from that of the surrounding air, which was often near freezing-point.

Owing to the fact that all scientists on the expedition had to do their part as handymen during the building of the base and afterwards, the tests planned could be done only when time permitted. Those that were thought most important were started first. This procedure was also of psychological importance, as the impact of all the blood tests begun at once would certainly have been to dismay some of the members and make them hesitate in giving "such quantities" of blood. In the way it happened they were coaxed into one series of tests after another with suitable intervals, and in the end they were all willing, though grumbling, guinea-pigs.

During sledging trips, to carry out only red-cell and white-cell counts, blood smears, and blood-sugar estimations on four persons usually took 10 to 12 hours. Consequently such tests had to be made when weather prevented sledging and outdoor work, which of course increased difficulties still more. The morning air temperatures in the tent varied from -5° to -30° C. (20° to -20° F.) before heating with the primus stove; this necessitated the thawing of frozen solutions, and in addition there was constant condensation in glass tubes and pipettes. The struggle to get from one tent to the other in drifting snow and subfreezing temperatures with half-full test-tubes to take blood samples in the early morning from shivering comrades who had just got out of their sleeping-bags in a cramped and poorly lighted tent is fun to tell about—afterwards!

Scope of the Tests

The blood investigations included: red-cell count, haemoglobin content, adrenaline in blood, blood sugar (fasting), white-cell count (morning and afternoon values), and white-cell differential count. The tests were made monthly, sometimes oftener, with three interruptions: (1) during landing operations and the month during which the base was established no tests could be done; (2) during the first summer's field work all tests at base were discontinued, as I went sledging inland for four months; however, while sledging I continued making regular blood tests on a small field group; and (3) during the second summer's field work tests were similarly discontinued for one month.

To avoid the influence of the prevailing extreme working conditions much trouble was taken to standardize the tests in every detail. As the same person did the tests all the time, the personal bias in colorimetric readings and laboratory operations can be disregarded. The morning tests were taken between 7.30 and 10 o'clock, and the afternoon tests between 4 and 6 o'clock. To avoid the influence of the daily variations in blood cells the tests on each particular individual were taken approximately the same hour every time, the procedure being made easier by the divergent times of getting up in the morning owing to the different personal jobs.

Samples were always taken from the ear-lobes, alternating between left and right, because wounds in finger-tips healed slowly and became painful. It was also more difficult to get blood from the finger-tips, which more often were cold and ischaemic because of the climate. For psychological reasons I did not take the blood samples on myself, but let them be done by any of my comrades who liked to try their skill. In this way some of them took a "cruel revenge" on their torturer, often inspired by the spectators' delighted remarks. Most of my comrades attained considerable skill in blood-letting during those two years.

Red-cell Count

The counts were made according to Ellerman's method. The number of red cells remained unchanged throughout the two and a half years. Only during summer field work inland in high altitudes did red cells react with a normal physiological increase, which showed that the method used was reliable. The men at the base at sea-level did not, of course, show this increase during summer.

Isachsen (1911) demonstrated in Norway a seasonal change in red cells with a maximum in the summer and a minimum in the winter. No such seasonal change was found by me in the Antarctic. The irregular red-cell changes shown by Frazier (1945), during Byrd's Antarctic Expedition, 1939-41, do not contradict my findings, as there is reason to believe that the red-cell variations shown in his curve are within the limits of experimental error.

Haemoglobin Content

Determination was made with a Zeiss haematometer. In spite of the red cells remaining unchanged in number, the Hb curve showed characteristic seasonal fluctuations. During both polar winters the Hb stayed at a high level, but when spring set in (September-October) the curve of both years declined steeply owing to increased outdoor activity. With greater muscular strain the Hb was used to form myohaemoglobin as musculation increased. This was also illustrated by the weight curve. Fat was first lost when outdoor activity started; the weight then went up as muscles increased during summer, and more fat was added during the second polar winter. Thus both Hb and weight curves became indicators of outdoor temperatures. This drop in Hb in the second spring could not be prevented by continuous prophylactic administration of iron, but it seems that Hb regeneration was accomplished quicker and to a higher degree because of this medication.

Finsen (1894), Isachsen (1911), and Odin (1937) have demonstrated a seasonal fluctuation of Hb with a minimum in the winter (December-January) and a maximum in the summer (June-August). The rise in Hb is regarded as being due to the influence of ultra-violet rays on the formation of Hb (Odin) as well as to the diet. The seasonal variations were found to be greater in North Sweden (Luleå) than in the south (Lund), attributed to the long winter nights in the north. Grimsgaard (1910), in northern Norway, showed

a decrease in Hb during the dark winter months. Contrary to this, Høygaard (1937, 1940) found the average winter values (December-April) of primitive-living Eskimos in Greenland to be higher than the summer values (June-July), although these were taken when summer food conditions were extraordinarily good. The winter values (men) were 4.5% above those of the summer. In accordance with this, Gyllencruz (1884), of the Swedish Spitzbergen Expedition, 1882-3, found no decrease of Hb during winter (September-February); and Ekelöf (1904) of the Swedish Antarctic Expedition, 1901-4, found an increase of Hb during the second winter. MacLean (1919), of Mawson's Antarctic Expedition, 1911-14, showed a rise in Hb during midwinter and reported that several Arctic expeditions had found no diminution in Hb during the dark months. Howe, in Alaska (Mikkelsen, 1910), and Koettlitz (Scott, 1905), of Scott's Expedition, 1901-4, had reported similar observations.

My investigations show the same increase in winter values, with a marked drop on the arrival of spring, in spite of the increased influence of exceptionally strong ultra-violet light. The diet can be regarded as unchanged, but with additional fresh seal meat and liver in the spring. Thus it seems that the seasonal decrease in Hb during winter found by Scandinavian workers has no correspondence in polar regions. On the contrary, winter values are high, with a marked decrease towards summer.

Adrenaline in Blood

It has been stated by many that the blood adrenaline increases in the polar climate. The raised blood-sugar level should indicate this. Frazier noted an increased liability to adrenaline shock following injections of local anaesthetics with small amounts of adrenaline. He claims this to be due to an increased amount of adrenaline in the blood stream. Butson (1949) investigated this possibility by injecting 1 ml. of 1/150,000 adrenaline intravenously over a period of 90 seconds. A slight increase in sensitivity was noted.

To investigate this further, attempts were made to determine the blood adrenaline by fluorescence according to Pekkarinen's (1948) absorption method. Less than 0.5 mg. of adrenaline per 100 ml. cannot be demonstrated in blood with this method. Tests were done during several periods of our stay: when arriving in Antarctic climate; after mid-

winter, when blood sugar was at its peak; and just before leaving. No measurable amount of adrenaline in the blood could be shown.

Blood Sugar

Fasting blood sugar in the morning was determined according to the Crecelius-Seifert method. As a result of acclimatization the fasting blood-sugar level was increased on an average 9% compared with home values, with incidental peaks averaging 17% increase. This confirms the usual assumption that fasting blood sugar is increased in Antarctic climate.

Frazier (1945) reports that Lockhart, of the U.S. Antarctic Service, 1939-41, found a blood-sugar increase above normal in 13% of the group tested. Butson (1949), of the Falkland Islands Dependencies Survey, found an average increase of 10 mg. per 100 ml. in fasting blood sugar in his subjects (Hagedorn-Jensen method). Heinbecker (1928), by means of the Shaffer-Hartmann method, found the average fasting blood sugar of Eskimos to be 120 mg. per 100 ml. Rabinowitch and Smith (1936) found 137 mg. per 100 ml. by means of the picric-acid method, which is considered to give values 10 to 15% higher than the Shaffer-Hartmann method. They therefore came to the conclusion that Eskimos have a higher fasting blood-sugar level than people living elsewhere. This was not confirmed by Høygaard (1937, 1940), who found an average fasting blood sugar of 88 mg. per 100 ml. (Hagedorn-Jensen) in Greenland Eskimos.

The most interesting result of my blood-sugar investigations, however, is the demonstration of a characteristic curve during adaptation to a different climate. The peculiar feature of this curve is the first great dip in the blood-sugar level (see Chart—compare with the morning white-cell curve). This dip seems to be characteristic for acclimatization. An obvious tendency towards a similar dip is found in the last part of the curve during reacclimatization to temperate conditions. This second dip is well developed in the morning white-cell curve, but would probably have shown equally well in the blood-sugar curve had not tests been discontinued on arriving home, as blood-sugar changes seem to lag one to two months behind white-cell changes. Later tests at home showed that blood-sugar values have returned to normal—the same as before leaving for the Antarctic—thus marking the completion of the second "dip of acclimatization." To illustrate this the assumed continuation of the blood-sugar curve has been drawn (dotted line in Chart).

White-cell Count

The counts were made according to Ellerman's method. Blood was taken while fasting, in the morning, as well as later in the afternoon. The morning white-cell curve shows the same characteristic "dip of acclimatization" as the blood-sugar curve (see Chart). In the first part of Frazier's white-cell curve the corresponding "dip of acclimatization" can be seen. He attributes this to the isolation of the group and the absence of infections and colds. However, the rest of his curve showed a marked difference from mine, because his values were not fasting morning values, but were made from blood taken two hours after meals, and therefore were influenced by activity and prevailing weather. Temperatures at the American base were also quite different from those at ours. A similar but less accentuated "dip of acclimatization" can also be seen in the white-cell counts done by MacLean (1919), of Mawson's Antarctic Expedition.

After acclimatization, morning white-cell values stayed at an even level 25% below normal with only slight variations. There were no pronounced tendencies towards seasonal changes. Ekelöf (1904) found a marked decrease in the number of white cells during a stay in the Antarctic. Isachsen (1911) showed that no seasonal fluctuations are normally found in white-cell counts.

After our return from the Antarctic the values were still 25% below normal (after the reacclimatization dip), prob-

ably owing to the long period with absence of infections. These low values may explain the wide susceptibility to all kinds of infection which most members showed for a long time after coming home. It is curious that the values have remained low also after the men had had a series of infections.

Afternoon white-cell values followed the same trend as the morning values, but were obviously more influenced by the incidental fluctuations of climate and activity at the time of the tests. Thus the morning values were more stable and showed the general trend, while afternoon values were more sensitive indicators of temporary conditions. In fact, if afternoon values are divided by morning values and the

curve is smoothed by applying the formula $\frac{a + 2b + c}{4}$ the curve (after acclimatization) almost accurately, but with a slight drag, follows the inverted temperature curve, and thus reflects the influence of weather (temperature) and the correspondingly varying strain (activity). After we returned from the Antarctic the afternoon values did not remain at the correspondingly low level, as the morning values did, but increased somewhat.

By making a two-way breakdown of the white-cell values, the reliability of the method used with such a small number of subjects can be demonstrated. An arbitrary but convenient division is into smokers (8) and non-smokers (7). This breakdown is interesting, because the smokers seem to represent the high white-cell values, while non-smokers have constantly low values. The morning white-cell curve for smokers (high values), as well as the curve for non-smokers (low values), follows the "normal mean curve" (total values) amazingly well, which goes to show that even with only half the number of test subjects a characteristic and applicable curve could have been obtained. The same applies to the afternoon values. Another interesting fact is that at home the mean morning values for smokers and non-smokers were about the same. When landing in the Antarctic both groups still differed very little, but from then on there was an appreciable difference. The white cells of the smokers seemed to react considerably more to acclimatization and showed a more accentuated "curve of acclimatization." Perhaps smoking makes white-cell values less stable and more liable to react to other stimuli, as the uneven swinging individual curves of the "great smokers" tend to show.

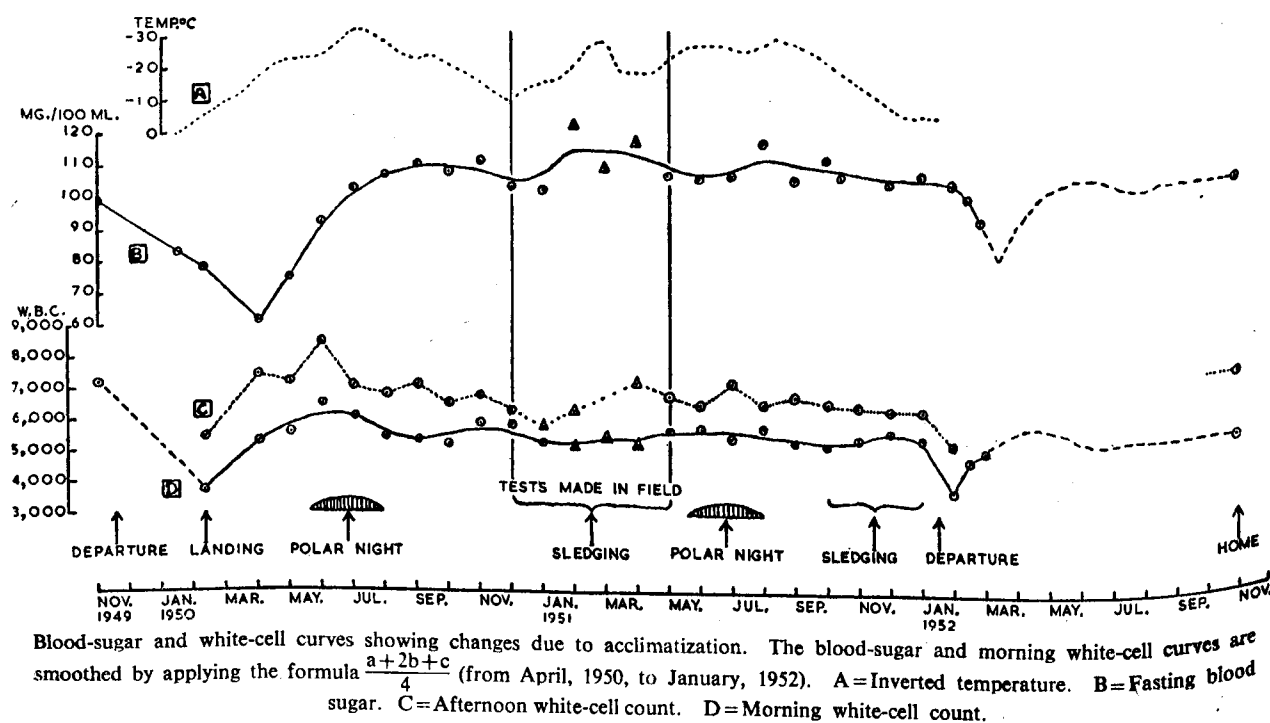
Differential Count.—Blood smears were mostly taken each time white-cell counts were made. The results of these differential counts have not yet been worked out, but there is reason to believe that the counts will show a decrease in eosinophil cells. Stein *et al.* (1949) report that the eosinophil count is significantly depressed on exposure to cold. This was not confirmed by Sapin-Jaloustre, of the French Adelle Land Expedition, 1949-51 (verbal communication, 1945).

Other Tests

Additional blood tests (mainly blood-sugar levels and white-cell counts) were taken on individual members each time they had been away from base any number of days, and therefore had been more exposed to the cold. During the first half-year these tests almost invariably showed a temporary increase in the blood-sugar levels and white-cell counts. In exposing fasting men to cold in a refrigerator Swift (1932) determined the blood sugar just before and immediately after exposure. The blood-sugar level remained unchanged. When exposing cold-adapted men to low temperatures for brief periods of time, Miller and Miller (1948) could not find any significant variation in blood-sugar levels and white-cell counts.

The basal metabolic rates taken in conjunction with the blood tests have not yet been worked out.

I should like to add that after two and a half years of almost continuous blood-letting under trying conditions my comrades are worth all the appreciation that can be given to them.



Summary

Continuous monthly blood tests were made on 15 (14) members of the N.-B.-S. Expedition to the Antarctic, 1949-52, during the two-year stay and the trip there and back.

Red-cell counts showed no changes or seasonal fluctuations. Haemoglobin values showed a typical seasonal fluctuation as a function of outdoor activity, not related to the usual summer maximum and winter minimum shown in Scandinavia. No measurable increase of adrenaline in the blood was found. During acclimatization to Antarctic climate and back again to normal climate fasting blood-sugar values as well as morning white-cell counts showed a characteristic dip of acclimatization in their curves. After acclimatization the fasting blood sugar showed an increased level of 9%, while morning white-cell counts stayed 25% below normal. Morning white-cell values were more stable and showed the general trend of acclimatization, while afternoon values were more sensitive indicators of temporary conditions. The white cells of smokers seemed to be more sensitive to reactions in the Antarctic and stayed at a considerably higher level.

I would welcome any criticism or helpful information about the problems mentioned here.

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Reports of Societies

PSYCHOTHERAPY IN PRISONS

At a meeting of the Section of Psychiatry of the Royal Society of Medicine on December 8, with Dr. E. B. Strauss, president of the Section, in the chair, the subject of discussion was "Psychotherapy in Prisons and Corrective Institutions."

Group Treatment

Dr. J. C. MACKWOOD, for many years psychotherapist to H.M. Prison, Wormwood Scrubs, said that in 1946 a ward for psychotherapy was set apart in the prison hospital grounds. Here the selected prisoners were given the status of sick persons. The ward enabled group treatment to be undertaken, it constituted a kind of family setting, and it sheltered the prisoner from the additional punishments which he might be liable to incur when housed amongst those not getting this treatment. This social group was a potent stimulus for starting respect for the majority verdict. All kinds of offenders responded to this approach and became readjusted, including those with associated psychopathological (functional) disturbances that required analytical psychotherapy which could be provided within this group framework. When the offenders were first seen in prison it was not always easy to determine the cases which

would not respond to treatment, and the acceptance or rejection of a particular individual by the group was often a very useful guide.

Several ex-prisoners had written of the struggle within themselves they had encountered after discharge; a well-organized psychiatric social service for helping the prisoners after leaving prison was essential. In the final analysis this was more a sociological problem than an individual one.

Dr. W. F. ROPER, principal medical officer, Wakefield Prison, said that institutional life was often considered a barrier to successful psychotherapy, but it could be made of assistance. For many years there had been a movement towards enlightened man-management, the object being to liberalize the regime to the greatest extent possible. This was predominantly a lay achievement, but it had provided a background against which useful psychological work had been done. In 1947 a psychiatric unit was set up at Wakefield. At the moment there were two full-time visiting psychiatrists, a psychologist, and a psychiatric social worker. Prisoners were subject to a periodical review by the whole-time medical officers, and, when considered desirable, were referred to the psychotherapist for treatment. The prisoner was given an opportunity to work out new and more successful attitudes in his personal relationships.

The difficulties attending psychotherapy in prison were those of selection and timing, those associated with after-care, with relatives and the domestic environment, with occupation, and with the attitude of the group. Aftercare was a great problem, not made easier by the fact that in many cases the prisoner wanted, after his discharge, to have no reminder of his prison experience. The psychiatric social worker could do something to mitigate the difficulties following discharge. Relatives might be a great help or a great hindrance. They could help if they remained loyal or reverted to loyalty, and a great hindrance if they fostered ideas of innocence and injustice. Group treatment had worked very well in the hands of medical officers. It was no hardship to work with and through the existing prison staff, who were good colleagues, but the psychiatrist must "fit in." The results of psychological treatment at Wakefield were difficult to assess, but not unpromising.

Approved Schools

Dr. CHRISTOPHER LACK, visiting psychiatrist to the Magdalen Hospital Classifying School, introduced the subject of psychotherapy in approved schools. Girls, committed by a juvenile court in the southern half of England and who were between the ages of 14 and 17 years, were admitted to the classifying school for observation and investigation, before being sent on to the training school best suited to their needs. In selecting girls for psychotherapy, it was important to bear in mind not only their need for treatment but whether they were capable of adjusting to the life of a small community in an open school. A few approved-school girls were so violent as to disrupt the community in which they lived. Special provision was needed for the management and treatment of the aggressive, unstable adolescent, some of whom were psychopaths.

A greater number of girls would be amenable to training and to psychotherapy if they were committed earlier. The approved school should not be used as a last resort. Many of the girls had a history of disturbed behaviour and emotional difficulties dating back over several years, and the problem was intensified if they were not committed until the approach of their 17th birthday. Only a small percentage of girls were recommended for psychotherapy. The latter was only one weapon in the war against juvenile delinquency. Nowhere in the field of psychiatric endeavour was it more necessary to be modest in their claims than when they intruded upon the domains of the Law.

Discussion

Dr. PETER SCOTT, physician at the Maudsley Hospital, spoke of the value of the visiting psychiatrist who was able to link the prison with the mental health service. He mentioned the similarities between offenders referred

Correspondence

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

Treatment of Tetanus

SIR,—The short paper by Dr. J. H. McIntyre on the treatment of tetanus (*Journal*, October 17, p. 866) raises a number of points of considerable practical importance. There can be no disagreement with the advice offered by the author that where tetanus is unusually prevalent in a community, as it appears to be in New Zealand, and as it certainly is in this Western state of Australia, antitetanus immunization should be carried out at the time of immunization against diphtheria. Bigler and Werner,¹ Miller and Ryan,² and North and Patterson³ have demonstrated that highly protective titres of tetanus and diphtheria antitoxin develop after simultaneous inoculation with the two toxoids.

Dr. McIntyre's gloomy views on treatment—"present methods of treatment of tetanus in cases occurring within a week of injury are ineffective"—cannot, however, be accepted without qualification. Recent literature on this subject has stressed the use of this or that relaxant, and a tendency to place reliance on these pharmacological agents as the only life-saving measure worthy of consideration has unfortunately arisen. It would appear that we are in danger of losing perspective on this therapeutic problem. The immediate cause of death in tetanus is often an academic question not easy to answer; certainly exhaustion and anoxia caused by a prolonged apnoea due to severe spasms may be incriminated in many cases. In the inhibition of these spasms relaxants most assuredly must be regarded as a significant advance in therapy, obviating the use of heavy doses of centrally depressing soporifics. But a constant finding at necropsy is also the presence of excessive quantities of mucus in the bronchial tree with associated collapse and infection of one or other lobes of the lungs. In a recent paper my colleagues and I⁴ have adduced evidence that lives may be reclaimed if attention is paid to the prevention of the pulmonary complications of severe tetanus. When, by virtue of a short incubation period and the early onset of symptoms, a stormy course can be predicted, early and timely tracheotomy is to be recommended. Two cases, one a boy of 17 with an incubation period of only 3½ days, and the other an elderly lady who presented with signs of complicating pneumonia, were quoted in support of this contention. They were both treated in the conventional manner with, in addition, tracheotomy: both patients survived.

The problem in tetanus is to support life over the weeks when the toxin is exerting its pharmacological effect on the synapses of the central nervous system. Inhibition of synaptic excitation may be achieved with one or other relaxant; large doses of penicillin and antitoxin are useful in attacking the living micro-organism and neutralizing unfixed toxin in circulation; intragastric feeding sustains the nutrition of debilitated patients and lessens the risk of tracheal aspiration of food particles. In addition to these measures, concerning which there can be no room for debate, judicious tracheotomy with intratracheal suction and the usual posturing measures can reasonably be expected to prevent, in many cases, pulmonary collapse and sepsis. For some reason physicians are apt to adopt a conservative view towards tracheotomy, an attitude of mind which can no longer be held justifiable.

There can indeed be no place for therapeutic nihilism in an infection which continues to carry, even in this antibiotic age, a high mortality rate among young and healthy people. The statistical assessment of the results of treatment of tetanus is admittedly difficult; in the meanwhile we must be guided by experience in individual cases. In the minds of many of us there is little doubt of the value of tracheotomy.

for treatment in prison and those seen in a clinic for offenders at the Maudsley Hospital. The frequency of long spontaneous remissions indicated special care in assessing results in these cases.

After some further discussion, Dr. ROPER said that one point which he had found effective in group treatment was to challenge a prisoner at the very beginning to bring forward all the grouses he wished. All that they had to say in criticism of the general set-up was then heard. Perhaps three or four different sessions were devoted to this subject, and then they settled down to a fair amount of steady work.

Dr. MACKWOOD, also in reply, said that regression was the great bugbear in delinquency, but regression was a vague term unless one had in mind a fixation point to which the person regressed. One had, of course, to adjust the psychotherapeutic work in prison to the length of the sentence, which to a large extent determined the possibilities. It was important to assess the character structure of the individual as quickly as possible, and then set about canalizing his energy into useful channels.

MEGALOBlastic ANAEMIAS IN EAST AFRICA

At the meeting of the Royal Society of Tropical Medicine and Hygiene, held at Manson House, London, on December 10, Dr. HENRY FOY, of the Wellcome Trust Research Laboratories, read a paper on the influence of the intestinal flora on the synthesis of haemopoietic factors in the megaloblastic anaemias of Africans. He was describing some of the research carried out by Dr. Athena Kondi and himself in Kenya in recent years.

Some of these cases of megaloblastic anaemia responded to penicillin or to vitamin B₁₂ given by mouth, he said; some did not respond to these but responded to intramuscular B₁₂ (and these had histamine-fast achlorhydria and signs of gastric atrophy); some responded only to folic acid. These anaemias were uncommon in the coastal areas of Kenya, but were seen in the highlands. The patients were not undernourished, but there was evidence to suggest that one factor in the aetiology might be a diet containing too much starchy food and too little protein, and that such a diet favoured an intestinal flora inimical to the synthesis and utilization of B₁₂.

The Role of Penicillin

Administration of penicillin probably altered the ecological equilibrium of the gut flora, upsetting the balance between those organisms which synthesize B₁₂ and those which compete for it, and probably caused changes in bacterial metabolism for other bacteria or for the host. Penicillin might also destroy bacteria containing B₁₂, and thus make this substance available for the host. The acceleration of growth in animals following the administration of antibiotics, the prevention of liver damage in animals given necrogenic diets, and the development of megaloblastic anaemia in *Diphyllobothrium* infections were probably all related phenomena associated with changes in the flora and fauna of the alimentary tract and connected with the synthesis, absorption, and utilization of vitamin B₁₂. It was known that biosynthesis in the gut produces a wide range of essential metabolites, including nicotinic acid, riboflavin, folic acid, inositol, and tocopherol, which become available either for the host or for the organisms inhabiting the gut. The megaloblastic anaemias which accompany infection with *D. latum* could always be cured by removal of the worm, which would be found to contain large amounts of B₁₂, clearly obtained at the expense of the host.

In the discussion which followed the paper, Professor A. W. WOODRUFF commented on the fact that some of the cases had responded to intramuscular B₁₂ but failed to do so on oral B₁₂. He suggested that the amounts given might have been insufficient. Only the bound form of B₁₂ was effective. He also discussed the possible effects of bacterial infections high in the intestine. In West Africa macrocytic anaemias were associated with deficiency of protein.

in conjunction with the use of antitoxin, antibiotics, sedatives, relaxants, and intragastric feeding, in saving many cases.—I am, etc.,

Perth, Australia.

ERIC G. SAINT.

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Treatment of Acute Pancreatitis

SIR,—As a result of my experience of 24 cases of acute pancreatitis in the last three years I have formulated opinions which differ in several respects from those expressed by Mr. R. M. Davies, Mr. F. T. Moore, and Mr. D. Wynn-Williams (*Journal*, December 5, p. 1251). Of my 24 cases, 21 were women and only 10 occurred in the fifth and sixth decades, the youngest being aged 22 and the oldest 83. Unlike the authors, who express the view that biliary calculi are an incidental finding in acute pancreatitis, I believe that there is in some way a direct association with gall-stones, as I have seen two cases occurring after cholecystectomy and drainage of the common bile duct, one in the immediate post-operative period, where the duct had contained purulent bile, and the other six months after operation. I have also operated for unsuspected acute pancreatitis on a young woman of 27—an age at which gall-stones are uncommon—and found a gall-bladder which appeared outwardly normal but contained many stones.

I cannot agree with the authors in their statement that exploratory laparotomy is indicated even if there appears to be no doubt about the diagnosis. I am convinced that operation is contraindicated and that, if the abdomen is opened in error, the pancreas should be disturbed as little as possible, and no drainage of the pancreas or gall-bladder should be established. My figures show that, of nine cases which were submitted to operation, four died, and of 15 cases which were treated conservatively, four died. Two of these latter were fulminant cases and died within 14 and 24 hours of the onset of symptoms; the other two followed cholecystectomy and partial gastrectomy respectively and occurred in the immediate post-operative period. The one difficulty which I have encountered in the conservative treatment is the control of pain, and the reported results of the administration of hexamethonium, if they are confirmed in a larger series of cases, represent to me a major advance in the therapy of acute pancreatitis.—I am, etc.,

Liverpool, 1.

W. M. BEATTIE.

SIR,—By their success in treating four proven cases of acute pancreatitis, Dr. Russell M. Davies and his colleagues have made out an appealing case (*Journal*, December 5, p. 1251) for the use of the ganglion-blocking drugs in this distressing, and sometimes fatal, condition. However, while they discuss Marion's rather impractical treatment by repeated splanchnic blockade,¹ they make no mention of the well-tried continuous technique by means of a fine indwelling epidural catheter.² The latter method of inducing analgesia and vasodilatation is at least as effective as the methonium drugs, and in severe cases may provide a more satisfactory measure of pain-relief, without the same degree of vascular hypotension that accompanies complete ganglionic blockade with the methonium salts.

When an epidural catheter is in place analgesia can be controlled according to the needs of the patient by varying the concentrations of injected drugs, without the need to extend the limits of the spinal block above the sixth thoracic segment; in this way a considerable degree of vasomotor stability is retained. With the methonium drugs, on the other hand, if analgesia is insufficient one must increase the dose and thereby inflict a greater degree of vasomotor paralysis upon the patient. Moreover, the ileus that tends to accompany acute pancreatitis may be aggravated by large doses of the methonium drugs.

I gave pentamethonium iodide to the last case of acute pancreatitis that I was called upon to treat, instead of insert-

ing an epidural catheter, but the patient obtained only partial relief of pain in the presence of an alarming fall of blood pressure. It was my intention to change the treatment to a continuous epidural block the next day, as being a more efficient method, and less disturbing to the patient's physiology. But the patient died during the night, and at necropsy the degree of pancreatic destruction and retroperitoneal haemorrhage made it seem unlikely that any treatment could have saved her.

Dr. Davies and his colleagues are to be congratulated upon their results and for recalling attention to the methonium drugs, but it would be unfortunate if their lack of comment on the epidural technique were taken to indicate that the continuous method does not merit consideration.—I am, etc.,

Chichester.

P. R. BROMAGE.

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SIR,—We were very interested to read the important paper on the treatment of acute pancreatitis with hexamethonium bromide by Dr. Russell M. Davies, Mr. F. T. Moore, and Mr. D. Wynn-Williams (*Journal*, December 5, p. 1251). We were particularly intrigued by the apparently detailed literature suggesting the possible aetiology of this condition.

May we point out that in our book, *The Liver*,¹ we put forward a new concept of the aetiology of this disease which agrees with and explains the aetiology put forward in this stimulating paper? In brief, we postulated a thrombophlebitis of the portal radicles draining the pancreas as the cause of gangrenous pancreatitis.

In view of this new communication we feel that in fairness we should direct attention to our publication of 1950.—We are, etc.,

London, W. 1.

DAVID HALER.
KASPER BLOND.

REFERENCE

- ¹ *The Liver*, 1950. John Wright.

Nodular Fibrosis of the Lung

SIR,—With reference to the aetiology of the new syndrome of nodular fibrosis of the lung in coal workers with rheumatoid arthritis (*Journal*, December 5, p. 1231), it is clear that the tuberculous association must be explored, and also whether it is a primary or secondary factor. It would be interesting to know whether any similar condition has been found in miners with sarcoidosis. I would, however, like to put forward another possible explanation. The nodules may be granulomata resulting from a slowed lymph flow and transmission of dust from the periphery of the lung.

Lymph node hyperplasia occurs in 70%¹ of rheumatoid patients, and there is evidence that it is present throughout the body and therefore presumably affects the hilar glands. My own observations are that men are far more frequently and severely affected by this than women. I commented in 1949² on the possible implications of Selye's³ work with "formalin arthritic" rats when he showed that Indian ink injected peripherally was transmitted to the lymph nodes more effectively when the nodes were small and under the influence of A.C.T.H. than when they were normal. Furthermore, in rats treated by L.A.P. (lyophilized anterior pituitary tissue), which caused hyperplasia of the lymph nodes, even less Indian ink appeared to reach them.

A possible line of research would seem to suggest itself here. Expose for a sufficient time three groups of suitable laboratory animals to atmospheres polluted with coal dust and/or stone dust: (1) normals; (2) L.A.P. or deoxycortone acetate treated; (3) A.C.T.H. treated. Meanwhile the effect of A.C.T.H. or cortisone used early might be noted in the disease itself.

Another granuloma (Whipple's disease) occurring in the jejunum and related lymph glands also has a high incidence of polyarthritis at the outset and a vastly predominant male sex incidence. I have suggested⁴ that this lipophag-

granuloma may be related to slowing of the fatty lymph flow, lymph node hyperplasia from stress and rheumatoid arthritis being the possible initiating factor.—I am, etc.,

J. W. PAULLEY.

Isleworth.

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- ⁵ *Lancet*, 1949, **1**, 214.

Routine Lumbar Puncture in Primary Tuberculosis

SIR,—In the reply concerning routine lumbar puncture in primary tuberculosis ("Any Questions?" *Journal*, November 7, p. 1058), the author states that the incidence of tuberculous meningitis is very low in primary tuberculosis. Surely this is only true as a general statement and special mention should have been made of the disease in infancy.

It is well known that tuberculous meningitis and miliary tuberculosis are the two great complications of primary tuberculosis, occurring as they do as part of the accompanying haematogenous dissemination, and that the incidence of these complications is relatively much greater during the first three years of life. I think, therefore, that a tentative case can be made out for routine lumbar puncture in cases of primary tuberculosis in this age group, since the dissemination is likely to be more active, and the early symptoms of meningitis difficult to detect. It is agreed that at any age miliary tuberculosis and primary complex with persistent pyrexia are valid indications for routine lumbar puncture.

It seems very unlikely that rupture of a subcortical tubercle by release of pressure on lumbar puncture could have caused meningitis within five days in the case cited by Dr. Ian G. Wickes (*Journal*, December 5, p. 1271), since the very nature of the pathology of meningitis the condition takes some time to develop. It seems far more likely that the findings of Bernard et al.,¹ quoted in the reply, are correct, and that, if meningitis develops shortly after a lumbar puncture, it does so because the process was already active though preclinical, and the lumbar puncture purely coincidental.—I am, etc.,

Hexham.

PHILIP M. WARD.

REFERENCE

- ¹ Bernard, E., et al. (1949). *Sem. Hôp. Paris*, **25**, 2053.

Appeal for Specimens

SIR,—May I make use of your columns to appeal for specimens of kidney from cases of acute nephritis? This condition so rarely reaches the post-mortem room nowadays that it is extremely difficult to collect material. The work upon which I am engaged involves the elution of antibodies from the kidney, so that it is essential that the specimens are not fixed in the ordinary way, but preserved in a deep freeze or refrigerator. If any specimens are encountered and the pathologist or clinician concerned contacts me (preferably by telegram or telephone—Edinburgh 41001, extension 30), I shall arrange to have them collected or sent here.—I am, etc.,

B. CRUICKSHANK.

Pathology Department,
University New Buildings,
Teviot Place, Edinburgh, 1.

Amoeboma of the Caecum

SIR,—In reply to Dr. L. Everard Napier's criticism of my memorandum (*Journal*, December 5, p. 1269), may I point out that in my original account all the information he seeks was present? At your editorial request I cut down the article to two-thirds of its original length, and had not the privilege of Dr. Napier's expert advice in this pruning operation.

I gave the following information: (1) The patient had never been out of this country except during the war, when he was on military service abroad. (2) No history of diarrhoea was given before operation, but on specific questioning afterwards he admitted that he had diarrhoea on and off while in the Middle East. (3) The antibiotics used before operation were penicillin and streptomycin; aureomycin and

chloramphenicol were not available for general use in 1949, when the operations were performed. (4) The tumour was not removed until the affected part of bowel had been exteriorized for three days. By that time the mass was partly gangrenous and the pathologist was unwilling to give a firm opinion. I can only say that at operation the mass appeared to be inflammatory rather than neoplastic, but admit that the evidence is incomplete. (5) As regards "personal criticism," surely that is of secondary importance. Here we had a case simulating appendix abscess and found at operation to be a caecal mass. In a country where amoebiasis is not endemic the diagnosis at operation lay between neoplasm, Crohn's disease, or tuberculosis. Had I performed entero-anastomosis or a formal resection, or even taken a biopsy, the patient would almost certainly have died of peritonitis. The two-stage operation proved to be the only safe one and was done on general principles. I wrote to help my fellow surgeons and hence the details of "surgical interference." (6) In my original account I suggested a therapeutic test with emetine, but would add that the toxic effects of this drug should be appreciated.

I also have some good photomicrographs for Dr. Napier's perusal if he would like to see them.—I am, etc.,

Epsom.

E. N. CALLUM.

Insulin Zinc Suspensions

SIR,—I was interested in the observation by Dr. G. M. Wauchope (*Journal*, December 12, p. 1325) that when she transferred her patients from globin insulin to insulin zinc suspension "lente" she found it necessary to increase the dose in order to maintain a similar control as with the globin insulin.

A series of 15 patients, who were treated as in-patients in this hospital, were carefully stabilized on a minimum dose of protamine zinc insulin. After satisfactory control had been present for seven days, these cases were then given the same daily dose of lente insulin. Within two or three days it was found that the dose of insulin had to be increased in every case except one, the increase ranging from 6 to 22 units. All the cases in this series were mild diabetics requiring from 28 to 66 units of lente insulin. Of three patients suffering from allergic insulin reactions, two continued to have them with insulin zinc suspension.

I wish to thank Evans Medical Supplies, Ltd., for supplies of insulin zinc suspension used in this trial.—I am, etc.,

Llwynypia, Rhondda.

M. S. PATHY.

Unwrapping the "Journal"

SIR,—The letter from Dr. H. Lyndhurst Duke (*Journal*, December 12, p. 1326) was very interesting, and seems to justify the mention of a swift and safe method of extracting the *Journal* from its wrappings which I have used for some months and can recommend for serious attention. The little finger of the left hand is inserted through the open end of the wrapper into the central space in the rolled up *Journal*. The right hand grasps the wrapper gently but firmly. By rotating the little finger in such a way as to "wind up" the rolled *Journal* like a watch spring it can be felt to grip the little finger firmly and at the same time to relax its outward pressure on the wrapper, from which it can be withdrawn like a cork from a bottle. It is sometimes necessary to insert the little finger into the other end and try again. I have become so used to this manoeuvre that I use it for the *Lancet*, which still has the quick-tearing strip in its wrapper.

It is possible to reverse this process and replace the *Journal* in the wrapper unknown to the owner.—I am, etc.,

Accrington.

J. H. ARMSTRONG.

SIR,—Dr. H. L. Duke (*Journal*, December 12, 1953, p. 1326) may be interested in my method of extraction of the *Journal* from its wrapper. This method is simple, speedy, and tidy. Grasping firmly the *Journal* and its wrapper in the middle third with the left hand, insert the index and middle fingers of the right hand into the proximal orifice as

SIR,—Both the excellent article by Professor T. N. A. Jeffcoate (*Journal*, October 31, p. 951) and the letter from Mr. J. A. Chalmers (*Journal*, November 21, p. 1159) show the dangers that general anaesthesia carries for both mother and baby when used for instrumental delivery. It is true, as Mr. Chalmers points out, that local analgesia is unsuitable for the more difficult forceps deliveries, but there are other forms of conduction analgesia which avoid the risks of general anaesthesia. It may seem bold to advocate spinal analgesia for these cases, and perhaps to reopen a perennial argument, so soon after the appearance of a report on a medico-legal case involving sequelae from it in two patients. Your columns, however, from time to time report the complications of all kinds of anaesthetic methods. The position is well summed up by Professor R. R. Macintosh in his monograph on *Lumbar Puncture and Spinal Analgesia*.¹ This deals thoroughly with the technique of spinal analgesia while avoiding discussion of its advantages and disadvantages, and in the introduction the author states: "I do not intend to extol the virtues of spinal analgesia. The benefits of any method of pain relief, general or local, have to be paid for in terms of morbidity, and the price exacted of the patient in this respect depends little on the choice of method or agent but very much on the care, skill and experience of the anaesthetist himself." Another authority, Dr. Frankis Evans,²

has stated: "The method is quite safe if used properly, in the right circumstances and with proper precautions."

Much of the prejudice against spinal analgesia in obstetrics dates from the days when more toxic drugs were in use and its risks were not appreciated. Previous correspondence in these columns about its risks for caesarean section has shown the widespread fear of its use for that operation. The level of analgesia required for a forceps delivery, however, does not involve the risks of fall of blood pressure and respiratory disturbance which may occur with the higher analgesia required for caesarean section. The risks of infection and nerve damage should be avoidable by proper technique. The only troublesome complication is that of headache, which should occur rarely if a fine needle is used. The use of cinchocaine ("nupercaine") gives ample time for an unhurried delivery and repair. The recent report by Mr. Henry Roberts¹ on over 3,000 obstetrical cases in which saddle spinal analgesia was used in Walton Hospital, Liverpool, shows the great safety of the method.

It is unfortunate that this subject arouses such strong feelings when it is discussed, and it was well said by Dr. Langton Hewer² in his review of Professor Macintosh's book: "It is curious that a moderately scientific body of men, such as surgeons and anaesthetists would claim to be, seem unable to reason calmly and dispassionately on the subject of spinal analgesia." It may be that the development of sacral and lumbar epidural block will give us the advantages of spinal analgesia without its risks, but the chances with this method of an overwhelming spinal analgesia will always have to be weighed against the small risks of a deliberate low subarachnoid block.

The introduction of lignocaine ("xylocaine") has been a big advance in local analgesia and for the pudendal block sufficient for low-forceps deliveries. For the more difficult cases, however, in view of the evidence about the results of other forms of conduction analgesia I feel that it is the use of general anaesthesia which now has to be justified, especially with the present tendency to displace the supreme safety of open ether with other methods.—I am, etc.,

Middlesbrough.

BRYAN WILLIAMS.

REFERENCES

- ¹ *Lumbar Puncture and Spinal Analgesia*, 1951. Edinburgh.
- ² *Modern Practice in Anaesthesia*, 1949, p. 252. London.
- ³ *J. Obstet. Gynaec. Brit. Emp.*, 1953, 60, 269.
- ⁴ *British Medical Journal*, 1951, 2, 31.

Appendix in Hernial Sac

SIR,—Mr. Henry B. Young, reporting a case in which the appendix was strangulated in a femoral hernia (*Journal*, November 28, p. 1216), states that appendectomy was difficult as the caecum "could just be drawn into the [femoral] canal and no more." The implication is that he tackles his strangulated femoral hernias by the "low" approach.

Surely there can be little justification to-day for such an approach, when an extra 10 minutes on the duration of the operation is unlikely to be harmful. In particular the operative procedure described by McEvedy¹ has much to recommend itself. By McEvedy's approach the femoral canal is under direct vision, the hernial sac can be amputated as high as possible, and the strangulated contents of the sac can be handled with ease and safety.—I am, etc.,

Liverpool, 15.

RAYMOND HELSRY.

REFERENCE

- ¹ *Ann. roy. Coll. Surg. Engl.*, 1950, 7, 484.

Greater London Fund for the Blind

SIR,—On December 4 a pianoforte recital was given at the Festival Hall by Mr. Walter Gieseke on behalf of the Greater London Fund for the Blind, and a special appeal was made to colleagues in London. The hall was sold out, resulting in a sum of over £1,500, of which contributions from our profession amounted to over £500.

I hope you will kindly allow space to thank all those who responded so very generously to my appeal and who helped to achieve this magnificent result.—I am, etc.,

London, W.1.

B. W. RYCROFT.

Obituary

R. V. PAYNE, M.Chir., F.R.C.S.

With the death of Mr. R. V. Payne on December 10 at the early age of 45 the Windsor area has lost a brilliant and distinguished surgeon when at the height of his career.

Richard Vaughan Payne was born on July 16, 1908, and was educated at St. John's College, Cambridge, and at Guy's Hospital, qualifying in 1932. He graduated M.B., B.Chir. in 1934, took the F.R.C.S. in 1935, and proceeded to the M.Chir. in 1936. From Guy's, where he had held a number of house posts and the appointment of demonstrator in anatomy and physiology in the medical school, he went to Windsor in 1936, when he was elected to the staff of King Edward VII Hospital as assistant surgeon. Three years later he became full surgeon. He was happy to give all his time to the area in which he had settled, and within the first few years of his arrival in the district was elected as surgeon to the smaller hospitals at Maidenhead, Staines, Iver, Egham, and Windlesham. He served with the Royal Air Force in 1946-7, and during the course of his duties went to India and became adviser in surgery at Air Headquarters in that country, attaining the rank of wing-commander. With the introduction of the National Health Service he was elected as surgeon to the Canadian Red Cross Memorial Hospital at Taplow when that hospital was taken over by the State. About a year ago his right arm had to be amputated, but he continued to act in a consultant capacity to the hospitals with which he was associated. He leaves a widow and three children.

We are indebted to Mr. J. GAYMER JONES for the following appreciation: Vaughan Payne was a firm believer that a happy, personal relationship should exist between patient and consultant both in hospital life and in private practice, and did his best to embody the soul of the old voluntary system in the modern health service. He gave willingly of his time to the various committees connected with the Windsor group of hospitals, and was chairman of the King Edward VII Hospital medical committee. He was also president of the Windsor and District Medical Society during its jubilee year, 1949-50, and was elected a Fellow of the Association of Surgeons of Great Britain and Ireland. Vaughan Payne was a keen sportsman and was much admired for his skill with both the gun and rod. He was a lover of nature and, as might be expected, was fond of his garden. His courage during his last illness, and, indeed, also that of his wife, was remarkable. This young surgeon had to face many operations, including the removal of his right arm for a condition that he well knew would probably prove fatal, and he did this with a calm courage and happy demeanour that was nothing short of amazing. He was always willing to be interested, although in pain, in accounts of things that were going on in the area he loved, and it was never difficult for his friends to go in and talk to him, even about himself and of the things that were to happen. The sympathy of all will go out to his widow and three children.

S. D. MITCHELL, M.B., D.P.M.

Dr. S. D. Mitchell, consultant psychiatrist at Cane Hill Mental Hospital, Coulsdon, died suddenly in the grounds of the hospital on December 8.

A native of Birmingham, Sydney David Mitchell (formerly Isaacs) was born on July 10, 1902, and was educated at Clifton College and at Emmanuel College

Cambridge. He received his clinical training in the Birmingham Medical School and qualified in 1928, graduating M.B., B.Chir. in the following year. After holding a number of house appointments at Birmingham he worked for a time in general practice, but was soon attracted to psychiatry. After taking the D.P.M. in 1931 he became medical officer at Long Grove Hospital, Epsom. Later, after a period of training at the then London Child Guidance Clinic, he was appointed medical director of the Creighton House Clinic in Fulham. His interests at this time extended to psychosomatic medicine, and in 1936 he took part in research on the psychological aspects of rheumatism. During the last war he directed an E.M.S. neurosis clinic at Shotley Bridge General Hospital in County Durham. With this varied experience behind him, he accepted an appointment at Warringham Park Hospital. The comprehensive psychiatric services provided there gave him ample scope, and he took a very full part in the physical and social therapy for which the hospital is pre-eminent.

Mitchell's lifelong love of music led him to investigate its use in psychiatry, and he published a number of papers and became a recognized authority on the subject. His observations record the reactions shown by patients suffering from different forms of mental disorder to music of different periods and schools; these reactions he found of value in diagnosis, and also as a basis for discussion and elucidating interpersonal relations in group sessions. More directly he fostered the use of music as a source of delight and interest, sometimes using it as a means of resocializing patients to whom no other form of occupation or recreation made any appeal. This was seen especially in the patients' percussion bands, which he founded and conducted personally. When he was appointed consultant psychiatrist to Cane Hill in 1950 he brought his ideas and methods with him, so that the two hospitals soon became keen rivals in musical activity. Latterly he had extended his researches to the subject of combined music and art therapy.

Mitchell was a fine all-round psychiatrist with a mature and balanced judgment, therapeutic enterprise and sympathy, tolerance, and good humour—qualities which endeared him to patients and staff alike. His untimely and tragic death at the age of 51 deprives his hospital of a most loyal and trusted colleague and psychiatry has lost the further contributions which would certainly have come from him. He leaves a widow—Norah Gruhn, the operatic singer—and two children, to whom we offer our sympathy.—A. W.

Dr. PHILIP ELLMAN writes: I first met Sydney Mitchell over 30 years ago when he was a Cambridge undergraduate, and the qualities of loyalty, sincerity, and complete integrity for which so many friends, patients, and colleagues have since known him were already then apparent. There were three facets to his life and character—medicine, music, and his home—and the quality of his life was enriched, even created, by the integration of the three. As a young doctor, after several resident appointments in Birmingham, including the posts of house-physician to Professors P. C. P. Cloake and J. G. Emanuel, circumstances led him to general practice, where he was immensely beloved and respected, perhaps mainly because of his own insight into and sympathy with the psychological side of his work. More and more he was drawn to his beloved psychiatry, and with the outbreak of the war his real ambition was fulfilled when he became a psychiatrist with the Emergency Medical Service.

Initially music had been a hobby more than anything else, but with his marriage to Norah Gruhn, the well-known soprano, it became part of his complete life. Dr. Mitchell was a pioneer in the use of music as a form of therapy for mental patients, being a founder member of the Council for Music in Hospitals. Not only did he draw satisfaction from the good results achieved, but his active mind was constantly seeking new methods and new paths to explore. To conduct his hospital orchestra gave him intense satisfaction, and it is a happy thought that he was engaged in this less serious side to his work only a few hours before his death. Moreover, this aspect of psychiatry commingled most readily with his home life, and in it he was wholeheartedly encouraged and assisted by his devoted wife. Her wisdom and professional knowledge stood him in very good stead, and she herself was always ready to sing at concerts for mental patients. Music in medicine formed, indeed, a bridge between home and hospital.

All his friends will recall the fundamental peace and cheerfulness of the Mitchell home, and I recall the same warm hospitality of his parents' home before his marriage. At home his friends were able to penetrate the reserve that cloaked an intensely human, lovable, and understanding personality and to know him as a wise and sympathetic husband and father. There his wide interests and many-sided cultural pursuits were fully evident, and it is for these reasons above all that his untimely death leaves a void in so many hearts.

Dr. G. C. HARTLEY, who died at his home at Sutton Coldfield on November 6 at the age of 66, will be remembered as an unusually conscientious, kindly, and proficient general practitioner in the Erdington and Sutton Coldfield districts for some 27 years. In addition to conducting a general practice he was chairman of a National Service medical board in Birmingham, a part-time referee for the Ministry of Health, an examining medical officer to the Ministry of Pensions, and at one time medical officer at the Jaffray Hospital, Birmingham. Born at Montrose, Forfarshire, on January 11, 1887, the son of a Methodist minister, George Cleverdon Hartley had the advantages of a good education and the knowledge that for him success in life could come only as the result of hard work. After leaving Kingswood School, Bath, he was apprenticed to an engineering firm in Leeds, but a few years later he decided that medicine was to be his vocation and entered Birmingham University, where his fiancée, Miss Muriel Evans, was already a medical student. He graduated M.B., Ch.B. in 1916, and then, after holding the appointment of house-surgeon at Queen's Hospital, Birmingham, served in France during the first world war as a captain in the R.A.M.C. In 1917 he was awarded the Military Cross for "saving life under fire." Subsequently he saw service at Salonika and Constantinople for two years. On his return to civilian life he took the London Conjoint diplomas in 1920. Two of his three daughters also took up medicine as a career, both qualifying at Birmingham University, as their father and mother had done before them.—P. T.

Dr. A. S. WALKER died at Middlesbrough on November 29 at the age of 75 after a long illness. Arthur Samuel Walker was born at Middlesbrough on June 9, 1878, the younger son of Dr. Samuel Walker, and was educated at Uppingham and King's College, Cambridge, whence he went on to Edinburgh University to read medicine. He graduated M.B., Ch.B. in 1906, and proceeded to the M.D. in 1914. After holding the appointments of house-surgeon at Leith Hospital and at the Royal Maternity Hospital, Edinburgh, he became interested in preventive medicine, and took the D.P.H. in 1910, when he was appointed medical officer to the Leith education authority. On the outbreak of war in 1914 he was mobilized as a Territorial officer in the R.A.M.C., and served at home and in Italy until the end of the war, when he returned to Leith. Just over 30 years

ago he joined his brother in the family practice at Middlesbrough, and he also became police surgeon and medical officer to the Post Office. His keen interest in his fellow men led him to take an active part in freemasonry and in the Rotary movement. He was a man of great personal charm, and his warm-hearted humanity endeared him to a wide circle of friends. As a doctor he was interested in his patients as persons rather than as cases, and by them he will be sadly missed. Dr. Walker was unmarried and is survived by his brother, Mr. Harold Walker, F.R.C.S., and three sisters.—J. I.

Dr. W. J. ASHBY, who was for many years a well-known general practitioner in the Aylesbury district of Buckinghamshire, died at the Mercy Home, Cork, on December 1 at the age of 68. Born at Sandhurst on November 6, 1885, William Joseph Ashby was brought up in Ireland and was educated at Queen's (now University) College, Cork. He won distinction as a mathematician, and was selected for training as a teacher, but he chose medicine instead and graduated M.B., B.Ch., with honours, from the National University of Ireland in 1910, proceeding to the M.D. three years later. He was a sprinter of note and a good Rugby player, playing forward for Munster and for Ireland, and he was a member of the British Isles team which toured South Africa. After graduation he held house appointments at the Derbyshire Royal Infirmary and the Norfolk and Norwich Hospital before entering general practice at Aylesbury. During the first world war he served in the R.A.M.C. in France, during the battles on the Somme, and in Egypt and Palestine. Returning to his general practice in Aylesbury, he was appointed surgeon-in-ordinary to the Royal Buckinghamshire Hospital, and was also elected to the county council. His simple humanity, kindness, and good-natured humour and wit made him friends in every stratum of Buckinghamshire society, and these qualities, added to undoubted skill and knowledge, resulted in a thriving practice. Patients and friends alike found him a tower of strength at times when they most needed help, and he did not spare himself during sickness or sorrow. His later years were spent in Cardiff, where he continued to practise until his retirement early this year. Warning oedema had given him an inkling that the days to come were limited, and he returned to Ireland, salmon-fishing contentedly at Donnemare. It was characteristic of his spirit that after sustaining a Pott's fracture early this season he was back at the river with rod and sodden plaster within four days. His final illness was a short one, and he had a joke for everyone until the day before he died.

The premature death of Mr. J. W. F. RICHARDSON on December 14 at the age of 37 came as a severe blow to his many friends. James Walker Freer Richardson was born at Simla on September 12, 1916, the younger son of the late Dr. James Freer Richardson, and received his medical training at St. Thomas's Hospital. He qualified M.R.C.S., L.R.C.P. in 1941, and then held appointments at St. Thomas's and other hospitals before entering the R.A.M.C. in 1942 for service in the last war. On his return to civilian life he obtained the F.R.C.S. and then went into general practice. A colleague writes: Jim Richardson's death comes as a shock, particularly to all St. Thomas's men who were students at the beginning of the last war. He was one of the fittest men among us, and he played rugby with considerable zest. He served with distinction as a medical officer attached to the Royal Marine Commandos in the Far East theatre of war, being mentioned in dispatches, and on his return home he obtained the diploma of F.R.C.S. After his tenure as senior resident medical officer at Queen Charlotte's Hospital, Hammersmith, he went into general practice for a while, and just as he was settling into his future work he was called to higher service. He enjoyed life to the full, and he was a wholly delightful companion. He made friends wherever he went, and he will be sadly missed.

Medical Notes in Parliament

CARE OF THE AGED SICK

Mr. DAVID LLEWELLYN initiated a debate on December 14 on the provision for care and treatment of the aged sick. On the question where the fault lay, he said that any suggestion that the upper strata of the administration were less acutely aware of the problem than they should be was quite wrong. It was argued that now the poor law infirmaries were merged into the general hospital system comparisons with pre-Health Service days were no longer valid. But against this there was an impressive volume of demand from general practitioners for an extension of statutory powers. His questions to the Minister were: Was he content that the statutory powers are wide enough? What substance was there in the charge that general practitioners are exaggerating the gravity of cases, understating the ages of patients, and even resorting to dialling 999 to get an elderly patient into hospital? And was the Minister satisfied that his memorandum of November 2, 1951 (to the effect that those simply in need of care and attention should not be refused admission to hospital while other accommodation was sought), was being fully observed?

Mr. IAIN MACLEOD gave first the statistical background to a problem which he described as perhaps the most baffling in the whole Health Service. He agreed with Lord Amulree, and other members of the executive of the Medical Society for the Care of the Elderly, that the appointment of relieving officers was not the solution. If such an officer was under the local authority, would it be possible for him to direct that a hospital board should make a bed available? If he was a layman, it was difficult to see how he could decide between medical priorities; and, if not, it was not easy to see how that could be an improvement on the present position. They might delude themselves by too easy a comparison with the position before 1948, when local authorities had institutions. In many areas now there was simply no bed to which such a person could be allocated, and there was an immense problem of priorities in deciding between a person of the aged and chronic sick class and a younger person needing urgent treatment. The suggestion had been made that prefabricated institutions should be built, where simple care would be provided. Those who suggested that recognized the danger of a lower standard of medical care. Short-term solutions might remain longer than was intended, and it would be the final irony of the Welfare State if all they could find to solve this immensely difficult problem was to bring back the relieving officer and rebuild, in whatever form, the workhouses. That was not the road.

He thought the solution lay rather in the home than in the hospital. Progress must be seen as a whole—the additional hospital beds, the increased rate of turnover (to which he attached the greatest importance), the extension of out-patient services, increased provision of residential homes, development of welfare and voluntary services, the development of the geriatric service. While they should by all means ask whether the State had failed, they should also ask whether the family, the neighbours, the local authorities, the voluntary bodies, and the churches were doing all they could. It was a problem for all.

Fall in Prescription Costs

Mr. GILBERT LONGDEN asked the Minister of Health on December 17 whether he could give any information about the results of the steps he had taken to encourage doctors to reduce the cost of their prescribing in order to release funds for improvements elsewhere in the National Health Service. Mr. IAIN MACLEOD: While the average cost of prescription has hitherto increased progressively every year

Universities and Colleges

UNIVERSITY OF BIRMINGHAM

Dr. H. F. Humphreys has been appointed a governor of the University College of North Staffordshire for three years.

Enid Charles, Ph.D., Reader in Demography and Vital Statistics in the University, has accepted an invitation from the World Health Organization to advise the University of Malaya on the setting up of a department of demography and medical statistics, and has been granted leave of absence for one year from August 1, 1953.

Dr. W. T. Cooke, Reader and First Assistant in Medicine, has been granted leave of absence for the first quarter of 1954 to visit gastro-intestinal and metabolic clinics in the U.S.A.

The Rockefeller Foundation has made a grant of £28,800 to Professor J. J. Elkes for research in psychiatry and in the biochemistry and pharmacology of the nervous system. The grant will cover the five-year period beginning in July, 1953, and will be spent mainly on salaries, technical assistance, and supplies.

Professor A. B. MacGregor has been appointed Director of Dental Studies and Professor J. Osborne Deputy Director and Tutor.

Dr. David Mendel resigned the appointment of National Coal Board Fellow in the Department of Medicine on May 31, 1953.

The title of University Research Fellow has been conferred upon Dr. G. Holt, research worker in the Medical Research Council's unit for research on the experimental pathology of the skin, during the tenure of his present post.

Dr. K. Valteris, Research Fellow in Pathology, has been seconded to the service of the Regional Hospital Board for work in the Department of Pathology at Dudley Road Hospital.

UNIVERSITY OF LEEDS

At a meeting of the Council of the University on October 21 it was agreed to confer the title of Emeritus Professor on Professor R. D. Passey on his retirement from the Chair of Experimental Pathology.

Dr. Andrew Bogdan has been appointed Senior Registrar and Tutor in Paediatrics for one year in the first instance from November 1, 1953, and Dr. I. S. Bruce Lecturer in the Department of Anaesthetics from November 15, 1953.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College held on October 29, with the President, Sir Russell Brain, in the chair, Dr. T. Jenner Hoskin, Dr. B. E. Schlesinger, Dr. A. M. Cooke, and Dr. J. C. Hoyle were elected Councillors of the College; Dr. J. Forest Smith was elected representative on the Committee of Management; Sir Russell Brain, Sir Harold Boldero, Dr. W. G. Barnard, Sir Allen Daley, and Dr. A. M. Cooke were re-elected members of the Standing Joint Committee of the three Royal Colleges; Dr. C. E. Newman was appointed representative on the Examination and Tuition Advisory Board of the Association of Medical Records Officers; and Professor A. A. Moncrieff was appointed representative at the Annual Conference on Maternity and Child Welfare for 1954.

The Registrar announced that Dr. J. A. Smiley had been appointed Milroy Lecturer for 1955, and that his subject would be "Personal Factors in Accident Proneness."

The following candidates, having satisfied the Censors' Board, were elected Members of the College: Y. K. W. Aboul-Dahab, M.B., Mary H. Aitken, M.B., Mary Bateman, M.D., D. B. Benazon, M.B., R. A. Bruce, B.M., W. Brumfit, M.B., J. P. Caley, M.B., Rosemary A. Cooper, M.B., R. F. A. Dean, L.R.C.P., A. E. Dormer, M.B., C. P. V. Evans, M.B., J. H. Evans, M.B., H. Foster, M.B., Major, R.A.M.C., L. Friedlander, M.B., J. F. Hale, B.M., D. R. Hay, M.B., F. E. Higgins, M.B., A. W. Johnston, M.B., E. N. M. Johnston, M.B., Lilian F. Jones, M.B., H. P. Lambert, M.B., G. Larkins, M.B., J. C. Leonard, M.D., A. Z. Abd-El Massieh, M.B., B. F. Robinson, M.B., A. Sachs, M.D., Brigadier, R.A.M.C., A. W. Steinbeck, M.B., L. V. Sthyr, M.D., J. D. Stride, L.R.C.P., Surgeon Lieutenant-Commander, R.N., J. H. Tyrer, M.D., B. W. Webb, M.D.

Licences to practise were conferred upon the following 106 candidates (including 20 women) who had passed the final examination in Medicine, Surgery, and Midwifery of the Conjoint Board and who have complied with the by-laws of the College: J. Anderson, M. E. Anfilogoff, Christine M. Armstrong, B. S. Beardsworth, P. J. Bell, J. A. Bevan, C. Bishop, R. J. Blow, C. W. W. Brown, L. F. Brunt, J. D. Campling, Patricia M. Carpenter, J. A. A. S. Chamberlain-Webber, H. J. Clarke, A. Clark-Jones, W. E. Clifford-Jones, J. T. Coals, R. J. C. Cobbold,

since the National Health Service started, I am glad to say that in August the estimated cost fell to about 1½d. less than in August 1952. This was maintained in September and there was a further reduction to 2d. in October. I am glad to have this opportunity to thank the joint committee on prescribing for their valuable work in classifying preparations, and the General Medical Services Committee of the British Medical Association and the whole body of general practitioners for their co-operation in producing this encouraging result.

Mr. LONGDEN asked whether this satisfactory result followed on the advice given to general practitioners about prescribing drugs of doubtful therapeutic value. Mr. MACLEOD said it seemed almost certain that the two were linked, because the letter was sent out by the Chief Medical Officer on July 18 and the first noticeable drop was in the month following. Asked by Dr. EDITH SUMMERSKILL whether he would consider giving instructions to doctors not to prescribe certain drugs if there was an equivalent in the National Formulary, Mr. MACLEOD thought this would be too big an interference with the ordinary discretion of doctors.

Mr. RICHARD ADAMS asked how far limitations were placed on prescriptions under the National Health Service in cases of tuberculosis, and in particular on the prescription of cod-liver oil and malt. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, said that a general practitioner might prescribe any generally available drug or medicine which he considered necessary for the treatment of tuberculosis. Cod-liver oil and malt might be prescribed when it could properly be regarded as a drug for the treatment of a patient.

Health in West Africa

Mr. RONALD RUSSELL asked the Secretary of State for the Colonies on December 16 what improvement had been made in the health of the people of the West African Colonies, Protectorates, and Trusteeship Territories in recent years.

Mr. OLIVER LYTTLETON informed him that there had been a general improvement in the health of the peoples of these territories. For example, the use of new drugs in certain areas had drastically reduced the incidence of leprosy. In Nigeria mobile teams had been set up to deal speedily with outbreaks of epidemic diseases, and a large pilot scheme was in being to combat yaws. Trypanosomiasis had ceased to be a public health problem in the Gold Coast. In the Northern region of Nigeria a considerable area had also been cleared of the tsetse fly.

Artificial Limb Repairs

Mr. IAIN MACLEOD, answering questions by Mr. JAMES SIMMONS on December 17, stated that the average time taken for repairs to artificial arms during January-July, 1953, was 50 days, and during August-November, 1953, 70 days. Similarly, the average time for repairs to artificial legs had been 30 days and 35 days. Mr. SIMMONS said it was apparent that since the Ministry of Pensions had ceased to have responsibility for these repairs there had been a longer time lag, and asked the Minister to see that Roehampton was not penalized by the change in administration. Mr. MACLEOD said that he would certainly do his best, but it was quite unworthy to suggest that a firm which was providing artificial limbs for ex-Service men was going to alter its skill and time of delivery purely because there had been a departmental change. Mr. SIMMONS said that he made no imputation against the firm, but against the change in administration.

Major LEGGE-BOURKE asked if the Minister could give an absolute assurance that the fact that the two Ministries had merged had no relevance whatever to the increased time involved in repairs.

Mr. MACLEOD: None at all.

C. W. M. Cooper, Violet G. Cousins, Shirley A. Crockatt, J. Crook, I. D. Davies, W. C. Davies, Jose A. Day, J. D. Devitt, Eva M. Dilling, M. S. G. Douglas, D. R. Elam, J. I. Evans, P. Field, C. V. Foll, Gillian France, P. J. Frost, T. Gibson, L. Goldie, Rosemary A. Grange, A. N. Green, J. M. Green, F. V. Griffiths, S. T. Gunewardene, Dorothy J. Harden, Margaret M. Heley, E. J. Hill, H. Holden, W. J. Jackson, Elsie Jaques, I. R. Jenkins, J. J. Jones, Elizabeth M. H. Kennett, P. Konfortion, G. E. T. Lawley, I. V. Lishman, D. Longbourne, K. Loucas, T. M. McAneny, J. G. Macdonald, M. A. McDonald, G. F. Mackenzie, T. D. M. McNeill, Patricia S. Matthew, Bridget d'E. Matthews, C. Mawdsley, Jean E. Moffat, Margaret L. M. Monro, R. J. Morgan, F. J. Morley, C. E. Nelson, M. R. Oates, R. C. Oliva, Patricia M. O'Sullivan, R. B. Pardoe, D. J. Parry, D. M. Paul, J. D. W. Peck, J. W. Prout, J. E. G. Rault, A. D. Richardson, J. A. V. Riley, A. A. Roe, W. A. St. John, S. C. C. Scott, D. E. Sharland, Jean M. Shields, A. J. Slim, Marguerite L. Sloper, P. C. Smart, C. J. Stephens, R. L. G. Sutcliffe, G. W. Sykes, M. Tack, A. Talalla, R. W. H. Tavenner, E. M. Thomas, C. P. D. Tong, E. A. M. Tuck, H. M. Turner, J. C. S. Turner, F. B. Valentine-Hagart, H. W. C. Ward, Isabel M. P. Ward, W. H. Waters, J. H. H. Webster, P. H. Wiesendanger, Lee Yoke Hyam, G. W. G. Yule.

Diplomas were granted, jointly with the Royal College of Surgeons of England, as follows:

DIPLOMA IN CHILD HEALTH.—Elizabeth A. Martin, K. R. Mombert, and to the other successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

DIPLOMA IN MEDICAL RADIO-DIAGNOSIS.—K. M. C. de Silva, H. K. T. Fernando, P. G. Keates, L. Langton, Kee Loo Lim, E. A. H. MacLaughlin, O. D. Macnamara, W. B. D. Maile, A. C. Mitra, B. O'Hare, A. W. Robinson, A. Roy, H. Tayebbhoy, J. A. Watson.

DIPLOMA IN MEDICAL RADIOTHERAPY.—D. M. T. Cones, G. McK. Crawford, D. A. L. Dick, Marjorie O. Dunster, G. B. Goodman, B. T. Hale, F. E. Neal, J. D. Reeves, M. Samiullah, J. G. Stewart, Elsie N. K. Wallace.

DIPLOMA IN OPHTHALMOLOGY.—J. M. Ferries, R. Smith. Diplomas were also granted, jointly with the Royal College of Surgeons of England, in Tropical Medicine and Hygiene, in Anaesthetics, in Industrial Health, and in Laryngology and Otolaryngology, to the successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on October 8, with Sir Cecil Wakeley, President, in the chair, Sir James Learmonth was appointed the Sir Arthur Sims Commonwealth Traveling Professor for 1954, and it was reported that Sir Cecil Wakeley had been appointed the Hunterian Orator for 1955.

The Sir Gilbert Blane Naval Medal was presented to Surgeon Captain J. G. Holmes.

Dr. E. Rohan Williams (St. Mary's) was admitted as the co-opted Member of Council representing radiology.

The ophthalmological research unit, which has been in existence for ten years under Professor Arnold Sorsby, was admitted to the status of a department of the College.

Dr. R. Wyburn-Mason was awarded a Proffit Research Studentship; the Handcock Prize was presented to Mr. J. J. Jones (King's College Hospital); and Mr. G. Hass (London Hospital Medical College) was admitted as a Macloghlin Scholar.

The Council approved the institution of a Mitchiner Medal, in memory of the late Major-General P. H. Mitchiner, to be awarded annually for outstanding services to military medicine by an officer of the Army Medical Services or the R.A.M.C. A similar medal, presented by Sir Stanford Cade for award to a medical officer of the Royal Air Force, was instituted in memory of the late Lady Cade.

The Council agreed, on the recommendation of the trustees of the Hunterian Collection, to publish *The Life of William Clift*, by Miss J. Dobson, Recorder of the College.

The Council received a number of interesting gifts, including a portrait of Sir Henry Newland presented by the Royal Australasian College of Surgeons; a portrait of the late Sir Robert Jones and various relics of Hugh Owen Thomas presented by Mrs. Hilda Watson; and part of the manuscript of Wilfred Trotter's *Instincts of the Herd in Peace and War* presented by Mr. H. Morrison Davies.

Diplomas of Membership of the College were granted to F. J. Morley (St. Thomas's) and S. C. C. Scott (Guy's).

Diplomas were granted, jointly with the Royal College of Physicians of London, to the following successful candidates:

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—A. Ahmad,

Fatima S. Ahmed, J. A. S. Amos, R. P. Bradshaw, T. M. W. D'Arcy, M. W. Dhurandhar, J. M. Dube, J. R. Eley, J. I. T. Glover, G. H. V. Keshani, H. D. Madsen, T. C. H. Mathews, R. Mortimer, G. A. Real, S. Rehman, A. D. Ross, J. G. Slater, S. G. Talpade, Margrit Zuber, S. Rao, Majuree Sundaravej.

DIPLOMA IN CHILD HEALTH.—C. A. L. Abrams, A. Ahmad, R. N. Akeel, A. Allibone, Kooki N. Bharucha, H. C. H. Bird, Irene F. A. Blakeney, M. Braudo, N. Broughton, Dorothy F. M. Burnett, Joan M. Cashman, Margaret J. Cox, Marian E. Cox, Diana F. J. Duncan, C. N. Faith, Eva O. Faulkner, Carol A. Foxell, Margaret J. Francis, Jessie S. Freeman, A. K. Ghosh, J. C. Gillespie, Bandana Gupta, D. T. G. Harris, W. B. McN. Howie, Jasmine R. Jacob, B. Jaffe, F. E. James, K. V. Jones, Winifred A. Kane, A. J. Keay, P. J. E. Lewis, Joo Lee Lim, Daphne H. Line, A. D. Macdonald, K. W. Matheson, Joan M. Mawer, Margaret B. Mearns, J. L. Miller, B. J. L. Moss, J. W. Muller, C. W. A. Murray, Gwendoline D. Newman, M. N. Orton, V. Pillai, Dafne E. MacG. Plowman, Theresa Posner, O. C. Raffel, Myrtle J. Raynor, Ellen L. M. Rhodes, Nancy M. B. Robertshaw, Hilary G. Rubin, D. Satya Nand, M. K. Sawday, D. H. Shennan, Priyani E. Soyva, Sara I. Stinson, T. E. Stockley, Elsie G. Taylor, Katharine J. Thicknesse, A. J. Thomas, Elizabeth S. Tomlinson, Pamela S. Triplett, Joan E. Walton, Sheila M. Watts, J. Wessels, Enid M. Whitfield, T. K. Williams, Irene H. Winick.

DIPLOMA IN ANAESTHETICS.—J. C. Richardson.

DIPLOMA IN INDUSTRIAL HEALTH.—K. B. Roy.

DIPLOMA IN LARYNGOLOGY AND OTOLARYNGOLOGY.—J. B. Blacklay.

DIPLOMA IN OPHTHALMOLOGY.—R. Smith.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council held on September 26, with the President, Mr. Arthur A. Gemmell, in the chair, the following awards were made: *Leverhulme Research Scholarships for 1954*, I. Donald, J. Gardiner, M. L. Paterson. *William Blair-Bell Memorial Lectureships for 1954*, T. E. C. Barns, I. Donald.

Vital Statistics

Infectious Diseases

Only quite small variations occurred in the number of notifications of infectious diseases for the week ending December 5 in England and Wales; the largest were increases of 65 for scarlet fever, from 1,484 to 1,549, 57 for acute pneumonia, from 557 to 614, and 46 for dysentery, from 399 to 445.

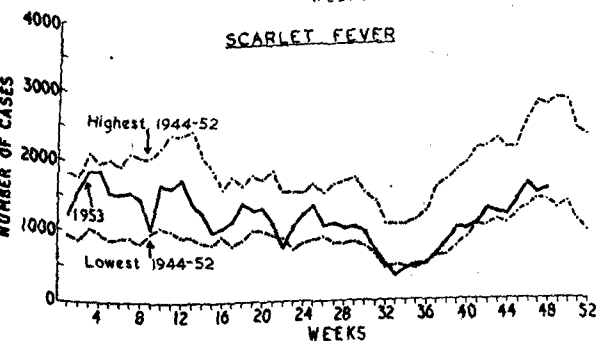
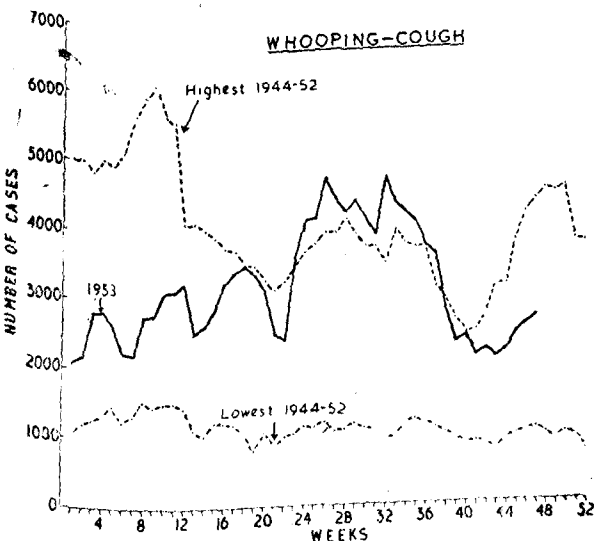
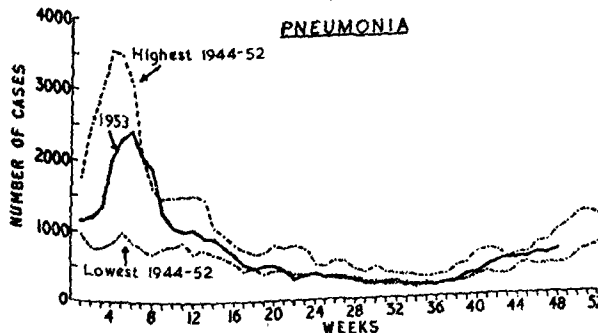
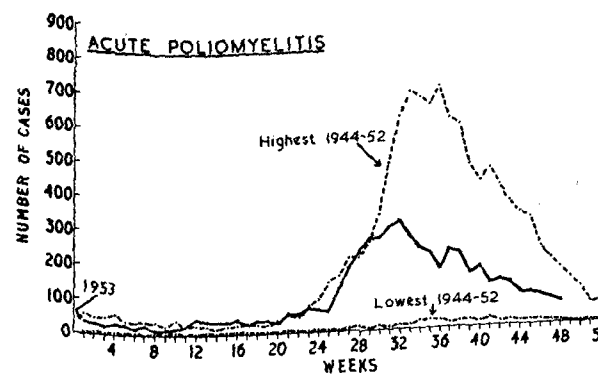
The largest increases in the incidence of scarlet fever were 38 in Essex, from 81 to 119, and 30 in Yorkshire West Riding, from 175 to 205. 2,595 cases of whooping-cough were notified, being 13 fewer than in the preceding week. The usual fluctuations in the local trends were recorded, the largest being decreases of 54 in Yorkshire West Riding, from 239 to 185, 53 in Essex, from 186 to 133, and 40 in Durham, from 97 to 57, and increases of 41 in Warwickshire, from 138 to 179, and 40 in Lancashire, from 227 to 267. The number of notifications of measles increased from 875 to 886. The largest variation in the returns was a decrease of 40 in Lancashire, from 168 to 128. 13 cases of diphtheria were notified, being 3 fewer than in the previous week. These cases were reported from 5 administrative areas—Warwickshire, Birmingham C.B. 5; Staffordshire, Coseley U.D. 3, Sedgley U.D. 2; Lancashire, Liverpool C.B. 2; Devonshire, Plymouth C.B. 1.

The notifications of acute poliomyelitis numbered 65 and were 1 fewer for paralytic and 11 fewer for non-paralytic cases than in the preceding week. The largest returns were Lancashire 8, Devonshire 6 (Totnes R.D. 3), Staffordshire 6 (Cannock U.D. 3), Gloucestershire 5 (Bristol C.B. 5), London 4, Yorkshire West Riding 4.

The largest centres of dysentery were Yorkshire West Riding 74 (Shipley U.D. 23, Bradford C.B. 21, Leeds C.B. 13), London 57 (Hackney 12), Lancashire 56 (Bolton C.B. 32), Leicestershire 45 (Leicester C.B. 37), Norfolk 34 (Norwich C.B. 32), Middlesex 25, Essex 23 (Barking M.B. 10).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 5 (No. 48) and corresponding week 1952.

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

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

CASES in Countries and London	1953					1952				
	Eng. & Wales	Land	Scot.	N. Ire.	Eire	Eng. & Wales	Land	Scot.	N. Ire.	Eire
Diphtheria ..	13	0	10	1		20	2	3	1	
Dysentery ..	445	57	129	7	1	197	17	66	7	
Encephalitis, acute ..	2	0	0	0		5	0	0	0	
Enteric fever: Typhoid ..	3	0	0	0		1	0	0	1	1
Paratyphoid ..	1	0	1	0		4	1	0	0	0
Food-poisoning ..	205	40		5		58	9		0	
Infective enteritis or diarrhoea under 2 years ..				10	16				12	13
Measles* ..	886	12	22	17	84	14,791	1560	190	34	93
Meningococcal infection ..	27	7	13	1	1	29	3	10	3	4
Ophthalmia neonatorum ..	31	3	3	0		21	3	4	0	
Pneumonia† ..	614	50	173	30	4	619	46	328	5	1
Poliomyelitis, acute: Paralytic ..	49	2		6	2	56	4		5	0
Non-paralytic ..	16	2			8	21	4			3
Puerperal fever§ ..	250	39	18	0		244	45	7	0	1
Scarlet fever ..	1,549	77	323	44	60	2,399	169	358	43	86
Tuberculosis: Respiratory ..			126	35				162	28	
Non-respiratory ..			18	3				30	10	
Whooping-cough ..	2,595	131	390	74	120	2,138	148	115	33	81

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Land	Scot.	N. Ire.	Eire	Eng. & Wales	Land	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..	0			0		0			0	
Enteric fever ..	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years ..	9	0	3	1	1	5	0	2		3
Influenza ..	12	2	1	0	0	18	7	1	0	1
Measles ..	0	0	0	0		0			0	0
Meningococcal infection ..	0	0				1				
Pneumonia ..	220	29	19	8	3	220	28		13	5
Poliomyelitis, acute ..	5	0			0	4	0			0
Scarlet fever ..	0	0	0	0		0			0	0
Tuberculosis: Respiratory ..	88	6	14	3	7	127	19	13	2	5
Non-respiratory ..	3	3	4	1	0	4	2	1		3
Whooping-cough ..	3	0	0	0	0	4	1		0	0
Deaths 0-1 year ..	226	25	24	10	10	240	31	30	9	18
Deaths (excluding stillbirths) ..	5,071	715	523	111	166	6,042	853	618	130	176
LIVE BIRTHS ..	7,105	1049	832	184	365	7,125	1063	829	210	298
STILLBIRTHS ..	202	26	27			179	18	23		

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

† Includes primary and influenza pneumonia.

§ Includes puerperal pyrexia.

Medical News

Westminster Abbey.—The national banks have agreed to assist in the transfer of the odd shillings and pence remaining in their clients' accounts at midnight, December 31—the last day of Coronation Year—to the Westminster Abbey Appeal Fund. The Abbey is appealing for a million pounds for desperately needed repairs and restoration. So far just over £700,000 has been collected. All that a donor needs to do is to sign a form, available at his bank, authorizing the transfer. Although the most that an individual can give in this way is 19s. 11d., the last time such a collection was made on a national scale—for the King George V Memorial Fund—£100,000 was obtained. Christmas is a time for giving, and it is certain that doctors will not be backward in responding to this appeal.

Professor R. Bastianelli, 90.—It gives us great pleasure to congratulate Professor Raffaele Bastianelli on reaching his 90th birthday. The doyen of Italian surgeons, he is an honorary fellow of the Royal College of Surgeons of London and a foreign corresponding member of the British Medical Association. He was born on December 26, 1863,



and from the day he entered the medical faculty of Rome University he has remained at work in that city right up to the present time. For 25 years he was professor of clinical surgery in Rome, and to-day he is still active and still operates. He has been a general surgeon all his professional life, though his special interests have been in brain and abdominal surgery. During the first world war he directed a front-line surgical unit treating wounds of the head, abdomen, and chest. One of the earliest qualified pilots in Italy, he flew his own aeroplane for many years, only giving up about 10 years ago when his plane was destroyed during the war. Leading the life of a surgeon, a farmer (quite recently he conducted an extensive investigation into the literature of chestnut tree disease), and an art connoisseur, Professor Bastianelli still exerts a powerful influence in his own country. His many friends in other countries will be glad to hear that old age has proved such a minor hindrance to one who was always noted for his intellect, open-mindedness, courage, and humanity.

Medical Research in the Colonies.—One section of the Colonial Office publication *Colonial Research, 1952-3* (Cmd. 8971, 7s. 6d. net), is devoted to the work of the Colonial Medical Research Committee, the body which advises the Colonial Secretary and the Medical Research Council on all matters of medical research in and for the Colonies. Since 1940 £12m. has been allotted (£6½m. spent) to Colonial development and research schemes of one sort or another. Medical research has had 14% of the total allotted, but in addition a further 28% has been provided for research on trypanosomiasis and insecticides and rather more for agricultural schemes, all of which play an important though indirect part in promoting the health and well-being of the Colonial peoples. Malaria, filariasis, loiasis, guinea-worm infestation, yellow fever, and leprosy are some of the principal diseases being studied, often in several colonies simultaneously. There is also work proceeding on hot climate physiology and metabolic problems. The latter type of investigation is often carried out by visiting workers from Britain, a development which the committee is keen to foster. New research grants during the year reviewed have included £106,000 for the Medical Research Council's field research station at Fajara, in the Gambia, £90,000 for

insecticide research in East Africa, and £77,000 for the Colonial Microbiological Institute at Trinidad.

A Novel Out-patient Department.—The Earl of Onslow, deputizing for the Minister of Health, opened the new out-patient department at St. James's Hospital, Baltham, on December 11. The building is constructed of brick piers supporting specially toughened glass, the floors being tiled with cork. The unusual feature is that the plastic partitions between the various clinics are all movable so that the number, size, and shape of the clinics can be altered at will. To facilitate this each internal pier contains within it steam, water, and gas services, to allow equipment to be sited almost anywhere required. A similar provision has been made for electricity supplies, telephones, and clocks. There are three floors, with a waiting space on each, and as well there is a large hotel-like lounge for the convenience of friends accompanying patients and those who arrive too early for their appointments. Outside is a lawn on which stands the statue by Wayne Hobson which has aroused so much local controversy. The department has cost £178,000 and is designed to deal with 200,000 patients a year.

Local Medical Societies.—Recent meetings have included the following: *Ulster Paediatric Society.*—On October 30 Mr. James Robertson showed the society his film "A Two-year-old Goes to Hospital." *Manchester Medical Society.*—In an address to the Section of Medicine on November 4 on "Inquiries into the Cerebral Basis of Temperament and Personality" Dr. Denis Williams described current work on the functions of the "silent areas" of the brain. This had been made possible by advances in neurosurgical and electronic techniques. Clinical disease and electrical stimulation of the silent areas produced complex disorders of thought, feeling, behaviour, and memory, so that now it was becoming possible to establish a physiological basis for some processes previously explicable by psychology alone. *Liverpool Medical Institution.*—On November 26 there was a discussion on emergencies in newborn infants. Dr. F. P. Hudson, who opened the discussion, stressed that infections in the newborn besides spreading rapidly were often caused by organisms not responsive to penicillin. He advocated as a routine a combination of penicillin and streptomycin, with chloramphenicol later if these failed. He also described the emergency treatment of haemorrhage, jaundice, and respiratory obstruction in the newborn. Mr. P. P. Rickham followed with an address mainly concerned with congenital malformations and their diagnosis. *West Midlands Physicians Association.*—At a meeting in Birmingham on November 28 Professor A. P. Thomson was elected president in succession to Dr. J. H. Sheldon.

Langley Memorial Prize.—This prize, valued at about £17, is open to competition among officers of the Colonial Medical Service who are serving, or who have served, in West Africa. The prize will be awarded for the best paper on one of the following subjects, special consideration being given to original work: tropical medicine or surgery; tropical hygiene and sanitation; or tropical entomology and parasitology. Papers, which may consist of either published or unpublished work, should be sent to the Dean, London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1, not later than October 1, 1954.

Research in Eire.—The Medical Research Council of Ireland has recently issued its annual report for 1952. It received £19,600 during the year from the Hospitals Trust Fund, by arrangement with the Minister for Health, and grants amounting to £1,500 from Messrs. Arthur Guinness, Son and Co., Ltd. The Council's most important activity is research on the chemotherapy of tuberculosis. A new project which is receiving support is a survey of the incidence of congenital abnormalities in children born in Dublin.

British Association of Plastic Surgeons.—The annual general meeting of the association took place at the Royal College of Surgeons, Lincoln's Inn Fields, on December 11, when the following officers were elected for 1954: *president*, Mr. D. N. Matthews (London); *hon. treasurer*, Mr. R. P.

Any Questions?

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

Spread of Crab Lice

Q.—Is it possible for crab lice to be acquired other than by sexual intercourse? If so, what are the commonest ways in which this may happen?

A.—The crab louse is a sedentary ectoparasite and does not survive easily away from the human body. Since it commonly infests the pubic region, there is little doubt that sexual intercourse provides its simplest means of spreading from one person to another; indeed, it is sometimes known in France as *papillon d'amour*. On the other hand, it is clear that there are other means of transmission. Thus, infants may become infested from their mothers, usually on the scalp, which is their only hairy region. In older children and adults infestation of the scalp is rare, but the eyebrows or eyelashes may be invaded in the absence of pubic infestation. There is a tendency for *Phthirus* to spread through small groups of men living very closely together—for example, among crews of small merchant ships or soldiers in camp.

While these facts prove that there are modes of dissemination other than sexual contact, there is very little evidence as to which are the most frequent. There are stories of crab lice being found on the seats of public water closets and in beds; and it is very likely that they or their eggs may be spread on loose hairs dropped by infested persons, particularly if towels or blankets are shared. The larval and mature lice die within a day or so of removal from the body. On analogy with *Pediculus*, the eggs would probably survive about a week, but would not hatch unless warmed to body temperature.

A Developing Moustache in a Young Girl

Q.—A girl aged 9 years began to develop a moustache a year ago, and it is increasing slowly. She appears healthy otherwise, and there is no hirsuties elsewhere. What is the likely cause, and should she be investigated further?

A.—The development of a moustache indicates an androgenic stimulus above normal, and the adrenal itself is most likely to be the source of the stimulus. In this connexion it should be remembered that the adrenarche, as distinct from the menarche, normally occurs over a number of years and may precede the menarche by some years. In fact the adrenarche bears the same relationship to the menarche as the climacteric to the menopause. The biological basis of the adrenarche is the augmentation (via the pituitary) of adrenal cortex function involving both androgens and glucocorticoids, either predominating according to the genetic endocrine constitution of the individual.

As in all endocrine processes, the physiological may become the pathological and the borderline be indistinct. In the case described we are probably dealing with a hyperplasia rather than a neoplasia of the adrenals, but the latter should be borne in mind as a possibility; there is also the possibility of an ovarian neoplasm, but I would regard this as unlikely.

Investigations should consist in urinary assays of the 17-ketosteroids and the 11-oxysteroids and, depending upon these results and the clinical evaluation of the condition, such further investigations as intravenous pyelogram, carbohydrate tolerance, blood count, etc. The family history may indicate a similar genetic tendency in other members, and also the probability of the type of evolution.

Osborne (Liverpool); *hon. secretary*, Mr. J. P. Reidy (London); and *Council*, Mr. W. Hynes (Sheffield), Mr. Rainsford Mowlem (London), Mr. P. H. Jayes (East Grinstead), Mr. Mortimer Shaw (Leeds), Mr. J. N. Barron (Salisbury), Mr. J. S. Tough (Glasgow), Professor T. P. Kilner (Oxford), Mr. A. B. Wallace (Edinburgh) (*Editor*), and Mr. B. K. Rank (Melbourne).

Scientific Exhibition, Glasgow, 1954.—Those wishing to exhibit are reminded that the last day for receiving entries is December 31. Details and application forms are obtainable from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Honorary Degrees at Leeds.—In congregation on May 14, 1954, the honorary degree of LL.D. will be conferred on Professor Evarts A. Graham, professor of surgery in Washington University, St. Louis; Professor F. W. Rankin, President of the American College of Surgeons; and Sir Cecil Wakeley, President of the Royal College of Surgeons of England. The ceremony will take place during the period of the meeting at Leeds of the Associations of British and American Surgeons.

Dr. Pierre Lépine, director of the department of virology at the Institut Pasteur, Paris, and internationally renowned for his research on viruses, has been elected to the French Academy of Medicine.

Professor T. J. Mackie, Irvine Professor of Bacteriology, has been elected dean of the faculty of medicine at Edinburgh in succession to Sir Sydney Smith.

COMING EVENTS

Institute of Dermatology.—The fourth in the series of semi-permanent exhibitions will be available from January 1 to 23, 1954. It is given by Dr. H. Haber on "Cytological Diagnosis."

International Organization Against Trachoma.—The next meeting will be held at Montreal on September 11, 1954. Further information may be obtained from the secretary-general, 45, Lincoln's Inn Fields, London, W.C.2.

SOCIETIES AND LECTURES

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

Tuesday, December 29
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Cutaneous Syphilis.

Wednesday, December 30
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Specific and Foreign Body Granulomas.
ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Operations and their Indications (1).

Thursday, December 31
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Subcutaneous Mycotic Infections.
ROYAL EYE HOSPITAL.—5.30 p.m., Miss M. Savory: Differential Diagnosis of Diplopia.

Friday, January 1
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. D. Porter: Disorders of the Skin Affecting the Hair Follicles.

Saturday, January 2
MIDLAND TUBERCULOSIS SOCIETY.—At Birmingham Chest Clinic, series of short communications.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Carstairs.—On December 9, 1953, at the Churchill Hospital, Oxford, to Jean, wife of Captain J. R. L. Carstairs, R.A.M.C., a daughter—Alison Frances Elizabeth.
McGrigor.—On November 27, 1953, to June (formerly Casswell), wife of Ronald Buchanan McGrigor, M.B.E., F.R.C.S., of 34, Prince Albert Road, London, N.W., a son—Alastair.
Warren.—On December 12, 1953, to Josephine Barnes, D.M., F.R.C.S., F.R.C.O.G., M.R.C.P., wife of Dr. Brian Warren, 46, Chester Square, London, S.W., a son.

DEATHS

Courtenay.—On December 9, 1953, at The Patch, Warcham, Dorset, Kilcourse Jocelyn Courtenay, L.R.C.P.&S.Ed., L.R.F.P.S., aged 89.
Davis.—On December 3, 1953, John Warren Davis, M.R.C.S., L.S.A., formerly of 75, Gloucester Place, London, W., aged 93.
Duncan.—On November 17, 1953, Norman Alistair Duncan, M.B., Ch.B., of The Gables, Long Melford, Suffolk.

Indirect Hernia in Children

Q.—Is it sufficient when dealing with a small indirect inguinal hernia in a child or young adult simply to excise the sac?

A.—For the great majority of such cases most surgeons regard simple excision of the sac as quite adequate. However, even in a child or young adult it is important to correct any stretching of the internal ring. Repair of the transversalis fascia is therefore important in any case in which there is a broad-necked sac with a large internal ring.

Professional Secrecy in Evidence

Q.—Is it still necessary to remind the judge of the absolute secrecy enjoined on a medical man when called as a witness in a case involving V.D. patients (*Garner v. Garner*, "Times Law Reports," 1919-20, 36, 196)? If so, has this formal protest to be lodged before being sworn in, and what wording would you recommend?

A.—Notwithstanding the rule of professional secrecy, a medical man has always had an overriding obligation to answer questions put to him in the witness box; the law in this respect has not changed. Nevertheless, if a medical witness is asked a question which, if answered, would in his opinion constitute a breach of professional confidence, it is desirable to remind a judge of the rule of professional secrecy observed by medical practitioners. This situation arises when the witness does not hold the consent of the patient to disclose information gained during his professional relationship with that patient. The right time to appeal to the judge is when a question is asked the answering of which would involve a breach of secrecy. The appeal might be in the following form: "My Lord, to answer this question would involve a breach of professional secrecy; am I compelled to answer it?" Most practitioners accept the judge's ruling and follow his directions. There are some practitioners, however, who are so firmly attached to the ethical rule that they would rather accept imprisonment for contempt of court than disclose the secrets of their patients in the absence of consent.

Catabolic Foods

Q.—I have read that certain foods such as some vegetables are catabolic because they require energy for their absorption. Is this view correct?

A.—This statement is probably true, although not necessarily in relation to absorption. A drink of cold water is catabolic in the sense that a corresponding amount must be lost either as urine, at body temperature, or as sweat, which during drying will cool the body by the absorption of latent heat. Some vegetables, such as melons, radishes, and lettuce, provide only about 50 calories per lb. (110 per kg.), and if all their water were evaporated from the skin nearly 300 calories would be absorbed, either from the body or from the surrounding atmosphere. In hot weather, therefore, these vegetables may cool the body rather than warm it. We must not forget, however, that tortoises can keep going for years on a diet of nothing but lettuce.

The Imperial Eunuchs

Q.—Can you tell me the Chinese method of making eunuchs? How were they selected, and at what age were they castrated? What was the reason for their great influence in the imperial courts?

A.—Castration in China goes back, so it is said, to about 1100 B.C., although it did not become what perhaps can be called an official practice till much later. Persons permitted themselves to be made eunuchs either from necessity (when they were compelled to submit under threat of force) or through poverty or even through choice. The age at which the operation was performed varied from childhood up to about 25 or later, and the methods employed do not seem to have varied much, according to the reports that have been made available to us. It is said that sometimes a form

of local analgesia was employed, but few details appear to be available. The method most usually adopted was to remove the whole of the external genitalia either with a sickle-shaped knife or by some other means. A plug was then inserted into the urethra and the wound covered in paper soaked in cold water. Healing was said to take place within about 100 days, and the mortality has been reported as being something like 4%, or even less. The influence exercised by the imperial eunuchs was doubtless due to their knowledge of court intimacies and intrigues, and to the fact that they often acted as intermediaries between the emperor and his concubines.

Will a Wig Stop Hair Growing?

Q.—Does the temporary use of a wig prejudice the regrowth of hair in a case of alopecia?

A.—The answer is no.

NOTES AND COMMENTS

Abortifacient Pastes.—Professor Andrew M. CLAYE (University of Leeds) writes: I am interested in the reply in "Any Questions?" (*Journal*, November 28, p. 1229) to the query on abortifacient pastes. The last sentence but one reads: "These pastes are neither as safe nor as efficient as is often stated, but it has to be remembered that the same can be said of nearly all methods for inducing abortion." From the use of the word "nearly" I infer that perhaps the writer knows some safe and efficient method. What is it? I am glad to say that I have no extensive experience of inducing abortion, but I have had enough to acquire a great dislike for the method of dilatation and curettage, partly because I am some fear of perforating the uterus, but even more because I am rarely certain that the uterus is empty when I have finished. In my experience, it is seldom that uterine paste fails to produce expulsion of the uterus within 48 hours, and abortion is nearly always complete. From Mr. David Maxwell's remarks at the Royal Society of Medicine on November 27, I gather that his experience has been like mine.

OUR EXPERT writes: I agree with Professor Claye that the word "nearly" could with advantage have been omitted from the sentence mentioned. It is also true that many in this country have used abortifacient pastes with satisfactory results over several years. When this matter was previously a subject for a question and a cautious answer one doctor wrote to say how surprised he was to learn of the dangers of the method—having himself used it without ill effect for more than 10 years. Within one week of writing the letter, however, he encountered two fatal cases, and he was good enough to write again immediately and to report the full details of these cases. The post-mortem findings were of the kind indicated in the warning given in the original reply (see also "Any Questions?" August 23, 1947, p. 317).

Causes of Failure of Contraceptive Diaphragms.—MARIE STOPES, D.Sc. (London, W.1) writes: May I add to your reply ("Any Questions?" November 28, p. 1229) about the fantastic failure rate of three in twenty? It suggests in addition to a six possible causes you give another also—that is, trust in a jelly instead of a grease. As the essential supplement to a diaphragm cap there is no contraceptive jelly in the world which can be relied on to give approximately 100% security, but a low-melting-point grease does give this.

Correction.—In the obituary notice of Dr. K. E. Eckenstein (*Journal*, September 12, p. 630) we were in error in saying that he was born in Alsace; he was, in fact, born in Liverpool.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Attology, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: Britmedad, Westcent, London. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: Medisecre, Westcent, London. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

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The B.M.A. in Committee**SCIENCE**

"The wish has . . . been warmly expressed and widely circulated that the members of the profession residing in the provinces should unite themselves into an Association friendly and scientific; that this Association should have for its main object the diffusion and increase of medical knowledge in every department of science and practice."

Thus wrote the *Midland Medical and Surgical Reporter* in May, 1832, as part of the announcement of the proposed formation of a medical association. The prospectus of the Association, which was advertised in the *Lancet* of July 7 of that year, twelve days before the meeting at Worcester at which the Association was inaugurated by one means or four of its five objects the dissemination of medical knowledge and the promotion of medical science. The fifth object was the honour and respectability of the profession.

No word was said in all these proceedings about medico-political activities, which have so largely preoccupied the British Medical Association, especially since the advent of National Health Insurance, or, before that, the establishment of the new constitution with its Representative Body. The compulsion of events soon made such activities necessary. But it is well to recall that the Association in its origin was a scientific body concerned primarily with the collection and publication of medical knowledge. The diversion of much of its energy into the medico-political field has led many outside people who were imperfectly informed on the subject to regard the Association as a professional union, working almost entirely for the economic and other status of its members. This impression is the more unfortunate, because it overlooks the vast amount of scientific work which the Association has undertaken, even during some of the most controversial periods in its history. Some of its greatest leaders, occupied closely as they were in their time with medico-political activities, declared that they looked forward to an era when the medical services in this country would be so satisfactorily adjusted that conflict might die down and the Association resume more completely its primary role. Even as it is, despite change and struggle, it has managed to carry out scientific activities on a scale rivalled by few, if any, other professional bodies.

Early Scientific Activities

For nearly 80 years the Association has had among its standing committees a Scientific Committee, formerly called the Scientific Grants Committee. In the seventies of the last century the Council resolved to allocate a definite proportion of the Association's income for the encouragement of direct scientific investigation, and it did so in the first place

by the award of grants and scholarships which were almost the first of their kind in medicine. The sum originally allocated was small, but it grew under the careful recommendations of the committee. Within a few years the grants were numerous, and some of the recipients bore names which afterwards became famous.

The Science Committee consists now of 11 members, four of whom are elected by the Representative Body and six by the Council, with one other appointed by the Journal Committee. Its powers and duties are defined as the consideration of questions concerning the work of the Association for the promotion of medical and allied sciences, including the award of scholarships and grants and the management of the library. The library itself, with its more than 65,000 volumes and its unrivalled collection of 1,600 medical periodicals every year, is an undertaking which might well absorb the energies of a committee.

Prizes and Scholarships

Of the Association's prizes and scholarships which the committee has in its charge the most noteworthy is that which bears the name of the founder. The Sir Charles Hastings prize is awarded annually for the best essay by a general-practitioner member of the Association on a theme which is the result of systematic observation, research, and record in general practice. To this has been added, for the next best essay, a second prize bearing the name of a former chairman of the Representative Body, Dr. C. O. Hawthorne. Two prizes offered biennially bear the names of a former treasurer of the Association and his wife, the Nathaniel and Katherine Bishop Harman prizes, the former for research in consulting practice, and the latter to encourage study and research directed to the diminution and avoidance of the risks to health and life which are apt to arise in pregnancy and child-bearing. The Stewart prize, also biennial, is in recognition of important work done on the origin and spread of epidemic disease. In its time this prize has been awarded to men like Patrick Manson, Robert McCarrison, and Almroth Wright. A prize is also offered to encourage interest and research in the field of occupational health. The Middlemore prize is offered biennially for the best essay or work in ophthalmology. It has been gained in past years by such ophthalmologists as Herbert Parsons, Treacher Collins, and Duke-Elder. There are also annual prizes for medical students on subjects chosen by the Council on the Committee's recommendation and annual prizes for nurses in various categories.

Of the scholarships awarded, two—one of them named after Ernest Hart, a former editor of the *Journal*, and the other after Walter Dixon, a great pharmacologist, who was himself one of the chief advisers of the Association in regard to scholarships and scientific grants—are of £250 each, and there are up to four research scholarships, each to the value of £200, but the question of these scholarships is at present under review. Another award is the Insole

scholarship of the value of £250, awarded biennially for research into the causes and cure of venereal disease.

Famous Names

In the long list of Association scholars one notices such famous names as Watson Cheyne, Ralph Stockman, E. N. Starling, J. S. Risien Russell, G. Elliot Smith, John H. Parsons, and scores of others who afterwards attained an international reputation.

Among its other duties the Science Committee has the arrangement of Association lectures. It is a court of reference for innumerable questions attaching to medical science which reach Headquarters. For example, a current problem concerns access by the public to hormone preparations. The Science Committee took part in a meeting with representatives of the Royal College of Nursing and the Pharmaceutical Society to discuss the availability to the general public, without a medical prescription, of sex hormone preparations and the possibility of safeguards for the future against a too easy availability of these substances. It also co-operates with the British Standards Institution, and with the British Pharmacopoeia Commission in connexion with proposed inclusions in new editions of the *British Pharmacopoeia*.

Collective Investigations

One of the great contributions the Association has made to medical science has been by means of collective investigations. These investigations have sometimes been very highly organized, at other times more loosely, and they have usually been entrusted to special committees set up for the purpose, with some members at least who are experts in the special field. One of the first of such inquiries, undertaken as long ago as 1874, concerned the special dangers of chloroform, and this was followed by a series of inquiries into anaesthetics in general. The matter was put on a more effective basis after 1880, when the then President of the Association, Sir George M. Humphry, suggested in his address at the Cambridge meeting that the Association should undertake the collection of facts relating to diseases in a careful and systematic manner. A year or two later this work was begun, and inquiries into pneumonia, chorea, and acute rheumatism were the first undertaken. Among the many subjects which have since been investigated and made the subject of special reports have been ophthalmia neonatorum, the early recognition of uterine cancer, rheumatic heart disease in children, the causation of puerperal mortality and morbidity, psychoanalysis, mental deficiency, the care and treatment of the elderly and infirm, the cause and treatment of arthritis, aspects of nutrition (especially in wartime), and many others.

Three noteworthy investigations took place at the end of the 'twenties, one of them on the treatment of varicose ulcers, another on the after-history of gastro-enterostomies, and the third on the treatment of cancer and its history after treatment. In 1935 there appeared the report of a committee on fractures, and other reports have been on miner's nystagmus, on the spa in medical practice, and, after the 1939-45 war, on rehabilitation.

Work of Divisions and Branches

In any survey of the work done by the Association under the category of science the work of the Divisions and Branches should be remembered. In the Branches, as in the Association in general, the original emphasis was on scientific work, which is not surprising, as many of the Branches were formed from local medical societies which devoted their meetings to clinical and scientific subjects. This went on until about fifty years ago, at the time of the reform of the Association, when, with the necessary formulation of medico-political policies, more and more local meetings came to have a medico-political character. Later, however, the clinical and scientific meetings re-asserted their interest, and they now form a great factor in keeping the local practitioner familiar with medical progress.

CRICKET

B.M.A. v. LAW SOCIETY AT HURLINGHAM, JULY 5

LAW SOCIETY	
T. M. Sutton-Mattocks, l.b.w., b. Clarke	50
J. N. Dennis, c. Barwell, b. Rice	59
S. Williams, b. Clarke	8
G. V. Jaffe, b. Clarke	0
D. Small, b. Clarke	13
A. L. Wright, not out	46
P. Clarke, l.b.w., b. Clarke	0
S. Mundy, not out	27
Extras (b. 16, l.b. 2, n.b. 1)	19

Total (for 6 wks. dec.)

BOWLING.—Clarke 23-2-72-5; Hodgkinson 11-4-34-0; Shaddick 14-2-52-0; Rice 6-0-29-1; Barwell 3-0-7-0.

B.M.A.

J. D. Williams (Guy's Hospital; Wanderer's C.C.), b. Dennis	2
P. C. Rushton (London Hospital; M.C.C.), b. Small	48
N. H. Harris (Middlesex Hospital; London Nomads), b. Clarke	0
H. K. Ashworth (Manchester University; Airborne Field Regiment), b. Clarke	1
H. F. Melhuish (University College Hospital; Brentham C.C.), c. Grundy, b. Clarke	0
G. Barwell (Guy's Hospital; North Middlesex C.C.), c. and b. Clarke	71
D. Rice (St. George's Hospital; Royal Navy), c. and b. Clarke	38
C. B. Clarke (Guy's Hospital; West Indies XI), l.b.w., b. Clarke	20
J. A. Dew (London Hospital; Horsham), not out	32
R. A. Shaddick (London Hospital; M.C.C.), not out	0
Extras (b. 8, l.b. 5)	13

Total (for 8 wks.)

H. L. Hodgkinson (St. Bart's Hospital; Grasshoppers) did not go in.

BOWLING.—Clarke 13-1-37-6; Dennis 6-1-25-1; Small 12-1-58-1; Malden 6-0-29-0; Mundy 5-0-32-0; Williams 5-0-31-0.

GENERAL MEDICAL SERVICES

MEDICAL EXAMINATION OF STUDENT NURSES

From time to time the General Medical Services Committee receives inquiries about whether a fee is payable for a report to a hospital on the state of health of a girl wishing to be accepted for training as a student nurse. From discussions with the Ministry of Health and inquiries which have been made it is clear that a large number of hospitals do not ask for a report from the applicant's own doctor but rely on examination at some stage by the hospital's own medical staff.

Fee Payable

The Ministry does not wish to interfere with the arrangements and requirements of individual hospitals, but it has assured the Committee that hospitals have full authority to pay a fee up to a maximum of one guinea for reports which they require from an applicant's general practitioner. This fee is payable by the hospital either to the applicant or direct to the doctor furnishing the report.

Notification of Cause of Death

There has been doubt about whether it is part of a general practitioner's terms of service to obtain details of the cause of death and to insert these details on the medical record envelope.

The G.M.S. Committee has been informed by the Ministry of Health that there is no specific obligation on doctors to obtain the details of the cause of death. Provided that when forwarding the medical record to the executive council the general practitioner gives all the information readily at his disposal, he will be regarded as fulfilling his terms of service.

Correspondence

The G.P. and the Industrial Medical Officer

SIR,—Dr. F. H. Tyrer's letter (*Supplement*, June 27, p. 314) appearing in the issue of the *Journal* containing at page 1437 your leading article on "Teamwork in General Practice" calls for some comment. Perhaps it is not inappropriate that some should be offered by a fellow industrial medical officer with a high regard for Dr. Tyrer's organization, and one who works in an area in which a significant general-practice experiment is being started. I refer to the Corby Diagnostic Centre projected by the Nuffield Provincial Hospitals Trust to provide facilities for the general practitioner going far to meet the ideal suggested by the Minister of Health. Modesty may forbid the general practitioners to draw attention to the fact that the concept of the diagnostic centre, and the acceptance of more work and greater responsibility therein, is their own idea. Here is a new conception put forward by the general practitioners, endorsed by the consultants, with general support from the regional hospital board, and broad-minded acceptance by the local health authorities. This is teamwork with the general practitioners in the centre if not the lead.

This brings me to my criticism of Dr. Tyrer's letter, and possibly of the attitude of many industrial medical officers. It has been stated by many of these and, if I understand him rightly, it is implied by Dr. Tyrer that the good of the patient comes before ethical rules. The rules of medical ethics and, I believe, of etiquette, which are sometimes confused with them, act always in the long run towards this end. Often the worst harm that can befall a patient is that his doctors should quarrel over him. Unless the present rules are applied by the industrial medical officer this will sooner or later happen.

The rigidity of the rules is modified by the relationship of the industrial medical officer to the general practitioner which will, in turn, depend on the confidence of the latter in the loyal co-operation of the former. No harm can be done despite difficulties from present inadequacies in the Health Service if the industrial medical officer regards the general practitioner as the "leader of the team" and treats him with due courtesy and, above all, understanding. By no means all industrial officers have sufficient experience of general practice to realize that one of the arts of that sub-ject is to know when to examine, when to defer examination, and when to ignore a demand for examination. Without this experience the industrial medical officer may find himself unwittingly proffering an implied insult in examining another man's patient. He may unknowingly find himself encouraging that bane of general practice—the disloyal patient—and be himself entrapped.

There is an attitude of mind which we cultivate in our industrial medical service which renders the present rules, if not ideal, at least acceptable—i.e., "Everything that we can do for a patient we do on behalf of his own doctor." When we accept this the mark of our success is not the number of patients that find it "convenient" to consult us, but the number of general practitioners who welcome our co-operation and advice on matters affecting work. If we succeed we have not only worked towards keeping the general practitioner as leader of the team, but justified our inclusion in the side.

I should like to be allowed to add a word from experience, lest I be thought to be advocating "working to rule." My for the usual motives of that method in bargaining. My experience, which I know Dr. Tyrer shares, possibly with more frequent success, is that when the right relationship is achieved with a general practitioner he regards us as partners in his work. In such a case the rules of etiquette are applied as though between friendly partners, and the ethics remain as those governing the whole conduct of our profession.—I am, etc.,

G. MACBAIN.

Gretton, Northants.

Extraordinary General Meeting

SIR,—Dr. R. W. Cockshut's reply (*Supplement*, July 4, p. 9) to Dr. W. J. Grant is, unintentionally, amusing and revealing. His "main contention" is that the requisitionists "called a meeting of 67,905 people, in a hall capable of holding 775, in an attempt to upset the policy of the Association."

Are requisitionists, then, to wait until a hall capable of holding 67,905 people has been built, before calling for an Extraordinary General Meeting? And if spontaneous and sustained anger among doctors throughout the kingdom in a matter so important as their livelihood is not sufficient reason for such a meeting, what is? The weather?

In fact, the policy of the Association was upset—not by the requisitionists, but by those selfsame people who had established it, our leaders. It was upset (or ignored, which amounts to the same thing) because our leaders assented to the Minister's assertion that he would not be bound to the Danckwerts award unless there was agreement in the Working Party. What a weapon our leaders put then into the Minister's hands! It became for him a case of "Heads I win, tails you lose." And lose we did. For, despite the larger cheques many are receiving now, we did lose; the Association was obliged to jettison its declared policy of loading payment for the first thousand patients. Up to the moment of the Working Party's first meeting—and it needed very few meetings, since our leaders had already surrendered power—the declared policy of the British Medical Association was for loading on the first thousand patients. The General Medical Services Committee, the Special Conference of Local Medical Committees, and the Annual Representative Meeting, all of them in 1949 (the only time when the profession ever gave—and never again will be able to give—unbiased consideration to the matter) adopted and urged loading on the first thousand. Drs. Dain and Wand, to name only two, spoke forcefully for it. But it was discarded amid the loud jubilation; the small-list man was silently betrayed.

If, as Dr. Cockshut says, there was sharp practice, surely it was there and then. And I suspect it is his troubled conscience that makes him turn so vehemently on the requisitionists. I am reminded of the East European newspaper which, describing a scene when a man tackled an escaped lion, carried the headline: "Liberal attacks defenceless lion."—I am, etc.,

London, E.8.

CHARLES SCHIFF.

SIR,—True, other speakers voiced their own personal views, as they had every right to do, when the meeting was thrown open to general discussion. I hold no brief for those. Nevertheless, Dr. Charles I. Schiff and myself had been chosen by the committee, representing the requisitionists and the aggrieved practitioners, as seconder and mover respectively of the resolution to be presented to the meeting; and the Association, being so informed, accepted this arrangement and officially allotted to us our times for our speeches. When, therefore, Dr. R. W. Cockshut in two early paragraphs of his letter (*Supplement*, June 13, p. 279) criticized what he wrongly purported to be the case put by the signatories without indication of what speeches he was criticizing, the legitimate inference was that he was opposing the arguments voiced by the requisitionists' specifically accredited speakers. I therefore corrected Dr. Cockshut's erroneous paraphrase of our arguments. He now replies (*Supplement*, July 4, p. 9) that he was not criticizing my presentation of the aggrieved practitioners' case, and says he has not the knowledge "necessary to deny, defend, or resolve anything." In this case, it is difficult to understand why he mentioned me by name in the penultimate paragraph of his first letter, attributing to me views I do not hold. I will not, therefore, further pursue this aspect of his letters.

Further, he alleges something sinister in the calling of the meeting, incorrectly stating that the requisitionists called it at a hall which would not accommodate 67,000 people. We did nothing of the sort. We sent a requisition to B.M.A. Council for a general meeting, as provided for in the Act of Parliament

governing limited liability companies' conduct of their affairs; but it was the Council which decided the venue of the meeting. Nevertheless, quite contrary to Dr. Cockshut's unworthy insinuations, we were genuinely disturbed lest the venue might not accommodate the numbers who might attend; and we addressed a letter to the Secretary to this effect. We were told the accommodation would presumably prove ample, as in fact it did. B.M.A. Council has now called another Extraordinary General Meeting for July 13 in City Hall, Cardiff. Does Dr. Cockshut see anything sinister in the fact that that hall also will accommodate only a fraction of 67,000 people? If so, why? If not, what was sinister about the May meeting venue?

Nor was there anything sinister in asking our Association to reconsider the distribution scheme. If, as we are prepared to argue, that scheme diverts to other purposes large sums of money which, under the Danckwerts award, we contend should rightfully be paid to small-list practitioners in some proportion to the numbers on their lists (so honouring the declaration of the present Minister of Health that "doctors have an unanswerable case for increased remuneration" and the declaration of the G.M.S. Committee that the Danckwerts award had "made it clear that general practitioners had been substantially underpaid since the Health Service began"), what was there of wrong in the calling of a general, perfectly legal meeting of our colleagues to present the case for their consideration and endeavour to secure at least a postponement of the implementation of what we consider to be an injustice until a more equitable scheme might be considered? Under what moral or other canon is it wrong for some thousands of honourable professional men to seek redress, by utterly legal and orderly methods, for what they consider to be a great injustice? If such a course be denied them, what means have they available to secure their rights? Possible legal action in the Courts would be highly undesirable.

We are not seeking something for nothing for those who, under the Working Party's scheme, are left with no share in the award their numbers have attracted to the central payment pool. They ask only an increase of remuneration, to which the Minister has by clear implication indicated they are entitled. If Dr. Cockshut applied himself to assisting to ensure that increase, it would be more creditable than imputing to others motives and intentions they neither consciously nor unconsciously entertain.

Finally, I would seriously advise Dr. Cockshut not to formulate or express in writing any charge of "sharp practice" to which he obliquely refers. If he does so, my answer will be swift, certain, and definite.—I am, etc.,

Shrewsbury.

W. J. GRANT.

SIR,—Dr. W. J. Grant, in his reply (*Supplement*, June 20, p. 291) to Dr. R. W. Cockshut (*Supplement*, June 13, p. 279), states: "If 1,500 patients are to draw a 'bonus' of £500 per year to their practitioner, why not at least £250 'bonus' for the practitioner with a 750 list? If not, will Dr. Cockshut tell us why?"

I can tell him why. They are both drawing the same rate of "bonus" after the first 500. Therefore why should the G.P. who is getting his £500 "bonus" on 1,500 patients (2,000 total) look after the first 500 at the low rate, and the G.P. with the 750 list look after his total number of 750 at the "bonus" rate?

Please keep to the point, Dr. Grant.—I am, etc.,

Cosham, Hants.

E. SLADEN.

The B.M.A. and the Public Health Service

SIR,—I have read the article on public health, in the series "The B.M.A. in Committee" (*Supplement*, June 20, p. 289), with no little amazement. In it, the claim is made, no doubt correctly, that many advances in the country's public health arrangements have resulted from suggestions made by the Association. No mention is made, however, of the Association's responsibility for suggesting a national health service, nor for omitting to secure Spens Committee conditions for its members in the public health branch of that service. This omission has led directly to the tardy and meagre pay award to this branch.

Probably the facts of the case are not generally known to the profession. Briefly they are as follows. Every assistant

medical officer of health, from June 1, 1953, receives a salary similar to that of a senior registrar, and this is the grade from which the majority of public health recruits eventually retire on pension. No senior assistant medical officer is as well paid as those in the S.H.M.O. grade, though their qualifications, experience, and responsibility often exceed those required of the S.H.M.O. A very large number of medical officers of health, who are doing specialist work and are in charge of their departments, do not receive the salary of the S.H.M.O. Nobody in public health received the benefit of retrospection when the salary award was made, it only operated in full from April, 1951. No, there was no Danckwerts award for public health. To refer to this award as "disappointing in some respects" is to be guilty of a terminological inexactitude. In fact, the award is the direct and inevitable consequence of the failure of the Association in its duty toward a section of its members. And it bids fair to be the death blow to the public health branch, which has served the country so well for so long. If this is the Association's "considered public health policy," the sooner the Society of Medical Officers of Health puts its trust elsewhere the better.—I am, etc.,

Elgin.

I. C. MONRO.

Association Notices

Diary of Central Meetings

JULY

- 11 Sat. Council (at Cardiff), 9 a.m.
- 11 Sat. Annual Representative Meeting (at Cardiff), 10 a.m.
- 13 Mon. Annual Representative Meeting (at Cardiff), 10 a.m.
- 13 Mon. Annual General Meeting (at Cardiff), 12.30 p.m.
- 13 Mon. Extraordinary General Meeting (at Cardiff), at conclusion of A.G.M.
- 13 Mon. Council (at Cardiff) at conclusion of A.R.M.
- 13 Mon. Board of Trustees, British Medical Guild (at Cardiff), at conclusion of Council.
- 13 Mon. Adjourned Annual General Meeting and President's Address (at Cardiff), 8.15 p.m.
- 22 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
- 23 Thurs. G.M.S. Committee, 10.30 a.m.
- 29 Wed. Executive Subcommittee, Joint Formulary Committee, 2 p.m.

OCTOBER

- 2 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.

Branch and Division Meetings to be Held

MID-ESSEX DIVISION.—At Nurses' Dining Hall, St. John's Hospital, Wood Street, Chelmsford, Saturday, July 18, 7.30 for 8 p.m., annual supper followed by annual general meeting.

MONMOUTHSHIRE DIVISION.—At St. Mellons County Club, Tuesday, July 14, 5.30 to 7 p.m., cocktail party.

SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Wednesday, July 15, 8 for 8.30 p.m., general meeting. Address by Dr. G. S. Graveson: "Poliomyelitis."

WEST NORFOLK DIVISION.—At Ingoldisthorpe Manor Hotel, Friday, July 10, 7.30 for 8 p.m., dinner. After-dinner speech by Sir Archibald McIndoe: "Plastic Surgery."

Meetings of Branches and Divisions

SOUTH ESSEX DIVISION

The annual general meeting was held at Oldchurch Hospital on June 12, 1953. The following officers were elected:

Chairman.—Dr. R. D. Milford.

Vice-chairman.—Mr. John Watt.

Secretary and Treasurer.—Dr. P. S. Steen.

A vote of thanks to Dr. E. Anthony, the late secretary, for his services to the Division since its inception was passed unanimously.

ANNUAL MEETING, CARDIFF

The Section of Child Health will meet in room 127 in University College, Cathays Park, and not in room 28 as previously notified.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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British Medical Association

PROCEEDINGS OF COUNCIL

A meeting of the Council was held in the Council Chamber of the City Hall, Cardiff, on July 11, Dr. E. A. GREGG in the chair.

Congratulations were accorded to the members of the Association whose names had figured in the Coronation honours, and also to Sir Hugh Linstead, M.P.

The deaths were announced of Mr. R. G. Hogarth, Vice-President of the Association and a former President, and of Lieutenant-Colonel Arthur Martin-Leake, V.C. and Bar, and Gold Medallist of the Association. The members stood in silence as a tribute.

The Chairman of Council reported that he had sent a telegram of congratulation to Dr. L. G. C. Pugh, senior member of the Association in the Mount Everest Expedition.

A letter was read from the Honorary Secretary of the Worcester and Bromsgrove Division expressing thanks to the Council for the opportunity of looking after the silver tray which was originally presented to Sir Charles Hastings, and which the Association has acquired. "We will cherish it and see that it is on display at every local B.M.A. function."

The following names were put forward for the consideration of the Minister in connexion with the filling of vacancies on the General Nursing Council caused by the expiration of the term of office of certain members of the Council in September next: Mr. A. Staveley Gough, Dr. T. Rowland Hill, Mr. H. H. Langston.

Dr. G. Clark Trotter was appointed the Association's delegate to the forthcoming conference of the National Smoke Abatement Society.

It was reported that a group consisting of the Chairman of Council, the Chairman of the Representative Body, and the Chairmen of certain interested committees had met and considered the evidence to be given to the Ministry of Health Committee which has been set up to review the cost of the National Health Service. The group considered that it was necessary to invite the standing

committees specially interested in the problem to express their views on the evidence to be given. It was also proposed that the Scottish Committee should prepare evidence relating to the Service in Scotland, and present it to the Guillebaud Committee when it was sitting in Scotland. The group of chairmen is to be kept together as a steering and co-ordinating committee.

Arrangements were reported for a dinner to be given at B.M.A. House to the members of the World Medical Association Council meeting in London in August.

Preliminary reports from the Arrangements Committee for the Glasgow Meeting, 1954, and the Toronto Meeting, 1955, were approved.

The Science Committee submitted revised conditions which should apply to B.M.A. essay competitions, and these were approved.

The Central Ethical Committee brought forward a recommendation for submission to the Representative Body on the question of the loan of hospital records to Government Departments. This matter subsequently came before the Representative Body (see report of Monday's proceedings, *Supplement*, July 18, p. 49).

The catering establishment at B.M.A. House was the subject of a report from the Office Organization Committee. Certain recommendations were agreed to under which the management of the whole catering establishment is to be vested in a special committee composed of the officers of the Association and five members appointed by the Council, at least one of whom should be a woman.

Appreciation was expressed by the Council to Messrs. Harold Whitehead & Partners for their valuable services in connexion with the investigation of the departments at B.M.A. House.

The business of the Council had to be compressed within one hour in view of the early start of the Representative Meeting, and consideration of certain parts of the agenda was deferred to the next meeting on July 13.

First Meeting of New Council

The first meeting of the new Council was held in the Council Chamber, City Hall, Cardiff, on July 13, at the conclusion of the Annual Representative Meeting. The reports of certain committees which had been postponed owing to pressure on time at the meeting of July 11 were presented by the respective chairman and approved. The Council then proceeded to the election of its Chairman, and on the proposition of Mr. A. M. A. MOORE, Dr. E. A. GREGG was unanimously and with acclamation re-elected.

The CHAIRMAN proceeded to welcome and introduce the new members of Council—namely, Sir John McNee, the President-Elect, Dr. H. D. Chalke, Dr. T. W. Davies, Dr. Neil Douglas, Dr. H. G. Dowler, Dr. J. O. M. Rees, and Dr. J. T. Rice Edwards. He also expressed regret at the retirement from the Council of an equivalent number of members, and thanked them for their services.

The Council adopted Standing Orders and resolutions relative to its business. The minutes of the Annual Representative Meeting were examined and it was decided that there was no reason to take a referendum on any of its decisions. The members then proceeded to vote by ballot for the election of Council members on Standing Committees, and to reappoint the Special Committees. The work of each of the Special Committees was reviewed, and where the reference was still undischarged they were reappointed, in some cases with a slight rearrangement of personnel. The number of Special Committees, including Joint Committees with outside bodies, was 26.

With regard to the Constitution Committee, which a resolution of the Representative Body instructed the Council to set up, it was decided to postpone the appointment until the next meeting of Council in order to give time for consideration as to the best selection of members.

The Council discussed at some length the policy with regard to meetings of committees during the session 1953-4. The practice in the last session was that, apart from the Central Consultants and Specialists, General Medical Services, Public Health, and Finance Committees, only two firm dates should be allocated to committees for meetings during the session, on the understanding that any committee could be called at additional dates if found necessary, and that any urgent business between meetings should be delegated to a small executive subcommittee with power to take action and to report to Council. The necessity of continuing economy despite the improvement in Association finance was stressed. On the motion of Dr. WAND, seconded by Dr. I. D. GRANT, it was agreed to revert to the normal number of meetings in the schedule of committee dates for the new session, but to include certain dates in brackets to indicate that meetings arranged for these dates would be cancelled if not found absolutely necessary.

Dr. Frank Gray and Dr. W. Woolley were reappointed as representatives on the council of the Society of Medical Officers of Health, and Dr. H. Guy Dain (or his deputy), Dr. K. Cowan, and the Secretary of the Association as representatives on the Civil Service Medical Officers Joint Committee.

A letter was read from the General Secretary of the Canadian Medical Association accepting the invitation for a meeting conjointly with the British Medical Association in England in 1959, and adding that his Association had instructed him to invite the B.M.A. to nominate one of its members as President of the Canadian Medical Association for that year. It was requested that the nomination should be made before June 1, 1957. The Council agreed that a letter of thanks be sent to the Canadian Medical Association and that consideration be given to the question of nomination at a later meeting.

The Secretary also read a letter which had been received from the New Zealand Branch suggesting the holding of the Annual Meeting in that Dominion in 1959 or 1961 in conjunction with the New Zealand Biennial Conference. It was

agreed to thank the New Zealand Branch and to inform them that the earliest date that could be considered was 1961, and that the matter would come forward at the next meeting of Council.

BRITISH MEDICAL GUILD

A meeting of the Trustees of the British Medical Guild followed the Council meeting. Dr. Gregg was reappointed chairman, Dr. Frank Gray treasurer, and the executive committee was re-elected. A statement was made on the financial position of the Guild Trust Fund.

ADJOURNED ANNUAL GENERAL MEETING

The Adjourned Annual General Meeting was held in the Park Hall Cinema, Cardiff, on the evening of July 13. The President of the Association, Mr. J. W. TUDOR THOMAS, presided, and was accompanied on the platform by the Lord Mayor of Cardiff (Sir James Patrick Collins), the immediate Past President (Dr. P. T. O'Farrell), the President-elect (Sir John McNee), and the principal officers of the Association. Most of the members in the very large assembly were in their academic robes.

Introductions

The CHAIRMAN OF COUNCIL (Dr. E. A. Gregg) introduced to the President the following delegates from kindred Associations:

Austrian Medical Association, Dr. W. DEMUTH
Danish Medical Association, Dr. JACOB RAFT
Irish Medical Association, Professor W. J. O'DONOVAN
Medical Association of South Africa, Dr. J. P. DE VILLIERS and Dr. M. H. DE VILLIERS
Medical Association of Thailand, Dr. SMAI CHIANDAVIMOL
Pakistan Medical Association, Dr. MUNAWAR ALI
West German Medical Association, Dr. RUDOLF WEISE and Dr. J. KEHRINGS
Swedish Medical Association, Professor A. WALLGREN

This was followed by the introduction of representatives of Overseas Branches of the Association:

AFRICA

Dr. K. V. ADALIA, Kenya Branch
Dr. A. F. TUBOKU-METZGER, Sierra Leone Branch
Dr. A. A. LOVELL, Tanganyika Branch
Dr. A. B. RAPER, Uganda Branch
Dr. KEITH D. YOUNG, Zanzibar Branch

AUSTRALIA

Dr. E. A. TIVEY, New South Wales Branch
Dr. J. G. HUNTER and Dr. L. D. WALTERS, Queensland Branch
Dr. C. H. DICKSON and Dr. W. J. FLANAGAN, Victoria Branch

FAR EAST

Dr. J. MACKINTOSH and Dr. F. PARAMPALAM, Malaya Central Division
Dr. R. A. PALLISTER and Dr. LOH GUAN LYE, Malaya Northern Division
Dr. R. J. GROVE-WHITE and Dr. MARY GROVE-WHITE, Malaya Southern Division

MEDITERRANEAN AND MIDDLE EAST

Dr. N. H. SKELTON-BROWNE, Aden Branch
Dr. W. M. FORD-ROBERTSON, Middle East Branch

WEST INDIES

Dr. WILBERT J. S. WILSON, Jamaica Branch
Dr. L. R. WYNTER, Leeward Islands Branch
Mr. J. HENRY PIERRE, Trinidad and Tobago Branch

Mrs. O'Farrell then invested Mrs. Tudor Thomas with the President's Lady's Badge.

Presentation of Prizes

The PRESIDENT presented to the recipients the various Association prizes as follows:

The Sir Charles Hastings Clinical Prize to Dr. M. J. Cookson, of Gloucester, for an essay on "A Survey and Commentary of Certain Aspects of Obstetrics of Importance to the General-practitioner Obstetrician."

The Occupational Health Prize to Dr. R. McL. Archibald, of Northwich, Cheshire, for an essay on "Perforation of the Nasal Septum due to Soda Ash."

The Dawson Williams Memorial Prize to Dr. Helen M. M. MacKay, of London, in recognition of her researches on nutritional disorders in early life.

Prizes were presented to the following student nurses for an essay on "Is Nursing a Vocation?": Mildred P. Simson, Royal Northern Hospital, London, and Barbara M. Jamieson, West London Hospital; to the following State-registered nurses working in a hospital, for an essay on "The Role of the Married Nurse in the Hospital Service": Phyllis M. Kynaston, University College Hospital, London, and Gertrude E. Prior, Leicester General Hospital; and to the following State-registered nurse not working in a hospital, for an essay on "The Psychological Approach to the Patient": Mrs. Ethel Forrest, Heston, Middlesex.

Prizes were presented to the following medical students for an essay on "A Good General Education is a Necessary Preliminary to a Medical Career": Mr. T. R. Boyde, University College Hospital, Mr. R. D. Hyde, St. Thomas's, Mr. R. Portal, Middlesex, Mr. P. J. Taylor, St. Thomas's.

President's Address

The PRESIDENT then delivered his address from the Chair. The address was published in the opening pages of the Journal last week.

At the close of the address Dr. S. WAND, Chairman of the Representative Body, in moving a vote of thanks, said that Mr. Tudor Thomas had had a very distinguished academic career, and had done great work in ophthalmology. But he was also a man who had endeared himself to everyone with whom he came in contact. He had found time to help in the work of the Association, and had served on local and central committees and on the Council. Cardiff was very proud of the honour bestowed on him that day, and they in the Association were proud to have him as their President.

The remarks of Dr. Wand were endorsed by hearty applause.

President's Reception

The President's Address was followed by a reception at the National Museum of Wales, where Mr. and Mrs. Tudor Thomas received 1,250 guests. The museum, a treasure-house of Wales, was open for inspection, and for the entertainment of those attending a selection of Welsh music, with the harp, was given by Osian Ellis in the Wilson Gallery, and cinematograph films depicting Wales were shown. Refreshments were served in a marquee.

OVERSEAS CONFERENCE

UNQUALIFIED PRACTICE IN THE COLONIES

The Overseas Conference in connexion with the Annual Meeting was held at the City Hall, Cardiff, on July 15, with Mr. J. L. GILKS, Chairman of the Overseas Committee, in the chair. The President of the Association and the Chairman of the Representative Body were present.

The SECRETARY of the Committee (Dr. E. Grey Turner) gave his usual annual survey. He first explained the composition of the Overseas Committee. It consisted of the four officers of the Association *ex officio*, seven representatives of overseas constituencies elected by the ordinary democratic machinery of the Association, two by three years, two members appointed by the Council, two by the Representative Body, and one by the Organization Committee, with power to co-opt two additional members for areas not otherwise represented. The Chairman of the Committee for some years had been Mr. J. L. Gilks, to whom the overseas members owed a tremendous debt. The work of the Committee consisted principally in looking after the affairs of the overseas Branches in the Colonies and the foreign countries. It had no need to worry much about the affairs of the corporate Branches in the Dominions, which seldom required any assistance from Headquarters. The

Committee, however, always had to bear in mind that quite a large number of members were living in areas where there was no Association Branch.

With regard to the representation of overseas constituencies in the Representative Body, the old system of representation whereby each Division was a constituency for the Representative Body gave rise to curious anomalies. For example, the New Zealand Branch included seventeen Divisions, each of which was entitled to send a representative, yet the powerful New Zealand Branch itself was not entitled to send anybody. The same applied to Malaya. By resolution of the recent Representative Meeting, the Branches had been made the units for this purpose, with the same plan of representation as Branches in the United Kingdom, but with an upper limit of three.

Future of the Colonial Medical Service

Dr. Grey Turner went on to say that hitherto the British Commonwealth had consisted of (1) self-governing countries which had their own universities and medical schools, and (2) non-selfgoverning countries which had no medical schools or very small ones, and were not able to meet their own requirements for doctors. A new phenomenon was about to appear. In the near future countries which had not been able to supply their own requirements for doctors were going to be promoted politically into the self-governing category. This was the case with the new Central African Federation, consisting of the Rhodesias and Nyasaland, which had no medical schools, the Gold Coast, which could not afford a medical school for some years to come, and certain other areas. On the other hand, in the Caribbean, where it was possible that in the near future the Colonies would federate and form a new self-governing dominion, West Indian doctors had for many years past come to Great Britain and qualified, and they had their own medical school. Thus the future Caribbean Federation, and Malta also, did not fall into the category he was discussing.

A country which was independent and self-governing but could not supply its own requirements for doctors could adopt one of two policies. It could adopt a policy of self-sufficiency, making use of such qualified doctors as it had, and in addition granting a bare legal recognition to semi-trained doctors, registering dispensers, osteopaths, herbalists, and so forth. There was a proposal now before the Legislative Council of the Gold Coast to carry out precisely that policy. This created a situation such as they had never had to face before. Let it be assumed that in spite of protests this proposed law in the Gold Coast came into force. If the Association condoned it, it was all against their traditions. Moreover, association with an unqualified practitioner was a serious ethical offence for which the practitioner was liable to be summoned before the General Medical Council. On the other hand, supposing the Association black-listed the country, it might be argued that that was only making matters worse. A decision on this question would not be taken until events required it, but his Committee would be glad to have any views on the subject from the present Conference.

The second policy which such a country might follow was that of recruitment from abroad. It could recognize that it was not self-supporting, and must bring in doctors from other countries. Such a policy had certain implications. If a country wanted to attract doctors from abroad it must offer terms which would make it worth their while to settle there. For example, it might be found that it could obtain its own doctors for posts in the Government Medical Department at a certain starting salary, that salary might not be nearly sufficient to attract doctors from Great Britain or America, and the consequence might be that they would have two rates of pay, one rate for their own people and the other for people from abroad. Not only must the salary be sufficient but the conditions of service must be attractive. Libya, for example, last year became an independent self-governing country, and the British doctors

who had been working there were asked to remain on as employees of the Libyan Government. Quite quickly reports reached the Association of considerable dissatisfaction in the medical service and some resignations. It was found that in a new Dominion the medical service was treated in a thoroughly unsatisfactory way, what was the Association to do? Was it to condone the unsatisfactory conditions or to black-list the country? If the conditions were condoned they would be recruiting doctors for service which they regarded as intolerable; on the other hand, if they black-listed the country they were cutting off a country with which they had a tradition of friendship. For some weeks now the *Journal* had refused to accept advertisements for the Libyan Medical Service.

Thus there was a state of considerable uncertainty in some countries—the Gold Coast, Malaya, Nigeria—about the future of Government medical services. One solution suggested was short-term engagements, but these had the disadvantage that a man went out to a Colony, say in Africa, for three years, spent the first year getting acclimatized, the second year learning the language, and came back in the third year. Another possibility was to offer a full career in the Colonies, but the only way in which the Secretary of State could do that might be to form a general colonial service, employed by H.M. Government, and seconded to the various Colonies, with pay and conditions guaranteed. The whole situation bristled with difficulties. It cut right across the whole tradition of self-determination in the British Commonwealth. There might be other solutions—some middle road—and the Overseas Committee was giving deep thought to this very serious problem and had made an approach to the Colonial Office.

Geographical Survey

Finally, Dr. Grey Turner gave a brief geographical survey of the Branches. The Overseas Committee had received an agreed scheme for the unification of the Malayan Medical Service and had been hoping to receive some views from the Malaya Branch about this. The Committee had also successfully negotiated an improvement of remuneration in Borneo. The Seychelles furnished an example of a little group of unattached members whose interests the Committee had been trying to serve. The salaries of the officers there were too low. Mauritius had had a salary revision. Kenya was passing through a troubled period. One of the causes of the Mau Mau uprising had been the rapid growth of population in East Africa. The Kenya Branch had directed attention to this subject as long ago as 1947, and could claim to be six years ahead of the Kenya Government in this matter. The three protectorates in Southern Africa—Basutoland, Bechuanaland, and Swaziland—which had British doctors recruited from the United Kingdom, had been passed by in the recent salary revision and the Committee had been trying hard to put the matter right, so far without success.

The Association had three Branches in foreign countries—namely, the Sudan, the Egyptian, and the Middle East Branches. The Sudan was passing out of the Anglo-Egyptian condominium. The Committee was trying to give it all the help it could in this time of transition. The Middle East Branch, which rose from the ashes of the Mesopotamian Branch, had held an annual meeting at which a first-class scientific and clinical programme was arranged.

Cyprus was at present included in the "Important Notice"—a very regrettable state of affairs. The decision had been taken only as the last possible resort. When the Committee finished its negotiations on salaries on behalf of the large Colonies it turned its attention to the small, and as long ago as 1950 it had a preliminary discussion with the Colonial Office about Cyprus. In August, 1951, the Association submitted a comprehensive memorandum to the Colonial Office. No reply was received for nine months, and in May, 1952, the bald announcement was made of new salary scales, which had been arrived at without any proper consultation with the medical profession. The sala-

ries were considered much too low in relation to the rest of the Colonial Empire, and certain medical officers were not put on the new salary scales but on other special terms. The Chairman of the Representative Body, on his way to another conference, spent a short time in Cyprus in October, 1952, but he was not enabled to meet the Governor. Some slight improvements were made, including a recognition by the Cyprus Government that the Branch could make representations to them concerning alterations, but alterations in the scale were refused, and on May 20 the Government of Cyprus was included in the "Important Notice." The Committee felt that it was its duty after this long consideration to include Cyprus under this ban.

With regard to other Branches, the Malta Branch had produced an interesting memorandum on the future condition of the medical service in that country. They were fully alive to the problem. In the Caribbean Branches a considered reply from the Colonial Office was still awaited on the Association's proposals for a federal medical service. The Branches were well ahead in this matter.

General Discussion

Dr. P. T. O'FARRELL said that it might be necessary in some regions to employ in the medical service people who were not fully qualified, but he insisted that they should be on a separate register and not allowed to call themselves doctors. He also suggested that the Overseas Committee, owing to economic considerations, held too few meetings.

Dr. S. WAND said that the suggestion had been made that a sort of central pool should be created for the seconding of doctors in the Colonial Service. He thought that the present system could be integrated with such a pool. If there were a nucleus from which men could be seconded to certain areas it would solve some of the problems of those areas and also relieve the difficulties of absorbing these men when they came back to this country. Dr. R. A. PALLISTER and Dr. R. J. GROVE-WHITE spoke of the conditions in Malaya and the need for doctors in the Colonial Service to be assured of opportunities for appointment when returning to Britain. Some men could not get a job if they had been a number of years abroad and, so to speak, were off the ladder of promotion.

Dr. K. V. ADALIA (Kenya) spoke, as did others, on the question of training medical auxiliaries in certain regions. Dr. GREY TURNER said that the proposal lying on the legislative table of the Gold Coast was to register and grant legal recognition to people who had not had an orthodox medical course at all. Dr. W. DEGAZON said that there had been political pressure in Jamaica to put osteopaths on the register, with full status. This had been resisted, but their dental colleagues were now subject to similar pressure, the idea being to bring in unqualified dentists. It all emphasized the importance of having strong B.M.A. Branches. On this question of unqualified practitioners there could be no compromise. Mr. J. HENRY PIERRE (Trinidad and Tobago) said that on this question of unqualified practitioners, whatever the British Medical Association might do, people who had that attitude towards medicine would persist in it. The aim should be to ensure that the qualified and non-qualified were kept in separate compartments, in distinct registers. Dr. WAND suggested that registration for the non-qualified should be only for a limited term, with, if necessary, provision for extension. Dr. N. H. SKELTON-BROWNE (Aden) said that in Aden they were relatively well doctored, but the thought of unqualified practitioners being allowed to practise caused him perturbation. He had in mind some Arab practitioners in his Colony, who, when they carried out operations for cataract, for instance, obtained remarkable immediate results, but the final results were deplorable. The law in Aden allowed a dispenser to run a dispensary, but not to call himself a doctor. Dr. GREY TURNER said that what Mr. Pierre wanted was a register of medical auxiliaries, but if these unqualified people had a register nothing would stop them from getting full registration.

Dr. J. G. HUNTER (Queensland) said that the problem of the unqualified was not unknown in Australia. He spoke also of the difficulty of dealing with alien practitioners, mostly displaced persons, in Australia, in view of the large entry from Australian medical schools. In New South Wales during the last few years the average output had been 330 graduates a year, and the wastage was under 100. Dr. C. H. DICKSON (Victoria) also spoke of this problem. In New Guinea medical assistants were being employed under supervision and were doing very good work.

Empire Medical Advisory Bureau

Dr. H. A. SANDIFORD, Medical Director of the Empire Medical Advisory Bureau, spoke of the facilities which the Bureau at B.M.A. House had to offer and expressed the hope that overseas members would tell their colleagues about them and advise them to get in touch with the bureau when coming to this country.

A vote of thanks to the Chairman concluded the proceedings, and afterwards the overseas delegates attended an "At Home" given at Cardiff Castle.

The luncheon to Overseas representatives was held at the Angel Hotel, Cardiff, on July 10, when Dr. S. WAND, Chairman of the Representative Body, welcomed the visitors and Dr. J. G. HUNTER, Federal Secretary of the B.M.A. in Australia, replied.

REPRESENTATIVES' DINNER

At the conclusion of the first day of the Annual Representative Meeting, the representatives dined together at the New Continental Café, Cardiff, Dr. S. Wand presiding. Later they were joined by the ladies for a dance.

The speechmaking was by tradition limited to the proposal of the toast of the health of the Chairman. Dr. A. S. Wilson, in proposing the health of Dr. Wand, said that he did not suppose that any person had made a more extended tour of this country attending celebrations in his honour than Dr. Wand had done in recent months. It seemed strange to see Dr. Wand sitting in the Chair of the Representative Body, because it was not so many years ago that he first appeared in that assembly as a very determined critic and even something of a menace to the platform. It was never possible to smash him, for he always knew what he was talking about. He was also a man eager to enter into battle at any time and one who bore no malice afterwards. His ascent to high office in the Association was perhaps a surprise to himself. They in the General Medical Services Committee greatly regretted his departure from the Chair of that body, but they already had a deputy chairman in Dr. Talbot Rogers who had all the advantages of Dr. Wand's assistance and was proving a very worthy successor. Alluding to the number of chairmen who had come from Birmingham, Dr. Wilson said that no doubt when better chairmen could be built Birmingham would build them. Finally he paid tribute to Dr. Wand's modesty, his disclaimer of undue praise, and his ready acknowledgment of the services of predecessors and colleagues.

The toast was accorded musical honours. Dr. Wand said that they had had a memorable day. It had been suggested to him that this should be called a Royal Meeting. Some of them had been privileged to be present at the ceremonies in the City Hall, and the meeting itself that morning had elected H.R.H. the Duke of Edinburgh an Honorary Member of the Association. This was also a historic occasion on other grounds, inasmuch as it was the fiftieth meeting since the constitution of the Representative Body in 1903. To go still further back, he recalled some of the peculiar features of the organization of the Association 100 years ago, when the membership of its Council was reputed to be over 300. Much had been made of the number of Association chairmen who came from Birmingham, but in its early years the Association was governed not from Birmingham but from a neighbouring city—Worcester. A great deal had happened since then, and he thought it

could be said that those who were present at the Swansea meeting 50 years ago did a good job of work.

At gatherings of this kind in the past it had been the duty of the Chairman to make some reference to those who had formerly held office. He would content himself with referring only to a few of those who had worked as whole-time officials within the organization—Alfred Cox, George Anderson, who died in the Association's service, and then Charles Hill, during whose term of office the Association grew more rapidly than at any other period. Dr. Wand then referred in terms of warm appreciation to present members of the Headquarters official and clerical staff. He then concluded by saying that during his own experience of the Representative Meetings there had been a great improvement in the standard of speaking. He had been struck in recent years by the extremely high quality of the speeches, which were terse, well thought-out, and usually not long enough to incur the warning of the red light. He believed that the quality of speaking in the Representative Body would compare favourably with that of any other assembly in the country. He begged the younger men to come forward and serve the Association. Any sacrifice which such service involved would be more than made up by the satisfaction which the work afforded. He was grateful to the representatives for putting up with some of the difficulties which he might create from time to time, and he begged a continuance of their good will.

THE ANNUAL DINNER

The Annual Dinner at the Cardiff Meeting was held in the Assembly Room of the City Hall on July 16. About 520 members and guests assembled under the presidency of Mr. J. W. Tudor Thomas, who had on his left the Lord Mayor of Cardiff and on his right the Lord Lieutenant of Glamorgan. Grace was said by the Archbishop of Wales (Most Rev. Dr. John Morgan). Immediately after the toast of "H.M. The Queen," the President announced that a telegram had been received from Buckingham Palace:

"The Duke of Edinburgh accepts with great pleasure your invitation to him to become an Honorary Member of the British Medical Association. His Royal Highness trusts that your meeting in Cardiff has been a great success."

The toast of "The Duke of Edinburgh, the Earl of Merioneth" was then drunk.

"The City and Port of Cardiff"

Dr. S. WAND, Chairman of the Representative Body, proposed "The City and Port of Cardiff." He spoke of the unexpected beauty of the city. Its history was the history of the industrial revolution, and on this his first visit to Cardiff he had rather expected to find it shrouded in industrial gloom. Instead he had been greatly impressed by the cleanliness even of its smaller streets, while Cathays Park was perhaps the most beautiful civic centre in the world. The men who had contributed to the stateliness and prosperity of Cardiff had combined with industrial enterprise true civic pride. Cardiff had welcomed the Association in a grand way, for which they had first of all to thank the Lord Mayor and Corporation. He had attended many Annual Meetings, but never one at which the chief citizen had been more helpful or more frequently with them. It had been a wonderful meeting, and one of the most memorable things about it had been the magnificence of the civic hospitality.

The LORD MAYOR (Sir William Collins), in responding, said that they in Cardiff were indeed grateful to those who had served before them and had brought the city to its present dignity. Unfortunately Cardiff was now faced with a crisis at the docks, but they were not despondent, they accepted it as a challenge to their day and generation, and the trouble would be overcome. Cardiff was a particularly healthy city. It happened that this was the centenary year of the appointment of its first medical officer of health. In 100 years the city had had only four such officers, two of whom were still with them—Provost Ralph Picken and

the present medical officer, Dr. Greenwood Wilson. It had been a great pleasure to have the British Medical Association in their midst. He and the Lady Mayoress would be very lonely next week, for they had had the privilege of entertaining at the Mansion House nine of the medical visitors. He begged the Association not to wait 25 years before it came again.

"The University of Wales"

Sir DANIEL T. DAVIES, in proposing the toast of "The University of Wales," said that when the Association last met in Cardiff, in 1928, the Welsh National School of Medicine, one of the constituent parts of the University, was only eight years old. On that occasion the then President, Sir Ewen Maclean, had delivered an address on the theme of the increased responsibility of the medical profession in the unknown to-morrow. His words had indeed been fulfilled by subsequent events. The University of Wales, said Sir Daniel, was the first university in the Empire to establish a chair of international relationships, also the second in Britain to establish a chair of tuberculosis. He mentioned the names of some of the sons of the university, such as Sir Thomas Lewis, who had made a great name in medicine.

LORD HARLECH, Pro-Chancellor of the University, said that the University was in fact a very small institution, but it was very proud that it had brought people from the wage-earning classes into touch with all the modern techniques of science and with the study of the humanities. It was a university democratic in origin and in structure and activity. The School of Medicine was itself the great result of local effort and interest. He went on to speak of the extraordinary advances in curative and especially in preventive medicine as he had observed them during his travels in Africa.

Sir CLEMENT PRICE THOMAS proposed the toast of the University College of South Wales and Monmouthshire and the Welsh National School of Medicine, and said how grateful he was, as a Monmouthshire man, that that sometimes forgotten county was included in the title. He spoke with pride of the medical school.

PRINCIPAL ANTHONY STEEL, replying for University College, remarked that it was in University College that medical training first began in Wales, and, together with the Cardiff hospitals, it was the parent of the Welsh National School of Medicine. Like many parents, it was astonished at its offspring—its vigour from birth, and the fact that it spoke with a strong Scottish accent!

PROVOST R. M. F. PICKEN, who also replied, condensed his speech, in view of the lateness of the hour, into one sentence in which he acknowledged the compliments paid to the Welsh National School of Medicine.

"The British Medical Association"

Sir ROBERT WEBBER proposed the toast of the British Medical Association, saying that he did so at the behest of his old friend, their excellent President. What he lacked in knowledge of the Association was made up by the sincerity of his admiration for the profession as a whole, which he looked upon as the greatest in the world. Doctors spent their lives halving the sorrows and doubling the joys of the sick, the lame, and the blind, and he knew that the British Medical Association had done great service in safeguarding the profession and enabling it to carry out its task in freedom. He had recently returned from Canada, where he had been interested to observe the tremendous pride which the medical men he met there felt in the British Medical Association and their own. Incidentally, he had found them very anxious to learn about the effect of the National Health Act in Great Britain upon the profession and upon the patient. Finally he spoke of his great delight in seeing Tudor Thomas in the Presidential Chair. His name was worthy to rank with other great names in contemporary Welsh medicine—names like those of the late Sir Thomas Lewis, Sir Horace Evans, Sir Daniel Davies, and Sir Clement Price Thomas.

The CHAIRMAN OF COUNCIL (Dr. E. A. Gregg), in responding, said that notwithstanding the late hour it would ill become him, speaking on behalf of the Association, if he did not say at any rate some of the things it was his duty to say on that occasion. This was a great event in the history of the British Medical Association; it was the jubilee of the foundation of the Association in the form in which it now existed. The first meeting under its present constitution was held in South Wales 50 years ago, and it was felt most appropriate that in 1953 they should meet again in the Principality.

This was a great occasion also because their friends in Wales had nominated as the President of the Association for this year their very good friend and councillor, Tudor Thomas, who had already done a great deal for the Association. Under his guidance they had had an excellent Annual Meeting, discussing many matters, and preparing a programme of work for the coming year which they would do their best to carry through. But, apart from that serious aspect of the meeting, the surrounding atmosphere and the social occasions which belonged to a meeting of that kind had been unusually happy. They had received a wealth of hospitality. The preparations which had been made for the visit had astonished him, and the warmth of the welcome had touched their hearts and was something they would never forget. They were going away with the happiest memories, and hoped to be able to come back again soon.

"The Guests"

Professor GILBERT I. STRACHAN proposed the health of the guests. The guests could be divided into various categories. The first consisted of those who came from overseas, whom they were very glad to welcome. Then there were a number of others associated with Cardiff and Glamorgan, to whose hospitality the success of the meeting was very largely due. There were the representatives of the City and the University who had provided such excellent accommodation and other facilities for the meeting. Another guest was the immediate Past-President, Dr. O'Farrell, who was to be congratulated on the way in which he had discharged his presidential duties during the past year. He associated two names with the toast, the Lord Lieutenant of the County, Major Traherne, who came of a family distinguished for a strong sense of public spirit, and had shown himself a man of outstanding ability in county affairs, and Dr. Wilder Penfield, O.M., who had been a Rhodes Scholar and had done great work at McGill University which had given him a world-wide reputation.

The LORD LIEUTENANT, in responding, said that Glamorgan had been glad to have this memorable meeting of the British Medical Association within its borders. This had been a great year for Cardiff, and one of the events to be remembered would be the visit of the Association.

Professor WILDER PENFIELD said that in acknowledging the toast he could speak for his Canadian colleagues. At this time there was perhaps a greater feeling of fellowship among the profession on both sides of the Atlantic than ever before. In Britain they had had a great occasion in the Coronation of the Queen, but perhaps it was not realized in this country how much this had meant to English-speaking people throughout the world. In saluting his British colleagues he thought he could speak also to some extent for the American Medical Association. The British Medical Association was regarded on the North American continent with respect and affection.

"The President"

The final toast was that of "The President," which was proposed by Mr. ROBERT D. OWEN, of Cardiff. He congratulated Mr. Tudor Thomas on accepting the responsibility of this great office and also on the way in which he had carried through the Annual Meeting. The name of Tudor Thomas was a worthy one to add to the list of Presidents over the last 120 years. He also paid a tribute to Mrs. Tudor Thomas. Tudor Thomas was a man greatly loved

by his colleagues, one who had never said an unkind word about his fellows, and as President he knew that he would maintain the dignity of the Association.

Mr. TUDOR THOMAS, who was loudly acclaimed on rising to respond, which he did just before midnight, thanked the company for the generous way in which this toast had been received and also thanked Mr. Owen for his kind reference to his wife. The British Medical Association was world-wide and stood for great ideals. Many great men in the profession had devoted themselves to its service. Some of them would spare an affectionate thought on this occasion for the distinguished Cardiff citizen who was President of the Association when it last met in South Wales in 1928—Sir Ewen Maclean.

The President went on to express his appreciation of the secretariat of the B.M.A. for all that they had done in the work of the Annual Meeting, and then mentioned some who had been prominent in the local arrangements, in particular Dr. J. D. Spillane, the Honorary Local General Secretary, and Mr. R. A. Mogg, his deputy, Professor G. I. Strachan, the Honorary Local Science Secretary, and Mr. A. S. Aldis, his deputy, also Mr. R. D. Owen himself for his work on the Local Arrangements Committee. Indeed, all the members of the various committees whose task it had been to look after the various parts of the meeting were to be thanked, not forgetting the ladies responsible for many of the social arrangements. Finally, for himself, he expressed his deep indebtedness to the civic and university authorities for their co-operation.

The dinner concluded with the singing of "Land of our Fathers."

CHRISTIAN MEDICAL FELLOWSHIP BREAKFAST

The annual breakfast of the Christian Medical Fellowship was held at the Continental Café, Cardiff, on July 15, with the President of the Association, Mr. J. W. TUDOR THOMAS, in the chair. In introducing the speaker to the large company, the President mentioned that the Rev. D. Martyn Lloyd-Jones was a member of the medical profession before becoming a minister. He had worked at St. Bartholomew's and in close association with Lord Horder. He was now the minister of Westminster Congregational Church.

Dr. MARTYN LLOYD-JONES said that he had pondered much on the subject to choose for his address. Should it be about faith-healing or the relationship of the Church and medicine? Finally he had decided to be governed by a medical dictum, and give the "patient" what he thought was the best thing for him, taking as his theme the doctor's personal approach to life and to death. Those in the medical profession had certain peculiar temptations, perhaps the most serious being a proneness to objectify everything and take a detached view. In a way this was inevitable, because a doctor obviously could not allow himself to be affected emotionally by every case he treated. He had to put up a protective barrier against the troubles and the suffering of others, and especially perhaps against the fact of death. The danger lay in this objectiveness becoming a fixed habit, so that he might fall into the terrible error of never really facing himself and his life at all. The speaker adapted an epitaph of which he had heard—"Born a man, died a doctor."

For this complaint he had no need to prescribe for the patient. The prescription was ready to hand in the Bible. All that he, as a minister, had to do was to dispense it. He proceeded to read the story from St. Luke of the man who had laid up for himself riches on earth and when the time came to take his ease and enjoy himself death came to him, for which he had made no provision at all. Dr. Lloyd-Jones said he had no intention of speaking about riches. He read the newspapers and was therefore familiar with the fact that during the last five years doctors had become semi-paupers. What he was interested in was the kind of man this was in the story. He was a man who had prided

himself on his hard-headedness, his worldly wisdom; he was a wise man who looked ahead, particularly proud of his foresight and carefulness, one who took an objective view of everything. And Christ had said that this man was a fool. He had failed at the very point where he had always thought himself strong; he had looked ahead and catered for every eventuality except one—he had not catered for the thought of death.

It was a fact that in this world we very often failed to see the thing that was most clearly before us. One might say that doctors were not interested in death, but in life and health. That was true, but was there anything that tended to affect life more than death? The fear of death and the thought of death was one of the most potent factors affecting our health and our well-being from day to day. It was indefensible to refuse to face up to it.

The man in the story was a fool because he had thought of himself in terms of possessions and success. This was an insult to his being and to his Creator, in whose image he was made. Man was more than a reasoning animal, he was destined for communion with God. This man had refused to face the fact that he would come face to face with God and justify himself. What had he done with the gifts God had given him? All gifts came from God and must be used as God intended. The only way by which a man could face the meeting with God was through belief that in Christ he had been offered forgiveness for all his wrongdoing.

Again, the man was a fool because he was a poor judge of riches. True riches consisted in peace of conscience, not in the measure of possessions gathered in this world, and were to be found in the Gospel of Christ—the knowledge that death is not the end of life but the beginning of eternal life.

Dr. Lloyd-Jones concluded: "I suggest to you that these are the things which the doctor needs to think of. You are gathered together to think of the patient and his needs and his diseases and the cures and the problems. It has been my humble privilege to say these few words, to beseech you, as a one-time medical man who still loves the profession and every man and woman who belongs to it, not to allow the profession to make you forget yourself. You are a man, and not merely a medical man. Face yourself and what is inevitably true about you, as it is true about every other human being."

The PRESIDENT, in thanking Dr. Lloyd-Jones for his inspiring words, said that his rhetoric and delivery had kept the rapt attention of everyone, and all must have been struck, as he had been, by the obvious sincerity in every word he had spoken.

CIVIC RECEPTION

The City Hall, Cardiff, which for several days had resounded to medico-political discussion, transformed itself into an arena of gaiety on July 15, when a civic reception and dance was attended by a company of about 1,000. The guests were received by the Lord Mayor (Sir James Collins) and the Lady Mayoress and by the President of the Association (Mr. J. W. Tudor Thomas) and Mrs. Tudor Thomas.

Many of those attending were in academic robes. Among those present were the Chairman of Council and Miss Gregg, Dr. and Mrs. P. T. O'Farrell, the Archbishop of Wales (Most Rev. Dr. John Morgan), Sir Russell Brain (President of the Royal College of Physicians) and Lady Brain, Professor W. J. O'Donovan, of Cork, President of the Irish Medical Association, Sir Frederick Rees, former Principal of University College, Dr. R. M. F. Picken, Provost of the School of Medicine, and Dr. David G. Morgan, medical superintendent of Llandough Hospital.

During supper in the Lord Mayor's parlour a representative from Hawaii, Dr. W. B. Quisenberry, director of the Bureau of Hygiene, assisted by his wife, performed the picturesque ceremony of Hawaiian welcome and farewell. Dr. Quisenberry garlanded the ladies of the company and

his wife the gentlemen, the garlanding being accompanied by the customary kiss and the Hawaiian salutation, "Aloha."

Dancing continued until a late (or early) hour, and for the more serious-minded the civic treasures of Cardiff were on display. The flood-lighting of the City Hall and the adjacent buildings in Cathays Park, and the wealth of flowers and Coronation decorations made a brilliant spectacle for the visitors and for the crowd who watched their arrival.

POPULAR LECTURE

SIR RUSSELL BRAIN ON DR. JOHNSON

The Popular Lecture which concluded the proceedings of the Annual Meeting at Cardiff was given on July 17 by Sir RUSSELL BRAIN, P.R.C.P., whose subject was "Dr. Johnson as Scientist and Patient." The chair was taken by Mr. Tudor Thomas, the President, supported by the Lord Mayor of Cardiff and by the Chairman of Council and the Chairman of the Representative Body. The Reardon Smith theatre was well filled.

Johnson and Science

Dr. Johnson, said the lecturer, was famous, not so much because of his literary achievements as because of his personality, particularly as revealed by Boswell. But Boswell did not invent Johnson, he only reported him, and some of the less familiar aspects of Johnson were revealed from other sources and showed a mind wider in scope and richer in interest than the Johnson of Boswell. Boswell, for example, never suggested that Johnson knew anything of science, and yet from casual observations it was evident that Johnson had an eager interest in and some acquaintance with the scientific and philosophical discussions of the eighteenth century. The best account of Johnson's interest in chemistry was given by Hawkins. At Streatham, apparently, Johnson contrived some chemical experiments until these were banned by Mrs. Thrale. At the close of his life he interested himself in and gave learned descriptions of the principle of the air-bladder or balloon, which was then evoking much public interest. He evidently had a grasp of both chemistry and physics. His limitless curiosity found scope also in natural history. He measured the rate of growth of his nails and hair. He was concerned about the disappearance of swallows in winter. He was vastly interested in the kangaroo, first described by Captain Cook in 1773, the year of Johnson's tour of the Highlands, and there was a humorous account of Johnson's imitating the shape and motion of the kangaroo, gathering up the tails of his big coat and making vigorous bounds about the room. One of the specimens taken by Captain Cook's party was given by Sir Joseph Banks to the Royal College of Surgeons, and it was only a few years ago that bomb damage at the College brought about the end of Johnson's kangaroo. Johnson seemed to have been in touch with physiological research; in the *Idler* he revealed himself as an antivivisectionist, and he also entered into evolutionary controversies concerning the orang-outang and the human tail which in some way anticipated Darwin. Sir Russell Brain quoted an instance in which Johnson revealed himself as an "unqualified practitioner," prescribing for a lady, of whose complaint he had been told by her physician, a remedy which consisted of taking one ounce of dried orange peel, finely powdered, and divided into scruples, each scruple being drunk in a glass of red port—a medicine, he said, which was not disgusting.

Johnson's Infirmities

In early life Johnson received the "royal touch" from Queen Anne, and he was a sufferer from many infirmities, but he had a strong constitution which enabled him to survive to the age of 75. During the last ten years of his life he suffered increasingly from shortness of breath and cardiovascular incompetence. He took opium, two or three grains a night, for his dyspnoea. Sir Russell Brain showed

portraits of the doctors who attended Johnson in his later years—in particular Richard Brocklesby, Dr. Warren, Dr. Heberden, and Mr. Cruickshank, the surgeon.

The singular appearance and nervous habits of Johnson had often been remarked. He appeared to be in a state of constant agitation. Miss Reynolds, sister of Sir Joshua, described his extraordinary gestures, such as stretching out his arm in any direction with a full cup of tea in his hand, to the peril of the clothing of his neighbours, also the continual movement of his head, hands, and feet, all in motion at the same time. Some people thought it was a nervous disorder, but had that been so he could not have controlled the movement when he wished, and this he certainly could do. Boswell suggested some form of St. Vitus's dance, but Sir Joshua Reynolds declared that it came from habit in which he indulged by accompanying his thought with some form of physical action, and Sir Russell Brain believed that Reynolds and not Boswell was right. A Miss Hunter once, with great temerity, asked Johnson why he made such strange gestures, and his answer was, "From bad habit."

Johnson was afraid of death and afraid of many things. He had a consciousness of guilt and sin, and periodical attacks of severe depression. It seemed ironical that a man of such disordered mind should have come to be regarded as the embodiment of British common sense. But his mind must have been of exceptional quality. Was his mental gloom or disorder a handicap or was it the necessary accompaniment, so to speak, of so virile an intelligence, a memory so remarkable, a habit of thought capable of such richness of association and verbal discrimination as made him the author of so famous a dictionary? Madness was common, genius was rare, and Johnson with all his infirmities was a genius who had achieved greatness and immortality and was secure in the affection of mankind.

On the motion of Dr. E. A. GREGG, Chairman of Council, a resolution of thanks was accorded by acclamation to the lecturer.

OFFICIAL RELIGIOUS SERVICE

The official religious service in connexion with the Annual Meeting was held at St. John's Church, Cardiff, on July 14. Members assembled and robed at the City Hall and walked in procession to the church. The service, conducted by the vicar, Canon T. M. Hughes, included thanksgiving for the advance of medical science and prayers for the medical profession and the hospitals and nursing services. The First and Second Lessons were read by the Chairman of Council and the President respectively.

The preacher was the Archbishop of Wales (Most Rev. John Morgan, D.D.). After a reference to St. Luke, the beloved physician, he went on to describe the ideal doctor, adding that he could not suppose he would be as successful as Chaucer in depicting the ideal parson:

"... Cristes lore, and his apostles twelve,
He taughte, but first he followed it himselfe"

—but it was a task worth attempting. In the first place, the doctor must have a sense of vocation. This needed explaining because the word "vocation" had become precious; it was usually restricted to the ministry, and it had come to be regarded as something rare and strange, possibly visionary. But "vocation" was exactly what the word meant—a calling by God, a kind of request that each man or woman will do some particular work. The call, of course, might come in some dramatic way, but ordinary people were usually called to their work in some ordinary way, and the mistake must never be made of assuming that the extraordinary was necessarily more valuable than the ordinary. For each of them, happiness in his work came largely through the belief that he had been called upon to do it. No doubt a doctor could carry on his task without vocation. He might do so for a variety of reasons, some of them good, and others indifferent. But if a doctor had had no sense of vocation there would be a sense of frustration and disappointment.

He would be called upon to undertake monotonous and depressing tasks, to see people under conditions which emphasized their failings rather than their good qualities, and if he was not fortified by the sense of vocation he would be tempted to ask himself, "Is it all worth while?" A man could rise above this only if he knew that he was not only doing good work but work to which God had called him. A real sense of vocation was a great protection. It was easy to see the harm that could be done by the exercise of mere competence without this higher calling. There were teachers who were able to impart knowledge to their pupils without giving them a love of knowledge. There were priests who could be silver-tongued in the pulpit and yet had no love for souls.

In the world as it was at present there was probably a greater amount of philanthropy and care for the unfortunate than ever before in history, but whether that state of things was likely to continue with the decay of Christian belief was very doubtful. The Christian faith began with one commandment—"Thou shalt love the Lord thy God and thou shalt love thy neighbour as thyself." Christ was the first person who had put together these two sentences from the Law of Moses. Through the centuries the two things had sometimes become divided again; it was rather like a candidate faced with an examination paper which bore the note, "Attempt either." Man could take his choice, either serve God or serve his fellow-man. And the next step would be inevitable. We saw around us many examples of kindness and good nature, but we might not be far from the truth if we regarded them as remnants of the more Christian past. They were rather like the brightness that lingered in the sky after the sun had set. The goodness to be seen in this country was not a rock on which we could build a brave new world; it was rather a legacy from the past, because you could say "I believe in man" only after you had said "I believe in God."

The ideal doctor must also have imagination; but what was meant by imagination? To quote a dictionary definition: imagination was a mental faculty for forming images of external subjects not present to the senses; a creative faculty of the mind. Having imagination did not really mean seeing things that were not true, it was rather a gift of seeing things from the point of view of someone else, of getting outside oneself and taking the larger view. It was often more than this, he knew, but he thought he had said enough.

In conclusion the Archbishop said that he had made no reference to professional training, nor had he touched upon the necessity for a high standard of morality, and these omissions had been deliberate. By making such omissions he was paying the profession the greatest possible compliment. "When one is ill and sends for the doctor it is taken for granted that he will be both competent and honourable, and this assumption springs from the experience, not just of one person, but of thousands over many years. Is not the fact that this is taken for granted the highest praise that society can give you in your great profession?"

ROMAN CATHOLIC SERVICE

Holy Mass was celebrated at St. Peter's Church, Cardiff, on the morning of July 14. Roman Catholic members attending the Annual Meeting assembled and robed at the Mansion House, where a reception was held after the service.

The celebrant was His Grace the Archbishop of Cardiff (Most Rev. Michael McGrath), and the sermon was preached by the Rev. Barrett J. Davies, B.D. In his sermon Father Davies devoted himself to the theme that the use of created things must not frustrate the purpose for which they were created. To the agnostic, he said, things might be used for any purpose for which they could be used. This led to the complete exploitation of Nature. In the modern sphere agnosticism produced humanism, a rejection of God as the last end of the universe, and the substitution of human convenience as its final purpose.

"As doctors you are in the forefront of this conflict between humanism and Christianity. The campaign for euthanasia, contraception, and so forth is increasing, and the agnostic cannot understand our objection to these evils because he sees no final purpose in human life or its functions. There is no common ground on which he is prepared to meet us, precisely because he has been brought up in this modern heresy. To those who reject the revelation the existence of a Creator and the knowledge of the final purposes of the universe must remain unknown."

"If we can do nothing as individuals to bridge this unfortunate gulf between agnosticism and Christianity we can at least safeguard our own position. We can change belief into conviction. We must make it clear to ourselves as well as to others that we reject these evils not because they are forbidden by the Church but because they are intrinsically wrong; they violate the divine order of the universe. The half-hearted Catholic accepts the Church's ruling on these matters reluctantly. He is torn between his loyalty to the Church and his desire to conform to the pattern of this world. This will not carry conviction to others. The agnostic will respect true conviction whenever he finds it. He will not ask his Christian colleague to do anything which violates his conscience if he feels that that conscience is formed, not by the prohibition of any external authority, but by a deep inner conviction. Such conviction comes only from a fully integrated personality."

The death of Christ, said the preacher in conclusion, was a consecration of the whole human race to God, reconciling us and restoring the final purpose for which we were created. "On the Cross Christ offered Himself once for all; in the Mass I fulfil my part in that sacrifice, I offer the divine Victim for myself. He has already made Himself my Victim by dying for me. I also make Him my Victim by my co-operation. I declare that He truly represents me. I offer myself to God in union with Him. We may say that it is Christ who is sacrificed in the Mass, but it is ourselves that we offer."

OPENING OF EXHIBITIONS

The exhibition of medical and surgical appliances, drugs, foods, and books, and the scientific exhibition, both of which were housed in Sophia Gardens Pavilion, Cardiff, were opened by the President of the Association, Mr. J. W. Tudor Thomas, on Monday morning, July 13. In the trade exhibition 64 exhibitors had stands.

The President, who was supported by the President-elect and the principal officers, said that they were very fortunate in Cardiff in having a large hall in which both exhibitions could be accommodated. The scientific exhibition was in the centre, and the trade stands grouped around.

The nature of the trade exhibition was set out in the official catalogue. The firms exhibiting were of the highest standing, and, indeed, firms which were known all over the world. The quality of the goods displayed, from a minute thing like a hypodermic needle to a complicated piece of apparatus, was of the highest. They were carefully packed and attractively displayed, and everyone would find the greatest interest in looking round at what was on view on the stands. He thought he could say that the firms were out to please medical men, who were not always easy to please, but, in endeavouring to please them, what they were really trying to do was to produce something which was best for their patients. He expressed gratitude to the exhibitors, who had taken great pains and trouble in putting before them everything they needed. He hoped the exhibitors would derive some measure of benefit from the trade which would naturally and properly result from their efforts.

In the centre was the Scientific Exhibition. Here there were 32 stands representing a great deal of carefully prepared work—research work—the result of much thought and planning. He knew, personally, in the case of some of the exhibits how much care and thought had been put into their planning. Here one could see the results of a great deal of modern thought in medicine, surgery, and pathology. The wide range of subjects covered by the exhibition was outlined in the Handbook of the Meeting. He expressed gratitude to the individual doctors and institutions whose medical departments had gone to so much

trouble to put these things together in a very attractive form in the exhibitions, and he declared both exhibitions open.

The Representative Meeting was put back for a short time in order to permit of representatives making a tour of the exhibitions.

THE TRADE EXHIBITION

Seldom at an Annual Meeting has the exhibition of surgical instruments and appliances, drugs, foods, books, and other equipment of interest or necessity in medical practice been so pleasantly housed as at Cardiff. The Sophia Gardens Pavilion is built for utility, but its architectural plan is pleasing, and it comfortably accommodated the stands of the trade exhibitors, and also, in an enclosed centre, the scientific exhibition, to which various schools, public health departments, laboratory services, and research institutes had contributed. At the end of the hall, on a dais, was the registration counter for members and a display by the British Medical Association of the many journals which it now publishes. The exhibition had a uniform scheme of general decoration, leaving plenty of scope for individual arrangement. As space is insufficient to give a description of each stand, and to mention some exhibitors and not others would be invidious, only a visitor's impression can be given.

Antibiotics and Hormones

Almost half the stands were devoted to the products of the laboratory in the form of drugs, pharmaceutical preparations, and dietetic foods. Here were to be seen the whole range of antibiotics, hormone products, antiseptics, vaccines and prophylactics, and so on. One of the stands was almost wholly given up to terramycin. Combinations were much in evidence, such as an oral preparation of streptomycin combined with sulphaguanidine, or tablets containing penicillin and a sulphonamide. A.C.T.H. freeze-dried for rapid solubility was exhibited. One firm concentrated on glucose in various forms, included a glucose barley-sugar base into which halibut oil was incorporated. Among the anaesthetics was one product which it was claimed would maintain local analgesia for a week or longer after a single injection.

Appliances and Equipment

The appliances and equipment section revealed again the ingenuity which goes to the making of instruments. Here were anaesthetic apparatus in new patterns, operation tables, and stainless steel instruments. Nylon was in evidence as a material for unbreakable hypodermic needles. Attention was drawn to a monocular ear-microscope, a portable instrument developed by the otological unit of the Medical Research Council. At one stand an appliance was shown designed for the purpose of promoting breast-feeding. This device, for initiating and maintaining lactation, takes "feeds" from the breasts exactly as if it were a real baby; indeed, it does better, for the "feeds" can be taken from both breasts at once. The visitor was faced with a bewildering variety of plasters, dressings, and the like, including a new form of tubular gauze bandage. At least four stands had an elaborate display of ophthalmic instruments. An intraocular acrylic lens was in evidence. Devices to ease the doctor's burden included a new form of dictating unit and a mobile radiotelephone.

Auxiliary Services

The Board of Registration of Medical Auxiliaries exhibited the current registers of its six sections and much other literature concerning the various branches of medical auxiliary work, and at an adjoining stand the N.O.T.B. (Medical Eye Section) offered particulars of its services to a membership which is open to ophthalmic medical practitioners and dispensing opticians. The Medical Insurance Agency was there to offer expert advice on all insurance matters, and the London Association for Hospital Services explained its plan for providing for the expense of private ward or recognized nursing-home treatment. Finally there were seven book-

stands which tempted one to linger, and evoked the reflection that here in the world of medical publishing was an elegance which matched that shown elsewhere in the Exhibition by the pharmacists and the instrument designers. Altogether the exhibitors are to be congratulated on a fine piece of work and perhaps commiserated with on the fact that the fullness of the programme of the Annual Meeting allowed members only a limited time for inspection.

HEARD IN CATHAYS PARK

Badges for All

The most unobservant citizen of Cardiff could not have helped noticing that something of unusual interest was taking place in his city, for every second person was badged. Sixteen different sorts of badges were worn on the various lapels, from the dark red of the local committee men, the dark blue of the members of Council and Headquarters staff, the dark green of officers of the scientific sections, to the light red of the Press, and the cream of the ladies. The streets themselves were badged, having been admirably sign-posted by the Automobile Association in collaboration with the chief constable. Then, again, academic robes were worn on six distinct occasions in Annual Meeting week, and academic robes give both colour and dignity to any setting. Even in a year of pageantry the church procession from the City Hall to St. John's and from the Mansion House to St. Peter's was grateful to the eye.

Official Receptions

After the President's reception in the National Museum of Wales on July 13 (see p. 57) it was the University's turn the following night. Joint hosts were the University College of South Wales and Monmouthshire and the Welsh National School of Medicine. The guests were received by Principal Anthony Steel and Mrs. Steel on behalf of the University and by Dr. R. M. F. Picken, Provost of the Welsh National School of Medicine, and Mrs. Picken. This was a colourful occasion, for as a background to the academic robes of the men and the evening dresses of the women there were flowers in profusion.

In fact, the floral decorations everywhere were a feature of the meeting: even the table on the platform at the Plenary Sessions was graced with an armful of roses. On July 15 there was a Civic Reception and Dance at the City Hall. The Lord Mayor of Cardiff, Sir James Collins, and Lady Collins welcomed the guests.

Parties and Dances

The scale of the Cardiff hospitality was set at the beginning of the meeting by the sherry party given by the Cardiff Division (Chairman, Professor A. G. Watkins) on July 8. About 1,000 people were present. A few days later, on July 14, the Monmouthshire Division (Chairman, Dr. B. A. Thomas) gave a sherry party at St. Mellon's County Club. Here again a very large number of guests greatly enjoyed themselves in the pleasant surroundings of this well-known club, which most generously offered honorary membership to members of the B.M.A. attending the meeting.

One of the functions held in the newly opened B.M.A. House in Cardiff was a sherry party for women representatives given by the South Wales Association of the Medical Women's Federation. This was on July 10.

Of the two large garden parties held during the meeting, the first was on July 16 at Margam, by invitation of Mr. and Mrs. Evans Bevan.

Strangers to Glamorgan usually underestimate the beauty and interest of the county. A pleasant surprise was in store for the many members of the Association and their ladies who accepted the generous invitation of Mr. and Mrs. Evans Bevan. Fortunately the weather remained fine and guests were able to enjoy the fine setting of Margam Abbey and the

Castle. After being received by their host and hostess, guests climbed a beautiful slope bordered by trees and crowned by the Castle, about 120 years old and unfortunately unoccupied. The view of the Bristol Channel from the Castle terrace was admired, and guests then descended to the oldest Orangery in Europe for a generous and perfectly organized tea, ended by one of the briefest and most agreeable speeches of the Annual Meeting (the speaker was the President, Mr. Tudor Thomas). The very fine Abbey, dating from 1147 and still filled with worshippers every Sunday, was visited after tea as well as the ruins of the adjacent Chapter House of the monastery, which once had 2,000 monks attached. As the garden party ended, a sudden shower drove the visitors to their cars and buses—and so back to the preparations for the Annual Dinner.

On the next day, July 17, the Board of Governors of the United Cardiff Hospitals gave a garden party at Duffryn House, where the guests were received by Mr. Gilbert D. Shepherd, chairman of the Board of Governors of the United Cardiff Hospitals, and Mrs. Shepherd. Among other notable occasions was a complimentary luncheon in honour of the President, Mr. J. W. Tudor Thomas, given by Sir Robert Webber, managing director of the *Western Mail*.

For those fond of dancing there was no lack of opportunity: the Representatives' Dance on July 8; a dinner-dance at St. Mellon's County Club on July 10; a dinner-dance at Porthcawl on July 11; a dance after the Civic Reception on July 15; a dinner-dance at St. Mellon's on July 18; and finally the B.M.A. Summer Ball in aid of the Ladies' Royal Medical Benevolent Guild at Cardiff Castle on July 17.

Excursions

Thanks to the efforts of the Entertainments and Excursions Committees many interesting excursions were arranged both for members and for their wives. On Sunday, July 12, there was an all-day excursion to St. Donat's Castle. One of the first to encourage others to try the swimming-pool by sampling it himself was the chairman of the Representative Body. Later in the evening Representatives had the opportunity of listening to Welsh choral singing at a concert in the New Theatre.

South Wales at Work

One greatly admired those members who, declining such events as garden parties and other pleasant outings, and remaining aloof from golf courses and tennis lawns, betook themselves to one or other of the three great steelworks of South Wales which opened their gates to the Association. Some of them conscientiously went through the pattern shops, the blooming mills, and the tin-plate plant, and got as near they could to the blast furnaces, or accepted the National Coal Board's invitation to go down the most modern colliery in the country, the name of which—Nantgarw—few ventured to pronounce, and to visit the coke ovens and by-product plant there, which is said to be the finest in the world.

The Annual Dinner

Wonderful as was the setting for the Annual Dinner under the barrel roof of the City Hall—as fine a hall as there is in this country—the visitor on looking at the toast list, with six separate toasts and fourteen speeches, felt his stomach sink. As it happened, in spite of the amplifying equipment, some of the speeches were heard only with difficulty. The speaking began at 10.15 p.m. and ended a couple of hours later. The dinner this year was not so well attended as it should have been, and two hours of after-dinner speaking is likely to discourage members and their wives from being present at such an important function.

The Ladies

The smoothness and efficiency of the arrangements made for the entertainment of the lady visitors to Cardiff testified to the great efforts which must have been put in to all the

organizational work by the various ladies' committees, especially the executive committee of which Mrs. J. W. Tudor Thomas was the chairman and Mrs. J. D. Spillane the secretary.

The Ladies' Club in the university, at which about 350 ladies registered, was a haven of rest and refreshment, and from it the ladies were escorted, as their fancy took them, to mannequin parades at St. Mellon's County Club, to tea parties at country houses, or to places of historic interest, such as Caerphilly Castle and Caerleon. The Ladies' Dinner on July 9 was a gay and friendly affair.

Golf

The golf competition for ladies was played on the Barry Links on July 15, the Notts Ladies' Challenge Cup being won by Mrs. Jack Matthews, of Cardiff. The competition for the Treasurer's Cup was played on the Royal Porthcawl Links on July 16. The winner was Mr. L. P. Thomas, F.R.C.S., of Cardiff, with a net score of 77. The Leinster and Childe Cups were played for on the Southerndown Links on July 19, the winner of the former being Dr. J. L. Jones, of Bridgend, who was two down on bogey, and of the latter being Dr. W. J. Lewis, of Maesteg, Glam., also two down on bogey.

PUBLIC HEALTH

REMUNERATION OF ASSISTANT MEDICAL OFFICERS OR MEDICAL OFFICERS IN DEPARTMENTS

The following circular (M.D.C. Circular No. 17, dated July 9, 1953) has been issued to all local authorities in England, Wales, and Scotland, by the joint secretaries of Committee "C" of the Medical Whitley Council.

1. As negotiations upon revised salary scales for assistant medical officers or medical officers in departments failed to result in agreement the matter was referred by the two Sides of Committee "C" to the Industrial Court for determination in accordance with the provisions of the Industrial Courts Act, 1919. After hearing the parties, the Court made the following award:

(a) The salary scale of assistant medical officers or medical officers in departments shall be £950 by £50 to £1,300.

(b) Paragraph 13(c) of Award No. 2321 shall apply as before, the scale for assistant medical officers being adjusted to £950 by £50 to £1,300.

(c) The new scale shall be applied to the present holders of such appointments, assimilation being at the point on the new scale corresponding with the medical officer's position on the old scale. A medical officer now at the maximum (£1,150) of the old scale shall be placed at the sixth point (£1,250) of the new scale and shall thereafter proceed to the new maximum (£1,300).

(d) The operation of the new scale shall not in any circumstances result in reducing the salary of any medical officer in post.

Effect shall be given to this award as from June 1, 1953.

2. This award (No. 2452) has been considered by Committee "C" of the Medical Whitley Council. The Committee has accepted the award and recommends all local authorities to put it into operation.

3. Printed copies of the Industrial Court Award No. 2452 may be obtained from H.M. Stationery Office.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

Correspondence

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

Cost of Prescribing

SIR,—I address you both as a physician and as a taxpayer. Digitalis folia and digoxin have similar effects on the heart except for that of speed of action. Digoxin in full doses by mouth has a good pharmacological action within a few hours, and by intravenous injection it acts more quickly still. Digitalis folia in full doses is not fully effective within two to three days. Thus in acutely ill patients there is no question as to which drug should be used. But for ordinary maintenance therapy there is nothing to choose between the two.

From a large experience I know that many doctors, perhaps a majority, prescribe digoxin as a maintenance drug, either because they mistakenly think that it constitutes more scientific therapy, or, as I rather suspect, because of laziness. Digoxin is one word and digitalis folia is two.

As a taxpayer addressing taxpayers I would like to remind them that the retail price of 100 tablets of digitalis folia 1 gr. (65 mg.) is 1s. 8d., and of 100 tablets of digoxin, 0.25 mg., is 4s. 2d.; and that the equivalent special wholesale price to hospitals is 2s. 6d. for 1,000 tablets of digitalis folia and 24s. 7d. for 1,000 tablets of 0.25 mg. digoxin. I suggest that it is to their financial advantage to write two words instead of one.—I am, etc.,

London, N.W.1.

GEOFFREY BOURNE.

SIR,—It looks as if we are being rushed once more over the question of prescribing, with special emphasis on proprietary preparations, the reason given being the cost of them *vis à vis* the *National Formulary*. I hope long and deep consideration will be given to this, as there are very grave implications involved. We are astonished at the cost mainly because the cost of the whole service was based on valueless statistics worked out by experts for a totalitarian service.

The cost of prescriptions seems excessive, and if it really is excessive—I am not admitting that it is—the blame must be shared equally by the Government, the patient, and the doctor—the Government because of shocking under-estimating, the patient because of excessive demands on the doctor, and the doctor for satisfying the excessive demands of his patient, who was assured that he could have anything and everything for curing or alleviating his ill-health; and here let me suggest very forcibly that the patient must have a considerable say as to whether his demands are excessive—or hasn't he?

The question of proprietary preparations being expensive has of course many facets. A firm may spend thousands on research and clinical tests, etc., and this will have to form part of the cost. Another firm may just copy the formula and manufacture it—without any research—at a much lower cost.

We should not accept too readily the statement that the drug bill of £40m. for 50 million people is excessive, considering the price of such things as cotton-wool, bandages, lint, and the antibiotics, etc. If we accept too readily and too easily that we are prescribing too expensively we may be putting back curative medicine many years, for, after all, we are the part of the research department of health which is best placed to test the therapeutic value of any preparation. It should be up to the Government to tell the manufacturers to reduce their prices. We seem to be moving towards the dictation of a group of Government experts on what we must and must not prescribe.—I am, etc.,

St. Osyth.

R. E. CLARKE.

Demands of Whole-time Specialists

SIR,—The cause of the whole-time specialist is dear to many of us. It is much to be regretted that at this late date there is still confusion as to the relative importance of many of the points at issue. All of the points expressed by Dr. Leo Gilchrist (*Supplement*, June 27, p. 314) are relatively insignificant in comparison with the importance of implementation of the Spens recommendations. Let us not ignore the wood for the trees.

Until recently the claim for income-tax reliefs could without distortion be interpreted as an attempt to obtain preferential treatment, however justified, over and above every other class of wage and salary earner, professional and otherwise, throughout the country. The present claim for consideration is now only properly based on the judgment of Mr. Justice Gerrard in the case of *Crawford v. Charing Cross Hospital* (*Journal*, May 2, p. 1001). Dr. Michael Ashby in his letter (*Journal*, May 9, p. 1051) quotes from the judgment as follows: "Nice questions might arise as to how far a medical man could excuse his ignorance of a technical development that he had not met in his reading of his professional journals." "It was the anaesthetist's duty to follow up the writings on a subject which concerned him closely." "I think it was regrettable slackness that left Dr. X in ignorance of the opinions of distinguished men on an important subject so closely affecting his own work at the time he came to administer the drip to the plaintiff." Of course some of us feel strongly about these many points, but first things must come first, and at present the first thing must be Spens.

But for Dr. Gilchrist to state that the Government is "paying him less than one-tenth of the cost of using it (his car) on official business" is a greater disservice to the cause of the whole-timer than even its worst enemy could concoct. We are not asking for the travelling allowances to cover the wages of the chauffeur and the gardener who keeps the drive weeded. Informed opinions seem to agree that one-half is probably nearer the figure. The Staff Side of Whitley "B" has an almost unendurable task as it is. But for them to be harassed by wild fantasies of this sort makes it just about impossible.—I am, etc.,

Worcester.

ANTHONY A. VICKERS.

Association Notices

Diary of Central Meetings

- JULY
- 23 Thurs. G.M.S. Committee, 10.30 a.m.
27 Mon. Staff Side, General Whitley Council, 10.30 a.m.
(at 14, Russell Square, London, W.C.)
27 Mon. Full General Whitley Council, 2.30 p.m. (at 14, Russell Square, London, W.C.)
29 Wed. Executive Subcommittee, Joint Formulary Committee, 2 p.m.
29 Wed. War Memorial Committee, 2 p.m.
30 Thurs. Central Consultants and Specialists Executive, 12 noon.
30 Thurs. Central Consultants and Specialists Committee, 2 p.m.

Branch and Division Meetings to be Held

WEMBLEY DIVISION.—At Wembley Hospital, Fairview Avenue, High Road, Tuesday, July 28, 9 p.m., meeting. Report on Annual Representative Meeting, speaker Dr. McConnell Thomson.

Meetings of Branches and Divisions

COUNTY ARMAGH DIVISION

The annual meeting was held in Armagh on June 23, 1953. Dr. F. M. J. McFerran was in the chair. The following officers were elected:

Chairman.—Dr. H. A. McCaffrey.
Vice-chairman.—Dr. T. A. Spence.
Hon. Secretary and Treasurer.—Dr. D. L. Hemmingway.

WESTMINSTER AND HOLBORN DIVISION

At the annual general meeting the following office bearers were elected for the session 1953-4:

Chairman.—Dr. J. L. McCallum.
Vice-chairman.—Dr. Alice E. N. Gilby.
Secretary and Treasurer.—Dr. Arthur A. Bradley.

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The B.M.A. in Committee

OCCUPATIONAL HEALTH

Occupational health is by no means a new concept, and the subject, in one form or another, has had the attention of the British Medical Association all through its history. To come to quite recent times, in 1941 the Association set up a Committee on Industrial Health in Factories, which made a useful report, influenced, of course, by the special war conditions then prevailing. The formation of a special committee devoted to this subject as one of the standing committees of the Association dates back only for a few years. Formerly questions affecting practitioners engaged wholly or partly in industrial medical service were dealt with by a subcommittee of the General Practice Committee (which, with the coming of the National Health Service, bequeathed its functions in part to the General Medical Services Committee and in part to the Private Practice Committee).

Outside Nominations

The constitution of the Occupational Health Committee is unusual in that as many as seven of its twenty members serve on the nomination of bodies outside the British Medical Association. It is true that the Public Health Committee has two members nominated by the Society of Medical Officers of Health, and the General Medical Services Committee includes nominees from the Medical Practitioners Union and the Medical Women's Federation; but the Occupational Health Committee has seven members from outside—three of them nominated by the Association of Certifying Factory Surgeons (the term "Certifying Factory Surgeon" is now replaced by "Appointed Factory Doctor"), and four by the Association of Industrial Medical Officers, a body which represents those engaged both whole-time and part-time in industrial medical services.

This representation brings a valuable addition to the experience available to the Committee, but it has also led at times to some conflict of points of view. From a long experience of the committees of the Association the present writer would say that the Occupational Health Committee is a difficult committee to steer. Its admirable chairman, Dr. J. A. L. Vaughan Jones, of Leeds, who has piloted it from the beginning, has been able to bring different points of view into an area of agreement.

Apart from the members nominated by the two bodies just mentioned, there are four elected by the Council of the Association and four by the Representative Body, and one appointed by each of the four Association committees whose territory is contiguous to or overlapping that of industrial health—namely, General Medical Services, Central Consultants and Specialists, Private Practice, and Public Health.

As industrial dermatitis has been a subject much before the Committee there is also one member nominated by the Dermatologists Group Committee.

An Uneven Field

The Committee has a difficult task to discharge. The industrial medical service is not a compact uniform organization like, for example, the medical services in the defence Forces. Great Britain is a country of small factories. Out of more than a quarter of a million of them, only some 20,000 employ more than 20 people. Few industrial establishments are of a size to justify a whole-time medical officer of their own, and even among the larger establishments relatively few have definite arrangements for medical services, apart from some provision for first-aid and perhaps the appointment of a nurse. Many working communities are not within the scope of the Factories Acts of 1937 and 1948, and only about 350 inspectors are available for visiting the 280,000 work-places covered by the Act. A survey conducted in 1949 by the Ministry of Labour and National Service showed that the number of doctors with whom arrangements had been made for factory medical services in Great Britain was just over 3,000, and only 235 occupied whole-time appointments, though another 200 were giving a substantial amount of their time to factory work.

In spite of obvious difficulties the Committee has achieved a very large amount of excellent work. A report from the Council was approved by the Representative Body in 1949 recommending the establishment of a comprehensive occupational health service of a national character, integrated with the National Health Service, and planned and supervised by the Ministry of Health, after preliminary surveys to ascertain the special needs of different areas. Definitions and general principles were set out, and the problems envisaged by this report have since been under study in greater detail by the Occupational Health Committee.

Status of Industrial Medical Service

The Committee has laid down scales of salaries and increments for industrial medical officers. It has drawn up a concise statement of duties and ethical rules for the guidance of practitioners engaged in this service. Its latest task has been the production, after long travail, of a memorandum on the future of occupational health services, though at the moment this has not yet been approved by the Council. Its agenda contain matters involving the medical services in the mining, transport, or shipping industries, or public utility undertakings. On the initiative of the Association a number of joint councils of industrial health have been set up in appropriate areas. The Committee has made recommendations on the resettlement of tuberculous persons in industry. Many fields of occupational health research have been explored. Questions relating to the

examination of workers to determine fitness for employment, the notification of industrial diseases, the opportunities for careers in industrial medicine, postgraduate education for practitioners working in industry—all these matters and many others come continually in one form or another before the Committee. Like other committees also, it is called upon to give an opinion on, or sometimes to take action in, questions or disputes involving individuals or groups.

Possible difficulties in the relation between the industrial medical officer and the general practitioner have to be borne in mind. While ideally there should be perfect co-operation between the two, this is not always attained, owing to faults (or, more likely, inadvertences) on one side or the other. The workman at the factory whose temporary illness or injury is attended by the works doctor is also on the list of a general practitioner in the National Health Service. There is nothing to hinder a common-sense approach, but delicate situations do sometimes arise.

The Committee has also helped to maintain liaison with industrial leaders, on the one hand with the Trades Union Congress and on the other with the Employers Federation. For some years the Association has had a joint committee with the T.U.C. A panel of 16 members has been set up from whom a number are selected, according to the nature of the business to be discussed, to meet representatives of the trade unions, and in this panel several members of the Occupational Health Committee are included.

The work of some Association committees may well lessen or even disappear as time goes on, with the achievement of what they have set out to do; but the Occupational Health Committee has a very long way to go, and one can foresee for it an increasingly important role in Association counsels and in industrial affairs.

GENERAL MEDICAL SERVICES

DISCLOSURE OF CLINICAL DETAILS TO LOCAL MEDICAL COMMITTEES

Executive councils have a duty to recover the cost of a preparation prescribed if it appears to them that it was not prescribed as a drug. When an investigation into the facts is required a formal reference of the case is made, under the regulations, to the local medical committee, who then has the duty of making a finding which it communicates to the council.

Patient's Consent

In the past difficulties have occasionally arisen because the practitioner concerned has been unable to obtain the patient's consent to the disclosure of certain clinical details which are necessary if he is to be able to justify his prescribing. The objection is usually to the disclosure of medical information to the lay officials and lay members of the executive council. The General Medical Services Committee has therefore discussed with the Ministry of Health the best method of obviating the difficulty in the rare cases in which it arises.

The local medical committee, when the case is referred to it, are required to give the practitioner the opportunity of appearing before it or of submitting a statement in writing. The General Medical Services Committee and the Ministry feel that where the practitioner decides to submit a written statement including clinical details of a case no objection can be raised if the following procedure is adopted.

Suggested Procedure

The practitioner sends the details of the case to the secretary of the local medical committee, who is, in most cases, himself a doctor, or to the chairman of the committee. The secretary or chairman, as the case may be, discloses to his committee the clinical details which he receives, but without holds the name of the patient. The committee, in informing

the executive council of its findings, suppresses these clinical details, but the council will, of course, be in possession of the name of the patient through their clerk. Thus the secretary or chairman of the local medical committee is the only person who is in a position to connect the patient by name with the clinical details, and the objection to the disclosure of medical information to lay members and officials of the executive council is avoided.

CERTIFICATION FOR CREMATION

In view of the many inquiries received about cremation certificates the following statement is published to clear up misunderstandings which appear to have arisen.

Procedure of Certification

A special form is supplied by the crematorium company to be completed by an executor or the nearest relative, who must state, *inter alia*, that the deceased expressed no objection orally or in writing to cremation of his or her body.

A certificate ("B") of cause of death must be given by the doctor who attended the deceased during the last illness. A confirmatory certificate ("C") must be given by another medical practitioner of not less than five years' standing, provided that he is not a relative of the deceased or a relative or partner of the doctor who has given certificate B. The Home Office has advised that, when Form B is given by a house-officer in a hospital, Form C signed by another doctor of the hospital staff should be accepted only if given by the medical superintendent or, in the absence of such a post, by a consultant or senior hospital medical officer not in charge of the case. Failing these, Form C should be completed by an outside doctor. Both certificates B and C are also on a special form supplied by the company.

The Medical Referee

Certificates B and C are submitted to a "medical referee" appointed by the Secretary of State. If the medical referee is satisfied that the requirements of the Act have been complied with, that the cause of death has been ascertained, and that there exists no reason for any further inquiry or examination, he issues an "authority to cremate" and under this the superintendent of the crematorium is authorized to cremate the remains.

Fees

In 1951 the Annual Representative Meeting approved the following policy:

A suitable fee for the completion of either Certificate B or Certificate C is £2 2s., plus a mileage allowance, where applicable, at the rate of 1s. per mile or part of a mile, each way, outside a radius of two miles.

Special reference is made to cremation certificates in the Terms and Conditions of Service of Hospital Medical and Dental Staff (England and Wales). The furnishing of Certificate B is categorized as work within the scope of the hospital and specialist services provided under Section 3 of the Act, and therefore to be performed by members of hospital medical staffs as part of their hospital duties without charge. On the other hand, completion of Certificate C is deemed not to fall within the scope of the hospital and specialist services and may be given by members of hospital medical staffs on payment of an appropriate fee.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

GENERAL MEDICAL SERVICES COMMITTEE

COST OF THE N.H.S.

An all-day meeting of the General Medical Services Committee was held on July 23, Dr. A. TALBOT ROGERS presiding. The President of the Association (Mr. J. W. Tudor Thomas) was welcomed on his first attendance. A welcome was also given to the new members of the Committee.

One of the principal items of business was the consideration of a memorandum by the London Local Medical Committee on the cost of the N.H.S. Dr. N. Levitt and Dr. N. Fisher attended to present the memorandum. They stated that when the Minister announced the appointment of an extra-Parliamentary committee to inquire into the cost of the Service the London L.M.C. considered it important that the profession should conduct an independent parallel inquiry. They suggested that a suitable set of questionnaires should be sent to a random sample of specialists, general practitioners, hospital administrators, and others, and that the returns should be studied by statisticians. The result would be available for comparison with the report of the Guillebaud Committee.

The deputation was asked how London proposed to obtain the very detailed information it expected from the hospital service. Obtaining it would give the administrative people in the hospitals a great deal of trouble. Moreover, hospitals were not likely to pass on information until after their figures had been sent to the Ministry and collated into the annual report laid before Parliament. The reply of the deputation was that the questionnaire was only a suggestion, but it was thought that a well-run accounting system would enable any hospital to answer such questions straight away. They asked the Committee not to fasten on the details of the scheme, but to consider whether such an investigation was desirable.

The CHAIRMAN asked what a committee of the sort proposed could find out which the Guillebaud Committee itself would not already have found out. Most of the conclusions of the Guillebaud Committee when they came forward would be debatable on the ground of opinion rather than of fact. Dr. S. WAND said that he was averse to starting an inquiry which would necessitate bringing in statisticians and so become a public inquiry with the expression of majority and minority opinions.

Dr. M. SORSBY, on the other hand, considered that an inquiry ought to be undertaken, with all the branches of the Service participating, so that the profession might be prepared to meet all possible contingencies.

The SECRETARY of the Association (Dr. A. Macrae) described the steps which the Association had taken after the announcement of the Guillebaud Committee. A small group had been formed consisting of the chairmen of the Council, the Representative Body, and of a number of standing committees. So far it had not been possible to obtain any indication from the Guillebaud Committee as to topics on which it would welcome evidence from the Association. This committee of chairmen was to meet again in September to draw up a list of topics for the various standing committees to which the task of preparing evidence was to be referred. The committees would then decide for themselves how they would prepare their part of the evidence.

In view of the action already proposed, the Committee decided that no useful purpose would be served by embarking on an independent inquiry on the lines suggested by London.

Subcommittees Reappointed

The CHAIRMAN said that the Committee had sustained the loss of one of its most useful members, Dr. Frank Gray, who had failed to secure re-election through the Representative Body. A vote of thanks was accorded to Dr. Gray for his past services.

Subcommittees were reappointed, including the Scottish, Rural Practice, Health Centres, and Protection of Practices, and the Committee's representatives were also appointed on certain other committees of the Association. The 14 representatives of the Committee on the Working Party were reappointed, and seven members were nominated to act as the Committee's representatives on the Medical Functional Council and nine on its Committee "A" (General Medical Services). On the question of the Joint Formulary Committee, on which the Committee appoints four representatives, two others being appointed by the Consultants and Specialists Committee and two by the Science Committee, it was pointed out that, although this was a committee which was intended solely for the help of the general practitioner, the Association representatives were in a minority. It was agreed to ask the Council to look into the composition of this committee.

The CHAIRMAN stated that the report of the subcommittee which had been concerned with service committee and tribunal procedure had been adopted, with a few amendments, by the Conference, and he suggested, and it was agreed, that the subcommittee be reconstituted to look at these amendments, and to take the report, as amended, to the Ministry.

Conference Resolutions

The Committee then turned to the various resolutions of the Annual Conference and decided the action to be taken on each. A lengthy discussion took place on the resolution concerning the allocation of patients to general practitioners, that a practitioner should not, by reason of his terms of service, be compelled to take or retain a patient who was accepting treatment from an unregistered practitioner or from another registered practitioner with whom he was not acting in consultation. The difficulty of doing this, particularly in sparsely doctoring regions, was mentioned. One member suggested that the help of the General Medical Council should be invoked, in view of the liability to a charge of "covering" in a case in which an unregistered practitioner was concerned. Dr. GUY DAIN, however, a member of the G.M.C., pointed out that the G.M.C. could act only in the disciplinary cases which came before it on information received, and would not be prepared to lay down general directions. It was agreed to discuss the matter further with the Ministry.

Employment of Salaried Assistants

At a previous meeting the Committee had considered a recommendation from the Assistants and Young Practitioners Subcommittee that, save for a period of three years, no principal in single-handed practice should be permitted to have a list of over 3,500 patients by virtue of the employment of an assistant. This had been referred back for further consideration, and the subcommittee now brought forward a recommendation that the extra list of patients allowed in any given practice by virtue of the employment of an assistant should be 1,000 for any length of time, but that once the principal's list exceeded 4,500 he should, within a period of two years, be required to take a partner, or at the end of the two-year period again to bring his list within the 4,500 limit.

Dr. ROSE said that this imposed another restriction on the freedom of the general practitioner, and it would be one of their own making. After all, assistantship was a very necessary phase in the making of a general practitioner. Dr. J. C. ARTHUR said that there were infrequent instances of exploitation of assistants under the specious promise of a partnership, and the only way to put the matter right was by local check. Dr. M. SORSBY supported the proposal, saying that something must be done to satisfy the just demand on the part of these young practitioners. Dr. J. A. PRIDHAM said that there were, no doubt, infrequent cases of a man who had no ambition to be other than an assistant, but in the ordinary way it was natural to look forward to prin-

cialship and partnership. He thought that the proposition should not be turned down, but that some statistics should be obtained in order to discover the extent of the problem. Dr. A. D. JAVIES thought that three years would be more reasonable than two, and also took exception to the word "required," which meant regulation. Dr. WAND pointed out that during the past five years, having regard to economic circumstances, a great deal had been done to meet the case of the assistant aspiring to be a principal, and it should not be forgotten that the whole effect of this was to eat into the final income of the practitioner. Dr. BRUCE CARDEW thought the proposition on the right lines, and suggested that it would be a good idea if some local body was charged with the duty of seeing that assistants were not unfairly treated.

The CHAIRMAN thought that what the subcommittee had now brought forward was a considerable advance upon their earlier proposition, and he reminded the committee that an undertaking had been given to present some scheme to the next conference.

Finally, it was agreed that the proposition be referred back to the subcommittee with a view to obtaining more facts and figures which might help the Committee in reaching a decision, and that the subcommittee be assured that the matter would receive further sympathetic consideration.

Other Business

A long discussion took place on the question of the declaration of practice vacancies. A resolution from Wolverhampton stated that executive councils and local medical committees, in considering whether a vacancy should be declared, were entitled only to take into consideration the circumstances of the district, and that they exceeded their statutory duty if they took account of such matters as whether a partnership was bona fide or not. The Committee listened to legal arguments by Dr. J. A. GORSKY, but in the end reaffirmed its concurrence in what was stated in para. 75 of its recent Annual Report (*Supplement*, May 2, p. 165). This was, in brief, that agreement had been reached with the Ministry and the Medical Practices Committee that the latter should not, unless there were special circumstances, accept one partner as the logical successor of another who had died or resigned if the partners had not been in active practice together for at least about a year.

It was reported that representatives of the Committee had met officers of the Ministry with a view to exploring ways and means of utilizing the £100,000 set aside by the Working Party for the encouragement of group practice. The Ministry had undertaken to set out draft proposals, which would be considered by the committee at its next meeting.

The Ministry had expressed a wish to encourage some improvement in the standard of accommodation in surgeries and waiting-rooms, and it was intimated that at the September meeting of the Committee a draft memorandum on this subject would be presented to the Committee for information and criticism. The office would prepare this memorandum.

Ten members of the Committee were appointed representatives to constitute with the Ministry a working party for discussions on further ways of securing economies in the prescribing field, and to draw up a list of points for discussion.

The Committee received with appreciation a copy of a letter which had been sent by the College of General Practitioners to the Secretary of the Guillebaud Committee, in reply to a request from that body to submit evidence. The College had replied that it was not concerned with terms and conditions of service, and that if any points did arise which concerned the College they would be submitted through the General Medical Services Committee.

The Committee sat from 10.30 a.m. to 5.30 p.m.

Correspondence

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

Medicines Classified

SIR,—We have now been issued with the classified list of proprietary medicines and, after a preliminary gasp of amazement, have had time to appreciate the burdens which have been added to our prescribing difficulties. Included in category 6 are a number of remedies which have frequently been recommended by consultants of repute and which have stood up to the clinical test of usage in general practice over a number of years. For some of them there are no *National Formulary* equivalents. We are told in the accompanying letter from the chief medical officer that, of course, we may still prescribe what we think best; but behind this is the hardly veiled threat that, if we do, we are likely to be called to account.

I am not, in general, addicted to the prescribing of proprietaries, but some are not only convenient but even appear to be effective in that the patient is relieved. Are these old and tried remedies now to be cast aside? Are the clinical impressions of 20 years entirely worthless? And must I now produce to the local medical committee a controlled series with full laboratory data to support my prescription of "coramine" by mouth? This is, indeed, too large an encroachment upon our clinical liberty, and the patient is likely to suffer.—I am, etc.,

East Horsley, Surrey.

BASIL S. GRANT.

Cost of Prescribing

SIR,—May I be one of the first "self-confessed digoxin addicts" (Dr. Geoffrey Bourne's letter, *Supplement*, July 25, p. 66) who promise to save 2s. 6d. on each 100 tablets by ordering digitalis folia in the future as a maintenance dose?

I would save less than £1 a year, whilst the chap who orders "penidural," 12 oz. (372 g.), at 12s. 6d. per oz., mixtures of 40 oz. (1.2 kg.) at a time, and 36 capsules of "chloromycetin" for a simple afebrile sore throat wastes about £18 per week. No, Dr. Bourne, this will not do. Great economy was exercised when doctors dispensed medicines they paid for before '48, and only rigid inspection into wastefulness will curb the habit, fortunately exhibited by a minority only.—I am, etc.,

Luton.

H. JARVIS.

The A.R.M.

SIR,—I attended recently at Cardiff my first Annual Representative Meeting of the British Medical Association as a representative of the Manchester Division, and would like to record my two outstanding impressions of the meeting.

The first was the wonderful job of preparatory work and organization which made possible the amazing smoothness of the entire proceedings; and I wish to congratulate on this both our Welsh hosts and the staff of the British Medical Association, both lay and medical. The second was the democratic way in which the entire meeting was conducted. To me, a newcomer, it was a revelation how the body of the meeting could control the time allotted to speakers, how simple it was for any delegate to speak to any motion or amendment, how readily last-minute amendments were received, and how the decision whether or not they should be discussed again lay with the representatives. I would also like to pay tribute to our very able Chairman, Dr. S. Wand.

I would like to point out an omission in the report (*Supplement*, July 18, p. 27) of the few remarks I made

H.M. Forces Appointments

ROYAL NAVY

Surgeon Commanders T. L. Cleave and J. H. Nicolson to be Surgeon Captains.
Surgeon Lieutenant-Commanders (Acting Interim Surgeon Commanders) C. A. St. C. Hiley, P. G. Rowsell, G. S. Irvine, P. S. Fuller, P. B. Nicol, and W. M. Davidson, O.B.E., to be Surgeon Commanders.
Surgeon Lieutenant-Commander C. M. Lamont, V.R.D., to be Surgeon Commander.
Acting Interim Surgeon Lieutenant-Commanders B. Geoghegan and W. Cullen to be Surgeon Lieutenant-Commanders.
Surgeon Lieutenant R. H. Cowling to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commander K. Forsythe, V.R.D., to be Surgeon Captain.
Surgeon Lieutenant-Commanders J. F. Foulkes, V.R.D., A. R. Harper, V.R.D., and T. S. Eimerl, D.S.C., to be Surgeon Commanders.
Surgeon Lieutenants J. C. E. Peshall and R. R. Wilson to be Surgeon Lieutenant-Commanders.

ROYAL ARMY MEDICAL CORPS

Captain W. L. Sanders to be Major.

REGULAR ARMY RESERVE OF OFFICERS

Major-General (Honorary Lieutenant-General) Sir Gordon Wilson, K.C.S.I., C.B., C.B.E., M.C., Major-Generals D. C. Monro, C.B., C.B.E., D. T. Richardson, C.B., M.C., W. C. Hartgill, C.B., O.B.E., M.C., Sir Alexander G. Biggam, K.B.E., C.B., L. T. Poole, C.B., D.S.O., M.C., R. E. Barnsley, C.B., M.C., Q.H.S., C. M. Finney, O.B.E., Brigadier H. T. Findlay, and Colonel G. O. F. Alley, M.C., late R.A.M.C., having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers.

ROYAL ARMY MEDICAL CORPS

Major D. C. Muir, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, and has been granted the honorary rank of Lieutenant-Colonel.

Major A. Torrie, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, and has been granted the honorary rank of Brigadier.

Captain (War Substantive Major) (Honorary Lieutenant-Colonel) J. Neill, O.B.E., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

Captain C. R. M. Greenfield, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, and has been granted the honorary rank of Major.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Lieutenant (War Substantive Captain) G. S. Tupman, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel R. J. S. Doherty has been granted the acting rank of Colonel.

Major F. H. Blackburn, T.D., has been granted the acting rank of Colonel.

Majors J. Baxter and H. B. Lee, T.D., have been granted the acting rank of Lieutenant-Colonel.

Captain (acting Major) J. Petrie has been granted the acting rank of Lieutenant-Colonel.

Captains G. I. Cameron and W. Lees have been granted the acting rank of Major.

Lieutenant (Honorary Major) M. J. McSwiney has retired.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel J. G. Morgan, C.B.E., T.D., from Active List, to be Colonel, and has been regranted the honorary rank of Brigadier. Colonels D. L. Kerr, O.B.E., T.D., and M. H. Summers, D.S.O., T.D., from Active List, to be Colonels.

Lieutenant-Colonels C. K. Sconce, T.D., and D. W. E. Lloyd, M.C., T.D., from Active List, to be Lieutenant-Colonels.

Major (Honorary Lieutenant-Colonel) H. B. Porteous, M.B.E., T.D., has ceased to belong to the T.A.R.O.

Major F. C. Rodger, from Active List, to be Major, and has been granted the honorary rank of Lieutenant-Colonel.

Majors J. H. Green, W. B. Evans, G. Savill, G. Lancaster, and D. M. Williamson, from Active List, to be Majors.

in the discussion on the "Remuneration of Hospital Medical Staffs." I stated that the consultants and specialists in the Manchester area were of the opinion that "an adequate betterment factor" (Nottinghamshire motion) would be 100%.—I am, etc.,

Manchester.

T. D. CULBERT.

Capitation System Unsatisfactory

SIR,—To my mind not only do the proposals of the Working Party fail miserably to satisfy its terms of reference, but they are bound to fail as long as they do not accept the fact that the present capitation system, with its competition between doctors for patients, is an unsatisfactory basis for medical organization.

In the first place the capitation system, by rewarding quantity rather than quality, tends to encourage and indeed depends for its rationale on a maldistribution of work. It exerts a constant insidious economic pressure on those who are able to take on more work than the dictates of reason or optimum efficiency would otherwise suggest. It tends to overwork one half of the profession and underwork the other half. In neither case is true justice or full efficiency being achieved.

The fundamental problem of the small-list practitioner is his small list, not his small income. The solution therefore will not be found merely by loading the first 1,000 patients as opposed to any other 1,000, even though some modicum of justice may thus be satisfied. The solution will only be found when we have a system which ensures, so far as humanly possible, that every practitioner is working to optimum capacity. Not until then can it be said that the best possible service is being made available to the public.

In the second place, competition between doctors for patients, rather than competition for posts, is in its present form the main obstacle to rational organization and full co-operation between practitioners. It leads to isolated and therefore relatively less efficient work. It prevents the widespread promotion of group practice and ultimate unification with the hospital and local authority services. It perpetuates a negative *laissez-faire* attitude to medicine which is the antithesis of that preventive and social outlook which should complement the individual approach and inspire a vigorous National Health Service.

In this connexion "freedom of choice" should not be claimed as an absolute rule, but only as one important relative principle to be followed as far as circumstances permit. Absolute freedom of choice never did and never can exist. No one can choose a doctor in John o'Groats who himself lives at Land's End. Most people are content with a convenient doctor so long as they are free to change should they wish. This is the most that freedom of choice usually necessitates. There is no reason therefore why in a planned medical service practitioners should not be ensured an optimum list, at the same time as patients are ensured reasonable freedom of choice. If one doctor in a group tended to attract more patients than his optimum, then a waiting-list or some such device could be instituted so that patients could transfer when a vacancy occurred.

In short I would plead for the leaders of our profession to consider anew whether they could not devise some more rational organization of our work, such as a modified salaried service which would maintain the maximum of freedom compatible with reasonable efficiency, to the benefit of both the profession and the public.—I am, etc.,

Bransgore, Hants.

A. C. McLEISH.

POINTS FROM LETTERS

Extraordinary General Meeting

Dr. W. J. GRANT (Shrewsbury) writes: Dr. E. Sladen (*Supplement*, July 11, p. 14) asks why I contend that "the G.P. who is getting his £500 'bonus' on 1,500 patients (2,000 total) should look after the first 500 at the low rate, and the G.P. with the 750 list look after his total number at the 'bonus' rate." I made no such contention, and Dr. Sladen's question seems to arise from a misunderstanding of the distribution scheme, as would appear from the figure 2,000 which he inserts in brackets. It is a 1,500 list which qualifies for the £500 bonus. I asked why a 750 list did not attract at least half that "bonus." It draws only one-quarter that amount. . . .

The notifications concerning Lieutenant-Colonels S. W. Barber, M.B.E., T.D., and S. R. Trick, O.B.E., T.D., published in *Supplements* to the *London Gazette* dated March 20 and May 1, respectively, have been cancelled.

Captain (Honorary Major) I. N. MacIver has relinquished his commission, retaining the honorary rank of Major.

Major E. H. Markly has relinquished his commission.

Captain J. H. B. Livingston, T.D., has relinquished his commission and has been granted the honorary rank of Major.

B.M.A. LIBRARY

The following books have been added to the Library:

- Arruga, H.: *Ocular Surgery*. Translated from the Third Spanish edition by M. J. Hogan and L. E. Chaparro. 1952.
Ascoli, R.: *Principi di Chirurgia Generale*. 1952.
Aurelianus, C.: *On Acute Diseases and On Chronic Diseases*. Edited and translated by I. E. Drabkin. 1950.
Baker, J. R.: *Abraham Trembley of Geneva: Scientist and Philosopher, 1710-1784*. 1952.
Baudouin, C.: *De l'Instinct a l'Esprit: précis de psychologie analytique*. 1950.
Brobeil, A.: *Hirndurchblutungsstörungen*. 1950.
Bürger, M.: *Klinische Fehldiagnosen*. 1953.
Chatterjee, K. D.: *Human Parasites and Parasitic Diseases*. 1952.
Daubresse, E.: *L'Origine des Maladies: essai de synthèse*. 1951.
Drolet, G. J., and Lowell, A. M.: *A Half Century's Progress Against Tuberculosis in New York City*. 1952.
Edwards, L. B., et al.: *B.C.G. vaccination: Studies by the W.H.O. Tuberculosis Research Office, Copenhagen*. 1953.
Goodale, R. H.: *Clinical Interpretation of Laboratory Tests*. Second edition. 1952.
Gottlober, A. B.: *Understanding Stuttering*. 1953.
Griebel, C. R.: *Der Gesunde und der Kranke Kehlkopf im Röntgenbild*. 1952.
Györkö, A. C.: *La Lepra en el Archipiélago Canario*. 1952.
Hall, B. H., et al.: *Psychiatric Aide Education*. 1952.
Holzer, W. (Editor): *Therapie de Nerven- und Geisteskrankheiten*. 1951.
Kottmaier, J. (Editor): *Taschenbuch der praktischen Medizin*. 2. Auflage. 1953.
Kräyenbühl, H., and Richter, H. R.: *Die zerebrale Angiographie*. 1952.
Kreiner, W. M.: *Zur Technik der Kropfoperation*. 1952.
Lancaster, J. E.: *Manual of Orthoptics*. 1951.
Lectures on the Scientific Basis of Medicine. Volume I, 1951-2. 1953.
Lederle Laboratories: *Aureomycin: bibliography and index*. 1951.
Lezius, A.: *Die Lungenresektionen*. 1953.
Linderström-Lang, K. U.: *Proteins and Enzymes (Lane Medical Lectures)*. 1952.
Lorenzen, H.: *Leibesübungen mit Körperbeschädigten*. 1951.
Maciejewski, A.: *Functional Treatment of Congenital Dislocation of the Hip Joints in Children*. (Polish text with English summary.) 1951.
Mackintosh, J. M.: *Trends of Opinion About the Public Health, 1901-1951*. 1953.
Mittermaier, R.: *Die Krankheiten der Nasennebenhöhlen, der Ohren und des Halses im Röntgenbild*. 1952.
Moseley, H. F.: *Textbook of Surgery*. 1952.
Myers, B.: *The Reminiscences of a Physician*. 1949.
Nielsen, J. M.: *Textbook of Clinical Neurology*. Third edition. 1951.
Pagel, W., Simmonds, F. A. H., and Macdonald, N.: *Pulmonary Tuberculosis*. Third edition of Kayne, Pagel, and O'Shaughnessy. 1953.

Notes and News

Hospitality Wanted.—A Yugoslav surgeon who speaks English seeks hospitality in the London area for one or two months in return for hospitality in Dalmatia. Suitable dates could be arranged. Any reader interested should first communicate with Dr. H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Emergency Equipment at Home.—When life-saving equipment—for example, oxygen tents, respiration machines—is needed from a hospital for use in a patient's home, hospitals are to supply it on the application of the patient's general practitioner. They are not to wait for the recommendation of a hospital specialist, which is the usual course when there is no urgency (R.H.B. (53) 81).

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS, 1954

The Council of the British Medical Association is prepared to consider the award, in 1954, of prizes to medical students for essays submitted in open competition. The subject of the essay will be: "Is the Medical Curriculum too Heavily Loaded?"

The purpose of this competition is to promote systematic observation among medical students. In awarding the prizes due regard will be given to evidence of personal observation. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. Previous prizewinners are eligible for a second award of a prize.

Any medical student who is a registered member of a medical school in the United Kingdom or the Colonial Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association will be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made. In determining the number and amount of prizes to be awarded, the Council will take into consideration the number and standard of essays received.

It is suggested that essays should consist of from 2,000 to 5,000 words. Essays must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a note of the name and the medical school of the entrant. Notice of entry for this competition is necessary and a form of application can be obtained from the undersigned.

Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than December 31, 1953. Inquiries relative to the Competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

A. MACRAE,
Secretary.

Association Notices

FORMATION OF NEW WEST LOTHIAN DIVISION

Notice is hereby given by the Council to all concerned that it is proposed to reconstitute the existing Lothians Division into two separate Divisions as follows:

- An East and Mid Lothian Division comprising the Counties of East and Mid Lothian.
- A West Lothian Division comprising the County of West Lothian.

Any member affected by this proposal and objecting thereto should write to the Secretary of the Association by Monday, August 31, 1953.

A. MACRAE,
Secretary.

Diary of Central Meetings

- SEPTEMBER
16 Wed. Guillebaud Evidence Committee, 11 a.m.
30 Wed. Occupational Health Committee, 11 a.m.

Meetings of Branches and Divisions

SOUTH STAFFORDSHIRE DIVISION

The annual meeting was held in Wolverhampton on June 5, 1953. The following officers were elected:

- Chairman.—Mr. W. Leslie Thomas.
Vice-chairman.—Dr. Jessie E. Pringle.
Hon. Secretary and Treasurer.—Dr. L. C. Rutter.

WAKEFIELD, PONTEFRAC, AND CASTLEFORD DIVISION

The annual divisional meeting was held at the Clayton Hospital, Wakefield, on May 17, 1953. With Dr. T. Gardner in the chair, there were nine members present. The following officers were elected for 1953-4:

- Chairman.—Dr. Marjorie Steven.
Vice-chairman.—Dr. L. Watson.
Hon. Secretary and Treasurer.—Dr. A. G. James.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 8 1953

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The B.M.A. in Committee

MEDICAL SERVICE IN THE ARMED FORCES

During the greater part of its existence the Association has had, under one name or another, a committee charged with the interests of doctors in the medical services of the defence Forces. Until recent years this was known as the Naval and Military Committee; it now appears under the name of the Armed Forces Committee. At present it consists of 17 members, apart from the principal officers of the Association, who are members *ex officio*. The members include high-ranking officers of all the three Services and civilian practitioners with Service experience, together with one representative from the Medical Branch of the Royal Navy, the Royal Army Medical Corps, the Medical Branch of the Royal Air Force, the Territorial Army R.A.M.C., and the Royal Navy and Royal Air Force Volunteer Reserves.

Backroom Committee

Not much is said, usually, when the reports of this Committee come forward to the Council, and through the Council to the Representative Body. They are generally taken towards the end of the proceedings, and evoke little or no discussion, because, except during the times to which that inadequate word "emergency" applies, the affairs of this Committee are of direct interest only to a small section of the profession—that is to say, the men and women who have commissions in the Services—although, to be sure, many civilian doctors carry out part-time or occasional work in some form for Services personnel.

The Association has never relaxed its vigilance concerning the position of its members who are in the defence Forces. It is realized that many of them, by reason of their location and their frequent change of place, are outside ordinary Branch and Divisional organization; moreover, they are subject to regulations and discipline and are not allowed to combine in the way which is open to people in practically every other form of employment. The Association has always been, and still is, the obvious body to take a comprehensive view of the conditions of medical services in the Forces as compared with services outside, and to make the necessary representations to the defence departments. Indeed, the history of the Association is full of instances of effective intervention on behalf of these officers, and, although obduracy on the part of the powers that be has often been encountered, the position of these officers and the efficiency of the service that they can give to those under their charge have—to use a hackneyed phrase—improved out of all recognition.

Balaclava Surgeons

To appreciate this it is necessary only to glance at the very different position of these men a hundred years ago. To take the Army alone—though a similar state of affairs obtained in the Navy—the ordinary medical officers in the middle of the nineteenth century suffered many injustices. They were not really regarded as part of the Army at all, but only as camp followers, although they shared the perils of Army campaigns and had their share of wounds and disease. The conditions of admission to the Service and promotion in rank would now be regarded as intolerable. The successful candidate in an examination might have to wait for years for a commission as assistant surgeon with the rank and pay of a lieutenant, plus a shilling a day.

The Struggle for Status

At a time when that "bothering woman" (her own description), Florence Nightingale, was preparing herself to undertake the gigantic task of reforming the health administration of the British Army, and moving heaven and earth (which included Queen Victoria and the Prince Consort, as well as the Panmures and other "bullyable mortals") to secure the setting up of a Royal Commission to investigate the administration of the Army Medical Department, the Commission to be filled with her own nominees, while she arranged who should *not* be the next Director-General of the Department—at the time this was happening the Association was also moving, presenting in 1857 a comprehensive memorial on a thorough reorganization of the medical services. It was urging that none but properly qualified medical men should be engaged; that, once commissioned, they should enjoy absolute equality with other officers and have like authority over those serving under them, and that they should be equally well provided in respect of pensions and eligibility for distinctions and rewards of good service. In 1858 new Army regulations were issued which remedied the position to some extent, though in practice they were often rendered ineffective as a result of the resentment of combatant officers on seeing a subordinate department raised to relative independence and power.¹

For many years Army medical reform continued to be a live subject in the Association, and the status and security of the medical officer were a matter of constant argument between Great Queen Street or the Strand, where the Association had its offices, and Whitehall. For a long time the Army surgeon was still regarded by the authorities as not quite a civilian nor quite a soldier, and suffered from the disadvantage of the worst of both worlds. His promotion was blocked; the conditions which awaited him on retirement were most unsatisfactory; when working in hospital he had no authority even over his own orderlies; his work

¹The full story is told by Mr. Russell Coombe in a short history published in the *Handbook* of the Association in 1921.

compelled him to have a horse, but he was never sure of his forage allowance. A new code of Army regulations came in in the 'nineties, thanks again to an Association committee which was still considering Army medical reform.

The Royal Corps

The creation of the Royal Army Medical Corps, which was announced in 1898 by the Secretary of State for War, Lord Lansdowne, may be said to be an Association achievement. The Service was further improved after the South African War, again largely on the initiative of the Association, which made important recommendations concerning promotion, increase of pay, and pension rights. The work of the Association during the two great wars deserves a separate chapter, or many chapters, to itself. A word may be said about the work of the Naval and Military Committee, as it then was, in connexion with the many problems arising from the demobilization of medical officers after the war of 1939-45. Release leave, allowances, disability pensions, absorption into civilian work, and refresher courses for released officers were among the questions that crowded forward.

The Interests of Service M.O.s

To-day the Committee is perhaps more pedestrian but none the less useful. On Service pay and recruitment it has lately prepared and submitted a memorandum through the Council to the Working Party set up by the Ministry of Defence. The idea has been to secure for medical officers in the Services a position as comparable as possible to that of the civil practitioner. The inadequacy of widows' pensions has also recently been a matter for representation. The Association's Medical Practices Advisory Bureau offers its services to medical officers on retirement if they are seeking to take up civil appointments. The Committee keeps in close touch with the Medical Directorates of all three Forces. It does not intervene in cases of individual grievance unless the individual concerned has availed himself of the internal machinery open to him in his Service and apparent injustice still remains. The Committee gets little publicity, but it is performing a most useful function in the tradition of the Association from its very beginning.

REVIEW OF THE N.H.S.

NO DRASTIC CHANGES—Minister

The Minister of Health gave an assurance last week that he has no intention at present of making any drastic changes in the basic structure of the Health Service. Introducing the annual report of the Central Health Services Council,¹ he draws attention to what he and the Council consider to be its most important single piece of work in 1952—namely, the study of medical research in relation to the National Health Service. It was carried out by the Standing Medical Advisory Committee and the Medical Research Council. The fruits of this study—recommendations greatly to expand clinical research—were published recently and discussed in the *Journal* of July 18 (p. 140). Most of the Council's work was reported in these columns when it was first published, and may be briefly summarized here.

A number of recommendations were made on improving the welfare of patients in hospital, and daily visits from parents of children in hospital were also advocated provided that adequate safeguards are taken against infection. The Council considers that cancer education should be carried out locally by voluntary bodies, not by any central government organizations. Some action should be taken to ensure that people seeking work in this country from abroad should be free from infectious tuberculosis when they arrive.

¹Report of the Central Health Services Council for the Year Ended December 31, 1952. H.M.S.O. 1s. 3d.

Minister-Hospital Consultation

With the Council's recommendation that regional hospital boards should be fully consulted by the Minister on the application of policy in the hospital service, Mr. Macleod expresses his whole agreement. He adds that, "while ultimate direction from the centre is unavoidable, I am satisfied that it should be kept to the minimum and that those responsible for running the Service should have as much say as possible in its development. I hope it is fair to say that this conception of partnership is given effective expression in the regular consultation between members and officers of the hospital authorities and my Department."

He also makes the point—of special topical interest—that hospitals should take full advantage of the help they can get from medical officers of health in investigating outbreaks of infectious diseases and food-poisoning, and admonishes those "too many hospitals" whose practice "has been defective in this respect." The dental services in hospitals are described as being "generally most inadequate, for patients and staff alike."

Correspondence

Cost of Prescribing

SIR,—The chief medical officer of the Ministry of Health is assured of the loyal support of all medical men concerned in response to his recent appeal to them to help reduce the huge N.H.S. drug bill. It is encouraging also to learn that the right to prescribe whatever we think necessary in any individual case is not to be taken from us, subject to justification of the cost to our colleagues on the local medical committee, if called upon to do so.

In the exercise of this right fellow-practitioners may, however, be unaware of the time, trouble, and expense to which unwittingly they may be committed, as the following example will show.

In December, 1950, a medical consultant, in whose judgment I have every confidence, found a patient of mine, an agricultural labourer, to be suffering from an active gastric ulcer, confirmed radiologically. To heal this he advised a period of strict bed-rest at home on the Witt 3 hospital diet. He gave the patient a copy of this, and in his report to me asked if I would supply the (only) medicaments named therein—namely, vitamins A, C, D, and "marmite." In accordance with the ethics of medical consultation I did so, prescribing on the E.C.10 form a liquid combination of A and D, ascorbic acid tablets, and—since the patient had read the sheet—the B complex as "marmite," an 8-oz. (240-g.) jar.

A year later I was invited by the local medical committee to justify the prescription of this marmite. I explained that the specialist had advised it, and sent a copy of the diet sheet. The committee decided they had no alternative but to have me surcharged the marmite, as it is classified as a "food" in the First Report of the (Cohen) Definitions of Drugs Joint Subcommittee. In forwarding this decision their secretary explained my right to appeal to the Minister, and I elected to exercise it. Inadvertently I omitted to lodge the appeal within the month allowed, but the secretary of the Ministry then wrote to remind me and accepted the appeal a few days later.

Another year passed before I was invited to appear personally or be represented legally 50 miles away at Cambridge, so that the referees, a lawyer and two doctors, could decide whether the marmite was or was not a drug in the circumstances in which I had prescribed it.

I duly appeared, supported by a solicitor from a firm commissioned by my defence union. We were accorded a careful and courteous hearing. I reiterated the explanation given to the local medical committee, stated that the specialist had since confirmed that the patient "really needed" these medicaments, and added that—since reading

up the subject—I now thought the diet advised was probably deficient in the B vitamins. I also explained that it is now thought that there is a greater need of the B complex vitamins in cases of peptic ulcer, owing to their beloved increased local destruction in that disease. In this connexion I invited the referees to consider the third sentence in the section on vitamins on page 36 of the (1952) *National Formulary*, and other references.

A copy of their report to the Minister has just been received. They state that it is clear to them from perusal of the diet sheet that the marmite and other vitamins were intended as part of the diet, so my appeal is disallowed. I am sure they are as anxious as I am that this decision should have publicity.—I am, etc.,

Mattishall.

CHARLES S. THOMSON.

SIR,—I would respectfully point out to Dr. Geoffrey Bourne (*Supplement*, July 25, p. 66) that his criticism of digoxin on economic grounds omits certain important facts. As a dispensing practitioner, I find fault with tablets of digitalis leaf on two grounds, economic and therapeutic. There is considerable wastage in the dispensing pack and in the pillbox from disintegration to powder. In many households I have seen these tablets spoilt by damp. These drawbacks are totally avoided by the use of a hard, stable, polished tablet. Allow me to disclaim any proprietary interest in digoxin.—I am, etc.,

Sedburgh.

H. THISTLETHWAITE.

The G.P. and the Industrial Medical Officer

SIR,—I am grateful to Dr. G. MacBain (*Supplement*, July 11, p. 13) for his friendly and courteous criticisms of my letter (*Supplement*, June 27, p. 314). There is no fundamental divergence between our views, for I agree with him that it is not in the patient's interest that doctors should quarrel over him, and that reciprocal courtesy and understanding should ensure that conflicts do not occur. I know of the inspiring project of the Corby Diagnostic Centre and of the very happy relationship between Dr. MacBain's organization and his general-practitioner colleagues. Ideally, this kind of relationship should exist wherever there is an occupational health service. I believe that in Corby there are special conditions—a very large works which dominates the town, and a small number of general practitioners—which have facilitated personal contact; though this does not make his achievements any less praiseworthy.

But can it honestly be said that in Corby, or in any other place where similar good relations exist, the credit should be given to the ethical rules for industrial medical officers? In these circumstances the doctors concerned, because of their personal regard for each other, have tacitly agreed between themselves that the rules are superfluous, and shall not in fact govern their relations, which are founded instead on ordinary professional courtesy. Do the rules then help to improve a less happy situation? There is abundant evidence that they frequently have the opposite effect. Not every doctor is uniformly courteous, either in industry or in general practice. The rules are apparently aimed at teaching manners to the industrial medical officer, but have nothing to say about the discourteous general practitioner.

There is more involved in this discussion than mere considerations of the status and prestige of the industrial medical officer. The establishment of a comprehensive occupational health service is accepted B.M.A. policy, and employers and employees alike will expect such a service to provide for treatment, so far as this can reasonably be given at the place of work, with a view to minimizing loss of working time. It is they, rather than the medical profession, who are the final arbiters, although there is every reason to think that they will recognize, as they have always done in the past, that there is such a thing as medical etiquette. The trend is illustrated by a recent press report that a large general hospital in the Midlands, unable to fill two vacancies for casualty officer and house-surgeon, has appealed to those factories with medical departments not to refer cases to hospital, but to treat them as far as possible in the works surgery.

The Ethical Rules, though revised in 1949, are still inspired by the same spirit as the original ones, drawn up when most industrial medical officers were in general prac-

tice. The drafters appear to have been dominated by the fear that the works doctor might induce his colleagues' patients to transfer to his practice, and the rules were intended to guard against this. Since then things have changed; occupational health services have played an increasingly important part in our national life, and will continue to do so. Whatever branch of the profession we practise in, we owe it to our patients to collaborate for their good; but this must surely be on a footing of equality, a relationship engendered by the quality of the work we do, and not one prescribed by an anachronistic code.—I am, etc.,

Birmingham.

F. H. TYRER.

Sweated Doctors

SIR,—The following vacancies have been publicly advertised during the current month by hospitals in the Home Counties:

Job	Age	Pay/Week	Weekly Hours			Notes
			Duty	Free	Total	
Junior house-officer (first 6 months)	Any	£6 15 0	136	32	168	Whether provisionally or fully registered
Hospital clerk	25	6 15 0	Unstated			
Gardener's labourer	—	6 2 0	48	120	168	
Theatre orderly (shift)	—	6 11 0	48	120	168	
Kitchen porter	—	6 2 0	48	120	168	
General porter (shift)	—	6 2 0	48	120	168	
Shorthand typist	25	5 10 0	Unstated			

In the same period the Industrial Court has raised to £7 5s. a week the wages of general clerks aged 25 employed in the London office of the National Society of Painters. Into the comparative earnings and hours of such workers as miners, dockers, market porters, and skilled transport men of similar age I hesitate to delve.

Of all the above N.H.S. jobs, which can compare in responsibility, difficulty, anxiety, wear and tear, and risk with that of the house-officer, with the lives of patients on his hands, night as well as day? In which other of them is the holder obliged, as a condition of his employment, to insure himself against actions for damages? Who but he can earn no overtime, and never be sure of an unbroken night except on six or seven days a month?

Look at the figures. Obvious underpayment (both relative and absolute) on the one hand; overwork no less obvious on the other—what are conditions such as these but the merciless exploitation of young doctors, especially when aggravated by the increasing and very intelligible difficulty of filling resident vacancies?

The house job at the top of my list (which offers only one free week-end in four) is possibly an extreme case; but in the common cases of one free week-end in three, or even in two, the total hours of freedom (to compare with the 120 granted to all the other listed jobs) are still only 36 and 41 respectively.

How in such conditions can a young doctor look after his patients properly even if he ignores his own health? Is the B.M.A. asleep?—I am, etc.,

Hove.

W. B. MANLEY.

Ophthalmic Services

SIR,—In the reports of the Cardiff meeting of the B.M.A. I have failed to see any reference to the inconsistencies of the Supplementary Ophthalmic Services. How many of our G.P. and specialist colleagues realize that the O.M.P. has to provide his own establishment and equipment himself for which he gets no compensation and no pension? His only alternative is to work in an optician's shop, where the medical atmosphere of eye symptoms as part of ill-health is replaced by the commercial one of whether or not a nice new pair of spectacles should be purchased.

How much longer are we going to tolerate the numerous patients who, while retaining a private general practitioner, come for a sight test on the N.H.S. and proceed to purchase an expensive pair of spectacles from the optician made up to our National Health prescription? Was there ever a better example of cut-price medicine?

It is surely time that this abuse of our profession be stopped. It should be made possible for anyone needing glasses to receive a free test and a free pair of glasses made to a limited but adequate specification of frame under the N.H.S., but any person wanting anything more elaborate than this should pay for both the sight test and the glasses.

The only alternative is to restore the State sight-testing fee to a proper level, but this would cost the Exchequer considerably more.—I am, etc.,

Redhill.

F. J. CURTIS.

Use of Health Visitors

SIR.—The following is an extract from a letter sent to general practitioners in this area recently:

"If you have not already read the report of the Annual Representative Meeting of the B.M.A. concerned particularly with the Public Health Committee and under the heading 'Health Visitors,' I hope you will do so. It is to be found on pages 25 and 26 of the *Supplement* to the *British Medical Journal* of July 18. The meeting carried the following motion:

"That the Association welcomes health visitors working under the guidance of general practitioners as a means by which such practitioners may increase the help they can give to patients, and that the Council be requested to consider ways whereby the help given by health visitors to general practitioners may be increased."

"Dr. W. E. Dornan (Sheffield) said that his group of medical practitioners had the services of a health visitor placed at their disposal and working to their orders in co-operation with the services provided by the local health authority.

"In this Division the health visitors are available to visit cases at the request of medical practitioners and to assist patients in carrying out the advice and orders of their doctor and to report direct to that doctor any matters of which he should be informed. Health visitors have been instructed that they are to carry out this work if and when requested and to do their utmost to co-operate with general practitioners. Doctors in this area have in the past made little use of health visitors, and I find it difficult to believe that there are not cases where a report of a test feed or other services of the health visitor would not be useful. I hope, therefore, that you will consider whether it is not possible for general practitioners and the local health authority to make a better use of health visitors in the future than in the past."

I shall be gratified if it elicits a favourable response.—I am, etc.,

Otley, Yorks.

R. A. W. PROCTER,
Divisional Medical Officer.

Notes and News

Housing of Nurses.—The Ministry of Health questions whether an unduly large share of the available resources is not being spent on nurses' accommodation, to the prejudice of some other important developments. The practice of "living in," it says, is established by tradition as normal for nursing staff, and it asks whether it continues to be justified by the conditions of the nurses' work or the needs of the service. The Standing Nursing Advisory Committee has now come to the conclusion that, subject to certain reservations, "There are no factors inherent in the work of a hospital nurse that make it necessary that she should live in the hospital in which she works or in near-by accommodation provided by the hospital authority." The chief difficulty is obtaining accommodation at a reasonable cost and reasonably accessible to the place of work. So the Ministry indicates in R.H.B. (53) 83 that hospital authorities should help their nurses and other employees to find suitable living accommodation, and they might consider following the example of university authorities by maintaining registers of approved lodgings to which nurses and others in need of accommodation could be referred.

Assistance to Pay Charges.—The total amount of national assistance granted in 1952 to meet charges raised under the National Health Service was just over £600,000. Of this, £209,000 represented the refund of shilling charges for prescriptions from June 1 onwards, when the charges began.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Captains F. L. Holroyd and I. M. Grant to be Majors.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major W. Mackenzie, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

REGULAR ARMY: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

Lieutenant (War Substantive Major) A. Kirshner has relinquished his commission, and has been granted the honorary rank of Lieutenant-Colonel.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: M. A. Byer, M.B., Ch.B., M.P.H., Medical Officer of Health, Barbados; H. C. Foster, M.D., D.T.M.&H., Assistant Director of Medical Services, Tanganyika; K. Sperber, M.D., D.P.H., Medical Officer, Gold Coast; L. J. Miller, L.M.S.S.A., Medical Officer, Zanzibar; D. R. Gunn, M.B., F.R.C.S., Orthopaedic Surgeon, Federation of Malaya; L. H. Hatcher, M.B., Medical Officer, Fiji.

Association Notices

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship of the value of £250.
A Walter Dixon Scholarship of the value of £250.

These scholarships will be awarded to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

Each scholarship is tenable for one year commencing October 1, 1954. A current scholar may apply to be re-appointed for an additional year. No scholarship may be held for more than three years. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships must be made not later than March 1, 1954, on the prescribed form, a copy of which will be supplied on application to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

Diary of Central Meetings

SEPTEMBER

11 Fri. Public Health Committee, 2 p.m.
23 Wed. Arbitration Committee, 2 p.m.

Correction.—We regret that in our report of the Annual Representative Meeting (*Supplement*, July 18, p. 26) we attributed to Dr. A. Y. Cochran (Edinburgh) the contribution to the discussion made by Dr. N. J. Cochran (Burton-on-Trent).

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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The B.M.A. in Committee

PRIVATE PRACTICE

Several of the committees of the Association are inadequately named in view of the range of work which falls to them. It is not possible to put into a short title what they do. This is conspicuously true of what is now called the Private Practice Committee—a committee of 16 or 18 members dealing with matters affecting private practice which do not come within the purview of those other committees whose concern is with the various medical services under the National Health Service Act. It would be difficult to hit upon a name which could describe in a word or two the miscellaneous agenda which confront the Private Practice Committee at its (normally) quarterly meetings. It must not be assumed that it is a committee which deals with the left-overs—the odds and ends which the National Health Service has failed, or scorned, to pick up. Many of the items, numbering perhaps thirty or forty, which come before it at its meetings may appear to be matters of small detail, but all of them have their importance, general, local, or individual. Moreover, some of the questions have a habit of recurring again and again, cropping up in new guises and requiring a modification of a previous decision or a reaffirmation of it. If one looked up the records of the committee or of its predecessor ten years back one would find many of the questions, such as points on certification, fees for medical reports for assurance companies, and so on, very much as they keep presenting themselves to-day.

The fact is, of course, that the work which a practitioner may be called upon to do, outside the National Health Service as well as within it, is so various and complex, so much dependent upon the particular situation, that it cannot be reduced to a rigid pattern, either of obligation or of remuneration. The committee which looks after the interests of the practitioner on the private side of his work must be flexible and prepared to consider many similar cases from the point of view of each particular one. The doctor's work is not a fit field for the methods of quantity surveying. The assessment of fees, the decisions on conditions of appointment, and innumerable other matters have to be reviewed again and again, and in the Private Practice Committee the Association has a fit instrument for this task.

Typical agenda may cover such questions as fees for examination and report for life assurance corporations, for certain services to public authorities, for witnesses in courts, for varied forms of certificates, for the occasional treatment of certain special classes in the community, for the examina-

tion of "drunks in charge," the remuneration of ship surgeons, and so on. The committee, of course, is not preoccupied merely with fees. Such questions come before it as those relating to the appointment and powers of coroners, the forms of certificate required by Government departments or other public bodies, points arising on work undertaken for local authorities, right down to the remedy for the unattended telephone, or the doctor sign on the car, or the line to be drawn between day and night calls—small matters, some of them, but helping to smooth out the corrugations in daily practice.

Liaison

The Private Practice Committee consists of twelve elected representatives and up to three co-opted, together with one member from the General Medical Services, one from the Consultants and Specialists, and one from the Public Health Committees. This liaison between the various committees is one of the most important features in B.M.A. committee structure. The Journal Committee, for example, has representatives from the Central Ethical, the Organization, and the Science Committees. The Organization Committee includes a representative from the Colonies and Dependencies Committee, and the latter has a representative from the Organization Committee. The Private Practice Committee has representatives on the Occupational Health, Public Health, Consultants and Specialists, and Finance Committees, and on the Consultants and Specialists Committee there are representatives from four other standing committees, not to speak of others from the Specialist Group Committees.

This interlacing of representation, while it means double attendances for the members concerned, is a very necessary contrivance. The boundaries of committee work can never be exactly defined.

Origins of the Committee

The former Medico-Political Committee was the progenitor of the Private Practice Committee. The Medico-Political Committee, from the early years of this century, played a very important part in Association affairs. In that committee the first steps were taken towards putting right various inequities from which practitioners suffered, and many useful changes to the advantage of the practitioner in establishing his status and ensuring him a proper remuneration for various services were made. The term "medico-political," which equally applied to some other committees, was later dropped, and the committee became the General Practice Committee. For some years it had the advantage of having Dr. S. Wand in its chair, but when the National Health Service started he became chairman

of the General Medical Services Committee. At the same time the General Practice Committee was reborn as the Private Practice Committee, and since 1948 Dr. Ian Grant, of Glasgow, has guided its work. He has done so with a gentle and yet a firm hand, checking the unreasonable demands which are sometimes received from members outside, but standing for a proper recognition of the services which the doctor renders to the community in many directions outside the National Health Service. It is a highly interesting committee to serve, partly because of the diversity of its work. Sometimes it touches on medico-legal matters, and here it has the advantage that at least two of its present members have legal experience. During the last five years it has had many solid achievements to its credit—achievements which have eased the burden and improved the reward of many practitioners.

NEW MATERNITY BENEFITS

Cash maternity benefits under the National Insurance scheme are to be increased, and changes made in the conditions of payment, from October 26, 1953. The new maternity grant and home confinement grant will be payable for confinements which take place on or after this date; the new maternity allowance is payable for confinements which are expected on or after October 26.

Terms of Payment

The maternity grant of £4 will be increased to £9. There will be an additional new grant of £3 for home confinements. For women not employed outside their own home duties the home confinement grant of £3 will take the place of the former attendance allowance of 20s. a week for the four weeks immediately after the date of confinement. Women ordinarily working for an employer or self-employed will receive the £3 home confinement grant, and a maternity allowance of 32s. 6d. for the 18 weeks starting 11 weeks before the expected week of confinement, with additions in certain circumstances for dependants. This is instead of the present maternity allowance of 36s. a week for the 13 weeks starting six weeks before the expected week of confinement (or attendance allowance of 20s. a week for the four weeks immediately after the date of confinement).

Qualifications for Home Grant

The home confinement grant will also be awarded for confinements which take place in any other institution or accommodation, such as a private nursing-home, so long as the cost of accommodation and maintenance does not fall on public funds. Occupiers of amenity beds will not be entitled to the home confinement grant.

IRISH HEALTH BILL PASSED

On July 30 the Dail passed the Government of Eire's Health Bill by 79 votes to 40. Dr. Ryan informed the House that the Bill would cost £2,000,000 a year to implement, half the amount to be expended by local authorities and the rest by the Department.

I.M.A. Comment

Dr. P. J. Delaney, secretary of the Irish Medical Association, is reported to have stated that the association found it necessary at this juncture to remind the public that it had already expressed dissatisfaction with the principles of the Health Bill, 1952, basing its opposition on the fundamental grounds that "State medicine is bad medicine." Notwithstanding apparent modifications to the Bill during its passage through the Dail its basic structure remained the foundation stone of a system of nationalized medicine.

He added: "The association remains convinced that the solution of the needs of our health services will be found in the adoption of a system of State-aided voluntary insurance."

HOSPITAL PRIORITY FOR WAR PENSIONERS

After transfer of the functions of the Ministry of Pensions on August 31 priority will be given at all National Health Service hospitals to war pensioners needing examination or treatment as out-patients or admission as in-patients in respect of their "accepted disability"—i.e., for any condition related to the disability for which they are pensioned. This priority will be given subject only to the needs of emergency and other urgent cases which must take precedence, and hospital authorities are being asked in a Ministry circular (RHB (53) 94) to ensure that it is afforded in all cases where a condition related to an accepted disability is involved. Civilian and mercantile marine pensions will be dealt with in the same way as Service pensioners.

Ex-officer Patients

The Ministry of Pensions has hitherto provided private accommodation for ex-officers requiring in-patient treatment. In N.H.S. hospitals this will be arranged by the use of Section 4 beds, where available, subject to the overriding needs of cases urgently requiring private accommodation on medical grounds. Any charges payable for ex-officer patients will be borne by the Ministry of Health, and no charge will be made to the patient or to the Ministry of Pensions and National Insurance.

Indication of Pensioner Status

General practitioners are asked by the Ministry of Health to state clearly when referring war pensioners to hospitals in the National Health Service if the reference is in connexion with an accepted disability, so that the necessary priority may be given.

Correspondence

The Drug Bill

SIR,—Surely the time has come for us to look at the nation's drug bill under the N.H.S., with due regard to its short and economically alarming history, to certain basic principles, and to the future.

The Santa Claus beginning at least had the merit of idealism, although it was clearly doomed to suicide. The first serious amendment, popularly known as "a bob a job" (more, of course, for a rupture or varicose veins), lost the idealism without gaining in practicability.

The following are the basic facts, as I see them, which should be borne in mind. The object is to ensure that nobody is deprived of adequate medical treatment because of financial hardship. It is impossible to draw any hard-and-fast line between medical products on the one hand and toilet preparations, foodstuffs and food substitutes, and beverages on the other. It is undesirable solely for N.H.S. economy to stigmatize certain medical proprietaries as ineffectual. They may benefit the peculiar mixture of body and mind of a particular patient, and the most that an overseeing political organization should do is to refrain from subsidizing them. There is the human fact that a person values a thing and derives benefit from it to some extent proportionally to what, in a broad sense, he pays for it. Effective medical products are not commercial—that is, a rich man may wish to buy an aeroplane or television set, but not penicillin.

Instead, therefore, of this endless, hopeless, thankless task of sorting out the possibles and probables from the unlikelys and the unspeakables, would it not build for a better future if we could have, say, three big categories? (a) The really important therapeutic agents, which are made unpurchasable and are made free to all patients (N.H.S. and private) on medical prescription only. This category would be small in number, large in power, and would include the antibiotics, sulphonamides, hormones, D.D.A. scheduled

drugs, and, of course, others which would have to be decided on (by doctors, please). (b) A thorough selection (*vide supra*) of effective palliatives, made inexpensive by heavy State subsidies. This list of approved palliatives and dressings, linctuses, analgesics, laxatives, etc., would be purchasable without prescription. The patient would not buy more than he needed, he would value his medicament proportionally, and he would not have to return to his doctor each time he needed more. (c) For the remainder—the ineffective or doubtful medicaments, the "frills," for example, palatability (and surely this is advantageous only in paediatrics)—let the commercial firms compete and the laws of supply and demand operate.

Unless some such outline scheme is adopted I cannot see how it is possible to restore a sense of proportion and dignity to the medical aspect of life, which recently has been oppressed with the impracticable and sentimental idealism of "where health is concerned no expense must be spared." And who but the medical profession can enlighten the misguided, albeit well-intentioned, politicians of the true place of medicine in society?—I am, etc.,

Littlestone, Kent.

P. M. VICARY.

SIR,—We are asked to boycott so far as possible the proprietary medicines. If we do this, the drug houses will be unable to afford the employment of research chemists, and that would be a calamity. Also the patients do not believe our "But this is just as good as the medicine you are used to." Yet there is insufficient money for the present rate of prescribing to continue.

The provisions of the health scheme were never properly thought out, and it would be much more sense to change the worst parts completely than merely to modify them. In Australia life-saving drugs (insulin, penicillin, vitamin B₁₂, etc.) only are free, although pensioners have a wider range of free medicines. Anything outside these categories must be paid for by the patient. If we introduced the same scheme here, not only would the demand for unnecessary medicines be reduced, but there would probably be sufficient people who prefer medicines in elegant preparations to keep the drug houses happy. Also we would be saved the painful task of dealing with the patients who bring "grocery lists" of the purgatives, antacid preparations, etc., they say they need. Very little hardship would be caused. Those of us who do not take medicines when we have a cough get better as quickly as our patients who take pints. Persons with, say, proved bronchiectasis could be allowed extra sick benefit money to cover the cost of their B.P. cough medicines, or the chronic sick could be put into the same category as the pensioners and receive certain "non-life-saving" medicines free.

The introduction of this scheme would certainly cause an outcry, but sooner or later this will have to be faced.—I am, etc.,

Harrogate.

BETTY J. BATT.

Succession to Single-handed Practices

SIR,—The paragraph (75) of the G.M.S. Committee's report (*Supplement*, May 2, p. 159) concerned with this problem was referred back by the Conference of Local Medical Committees in June (*Supplement*, June 27, p. 293). Then, in July, the corresponding section of Council's report was also referred back by the A.R.M. (*Supplement*, July 18, p. 15). This shows that there is a large measure of disquiet with the solution which has been agreed by the Ministry, the G.M.S. Committee, and the Medical Practices Committee.

It is even more disquieting, therefore, to read that when the G.M.S. Committee came to reconsider the matter, despite long discussion, they were unable to suggest any alternative. If, despite the disapproval of both the Conference and the Representative Body of the existing scheme, the G.M.S. Committee will not take up the matter with the Medical Practices Committee, that existing scheme will remain in operation for another year, and perhaps indefinitely, if the same thing happens next year—or do the G.M.S. Committee hope that the matter will be forgotten by next summer?

I am sure that the representatives at both meetings realize the practical difficulties involved in this thorny problem, but nevertheless they could not accept, as a question of principle, the agreed scheme. Would it not be better if the wording of the relevant paragraphs were altered to this effect: "The Medical Practices Committee will normally accept the remaining partner as the successor, unless there are special circumstances which, in the opinion of the local medical committee, render such succession contrary to the best interests of the Service?"—I am, etc.,

Stevenage.

DAVID L. GULLICK.

Capitation System Unsatisfactory

SIR,—Dr. A. C. McLeish (*Supplement*, August 1, p. 71) has put a finger precisely on one of the major obstacles to the full and efficient employment of all members of the profession in general practice—the capitation system. As he so rightly points out, a doctor is paid on the number of patients he can attract, while the quality of his work goes unheeded. It is manifestly wrong that patients should have to wait one or two hours for the privilege of two minutes of the doctor's time, while hundreds of general practitioners are unable to enter practice.

There seem to me to be two possible solutions—limitation of lists, or a salaried service. I am aware that there is a nominal limitation of N.H.S. lists at present, but I do not think that a doctor can provide conscientious service for 3,500 patients all the year round even if he does nothing else, and certainly not in addition to midwifery, private work, vaccination clinics, dental anaesthetics, etc.

The second solution, supported by Dr. McLeish, is the introduction of a salaried service. I have heard various objections to this—that the doctor-patient relationship would be endangered, that freedom to choose one's doctor would be lost—but I feel the strongest reason is the conviction that the State would not pay a salary on the scale at which a full list is now paid for.

My submission, therefore, is that until general practitioners reduce their valuation of themselves the present unsatisfactory state of affairs will continue.—I am, etc.,

Petts Wood, Kent.

H. HILDITCH.

SIR,—I am writing to support the earnest plea of Dr. A. C. McLeish (*Supplement*, August 1, p. 71) that the time has come for the introduction of some form of salaried service.

A salaried service, under a corporation like the B.B.C.—that is, devoid from politics—would have many obvious advantages. It would reduce the soaring drug bill by 50% at least, if not more, if the doctor were relieved from the pressure of the exacting patient and cut-throat competition. Medical practitioners are not free agents as regards certification nowadays. Stricter certification (not under pressure) would save the country many millions, and would bring back some dignity to the profession. Nothing has contributed more to the degradation of the profession than the "easy certificate."

A salaried service would put an end to the bitterness which has torn the profession in two in recent times, and which manifested itself in the Extraordinary General Meeting. A salaried service would welcome the young practitioners, instead of exploiting them or looking on them with suspicion as potential competitors.

With a salaried service, group practice could be introduced immediately and would succeed. Group practice with doctors competing within the group will never work. A salaried service, under an independent corporation, would improve the intolerable conditions of practice nowadays, would introduce a new spirit of co-operation, and would raise the dignity of the profession.

Finally, for your information, I have never been a socialist or communist—but, in view of the fact that the Health Service has come to stay, a salaried service would be preferable from every point of view to the chaotic conditions which prevail at present.—I am, etc.,

Manchester.

B. HIRSH.

B.M.A. LIBRARY

The following books have been added to the Library:

- Pundel, J. P., and Van Meensel, F.: *Gestation et Cytologie Vaginale*. 1951.
 Rawcliffe, D. H.: *Psychology of the Occult*. 1952.
 Riehl, G., and Köpf, O.: *Die Hauttuberkulose und Ihre Therapie*. 1950.
 Riese, W.: *Conception of Disease*. 1953.
 Roback, A. A.: *Psychology of Character*. Third edition. 1952.
 Rommer, J. J.: *Sterility: its Cause and Treatment*. 1952.
 Samuel, E.: *Clinical Radiology of the Ear, Nose, and Throat*. 1952.
 Segal, M. S., and Dulfano, M. J.: *Chronic Pulmonary Emphysema*. 1953.
 Sevag, M. G.: *Immuno-catalysis and Related Fields of Bacteriology and Biochemistry*. Second edition. 1951.
 Sheldon, J. M., et al.: *Manual of Clinical Allergy*. 1953.
 Sjövall, H.: *Die Chirurgie der Poliomyelitis*. 1951.
 Sorsby, M. (Editor): *The National Health Service: a Guide for Practitioners*. 1953.
 Steel, D.: *Roentgen Anatomy*. 1951.
 Stévenin, H.: *La Médecine d'Assurance sur la Vie*. 1951.
 Watkyn-Thomas, F. W. (Editor): *Diseases of the Throat, Nose, and Ear*. 1953.
 Zinsser's *Textbook of Bacteriology*. Tenth edition by David T. Smith et al. 1952.

Association Notices

FORENSIC PATHOLOGY

Petition for the Formation of a Group

The following petition for the formation of a Group of Forensic Pathologists (specialists in forensic pathology) has been addressed to the Council.

"We, the undersigned members of the British Medical Association, engaged in the practice of forensic pathology, hereby make petition for the formation within the Association of a Group of Forensic Pathologists (specialists in forensic medicine).

"We are engaged in a branch of professional work which has always been of great importance both to the medical profession and to the public. In recent years it has become more specialized and, on account of crimes of violence and increase in litigation, plays each year a more prominent part in the security of the community as a whole. The number of pathologists practising the subject in one Division is too small adequately to represent the medico-political problems of our specialty or to advise the profession, and we are of the opinion that the formation of a group would be an advantage not only to the specialty but also to the Association. We feel that at present forensic pathology (medicine) is not adequately represented within the existing framework of the Association by the Pathologists Group, which must perforce cover the whole of that large subject; at the same time we could, as a body, assist the interests of the Association and especially of its general pathologists by reason of our particular training and experience."

- | | |
|----------------------------------|-----------------------------------|
| A. Allison (Glasgow), | John McGrath (Dublin), |
| D. F. Barrowcliff (Warwick), | J. McIver (London), |
| J. G. Benstead (Formby), | G. B. Manning (Bolton), |
| R. P. Brittain (Leeds), | A. Keith Mant (Walton-on-Thames), |
| F. E. Camps (London), | T. K. Marshall (Shipley), |
| W. F. Dorward (Dundee), | Patrick N. Meenan (Dublin), |
| W. E. D. Evans (Sutton, Surrey), | T. K. Owen (Boscombe), |
| J. S. Faulds (Carlisle), | C. J. Polson (Harrogate), |
| F. S. Fiddes (Edinburgh), | D. E. Price (Wakefield), |
| G. Forbes (Sheffield), | E. Rentoul (Renfrew), |
| C. R. E. Freezer (Pontypridd), | R. Richards (Aberdeen), |
| David H. Fulton (Peterborough), | C. Keith Simpson (London), |
| J. Glaister (Glasgow), | D. A. Slade (York), |
| G. J. Griffiths (Buxton), | F. B. Smith (Carnforth), |
| F. D. M. Hocking (Cornwall), | Sydney A. Smith (Edinburgh), |
| J. A. Imrie (Glasgow), | R. Donald Teare (London), |
| Douglas J. A. Kerr (Edinburgh), | E. Milford Ward (Leicester), |
| | C. E. M. Ware (Taunton), |
| | James M. Webster (Birmingham). |

SIR CHARLES HASTINGS CLINICAL PRIZE
ESSAY COMPETITION

The Sir Charles Hastings Clinical Prize Essay Competition was established by the Association for the Promotion of systematic observation, research, and record in general prac-

tice. The Competition has been extended by the addition of a second prize known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

- (1) The Sir Charles Hastings Clinical Prize, consisting of a certificate and 50 guineas, will be awarded for the best essay submitted.
- (2) The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and 40 guineas, will be awarded for the second best essay submitted.
- (3) Any member of the Association who is engaged in general practice is eligible to compete for these Prizes.
- (4) The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions. It is suggested that essays should consist of from 3,000 to 10,000 words.
- (5) Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1953.
- (6) A prizewinner in any year is eligible for an award of either of the prizes in any subsequent year. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work.
- (7) If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay the decision of the Council on any such point shall be final.
- (8) Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.
- (9) Each essay, which should be unsigned, must be typewritten or printed and accompanied by a note of the candidate's name and address.
- (10) Inquiries relative to the prizes should be addressed to the Secretary.

Diary of Central Meetings

SEPTEMBER

- | | |
|---------|--|
| 11 Fri. | Public Health Committee, 2 p.m. |
| 23 Wed. | Rehabilitation Committee, 10.15 a.m. |
| 23 Wed. | Arbitration Committee, 2 p.m. |
| 30 Wed. | Occupational Health Committee, 11 a.m. |

Meetings of Branches and Divisions

GLASGOW DIVISION

A meeting was held in the Glasgow Regional Office on May 29, 1953. With Dr. W. D. Anderson in the chair, there were 21 members present. Arrangements for the Annual Meeting to be held in Glasgow in 1954 were discussed. Dr. J. I. Cameron Joint General Secretary, reported considerable progress by the Arrangements Committee dealing with the scientific side of the Meeting. A draft letter was approved to be sent to members of the Division appealing for support for the Hospitality Fund and co-operation in arranging private hospitality for overseas, foreign and United Kingdom visitors.

NORTH LANCASHIRE AND WESTMORLAND BRANCH

The fourth annual meeting of the Branch was held at Blackpool on May 21, when Dr. T. S. Blackledge, of Blackpool, was installed as President for 1953-4. In his presidential address Dr. Blackledge spoke of "the show of gold" which had fallen into the lap of the general practitioner a reward not in any way undeserved and which emerged from the determination of a small compact minority of the profession to insist on the fulfilment of promises previously given. This was achieved in a manner consistent with the dignity of the profession and without holding society as a whole to ransom. O the N.H.S. Dr. Blackledge said: "There is no field in which is more incumbent upon us to remember that the price of liberty is eternal vigilance. . . . Administrative dockets and bureaucratic files can become an abomination. Medicine has a humanistic background, and one must not lose sight of the individual as such."

Dr. Ian M. Dove, of Blackpool, and Dr. J. R. Turner, of Furness Division, were elected Vice-Presidents and Dr. John Wilkie, Lancaster, was re-elected Honorary Secretary. The members were the guests of the Blackpool Division at lunch, and golf and excursions were enjoyed in the afternoon.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 22 1953

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Correspondence

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

Limited Lists

SIR,—Some of your readers, not directly concerned, may be unaware of the arrangements for payment for limited lists under the recently introduced distribution scheme.

The essential points are that loading shall not be payable, and the capitation payments shall be reduced by 20%. This figure is presumably based on a reduction of 10% as the practitioner is relieved of his liability to have persons assigned to him under the allocation scheme, and a reduction of a further 10% as the practitioner is exempted from liability of emergency calls to persons not on his list. It goes without saying that, if practitioners with limited lists were to be allowed to accept such additional responsibilities and receive the full capitation payment, they would be a great deal better off for very little additional work. To assess the total reduction at 2% rather than 20% would surely be a more accurate and realistic estimate.—I am, etc.,

I. M. BROWN.

Eastbourne.

Monthly Payment

SIR,—My partners and I have recently had to apply to our executive council for a payment on account on grounds of hardship. The nature of the hardship is one probably experienced by a great many general practitioners at the present time. The purchase of houses and cars is, in the majority of cases, made out of income. The Chancellor's policy of restricted credit, together with higher rates of interest and the diminished value of the pound, has affected all walks of life, and not least the medical man. Prior to the inception of the National Health Service, many practitioners relied upon the National Health Insurance for only a small part of their income. Nowadays the position is reversed, and in our own case 90% of our present income comes from the National Health Service.

I feel, Sir, and I am sure the majority of my colleagues agree with me, that it is time that the exceptional method of payment to general practitioners, payment at the end of each quarter, was reviewed and that a method of fact that Prime payments was devised. It is a matter of fact that Prime Ministers, Cabinet Ministers, Members of Parliament, judges, members of the armed Forces, Civil Servants, and indeed all other people whose source of income is the Exchequer, are paid by the month. University professors are, I believe, an exception to this rule among professional men.

I have it on good authority that there would be no real difficulty or expense involved in paying general practitioners monthly. It would be possible to send to each practitioner at the end of each quarter two pay warrants amounting to 30% of his previous quarter's earnings, payable on the last day of each of the following months; the balance of 40% could follow at the end of each quarter, leaving ample margin for any depreciation in his list, etc. I am also told that any representation made by the profession to the Ministry of Health would be sympathetically received.

I would be interested to read the views of my colleagues in this matter.

A RURAL PRACTITIONER.

Domiciliary Anaesthesia

SIR,—I beg to call attention to an anomaly in the N.H.S. Many dental operations are performed in the patient's own home. These fall, as a rule, into one of the following categories: (1) Cases where intratracheal anaesthesia is indicated either by the prospective duration of the operation or by the possibility of heavy bleeding. (2) Cases of cardiac or pulmonary disease which add to the anaesthetic risk. (3) Cases where the patient is extremely nervous and anaesthesia in the dental chair is not a pleasant prospect for patient or operator. It would be impracticable to deal with all these patients in hospital even if the large number of beds involved were available, because this would interfere with the patient's free choice of dentist.

In many of these cases the patient's own doctor is asked by the dentist to administer the anaesthetic. He may very well consider that he is not qualified to administer an intratracheal anaesthetic or an anaesthetic to a bad cardiac case. In this event he may call in a consultant anaesthetist to anaesthetize the patient. It appears that in such a case no domiciliary consultation fee can be claimed because "the patient is not unfit to go to hospital." The criterion of the patient's unfitness to go to hospital was laid down to prevent a consultant being called to a patient who was fit to visit him in his out-patient department, and clearly has no bearing in these cases.

I consider that this matter should be brought to the notice of the Ministry of Health and cleared up as quickly as possible.—I am, etc.,

East Boldon, Co. Durham.

M. RUSHTON.

Cost of Prescribing

SIR,—In advocating the more extended use of digitalis folia, Dr. Geoffrey Bourne (*Supplement*, July 25, p. 66) has not taken into account the ravages which time and climate can play on such a tablet. During inspections of smaller hospitals in East Africa I frequently found tablets of digitalis folia that had been on the dispensary bench for as long as 10 years. They would remain undisintegrated in

a tumbler of water overnight and appeared to be therapeutically quite inert. A well-made product of a pure glucoside such as digoxin would appear to be free from these disadvantages.

A drug which may fail to achieve its purpose is not cheap at any price. Is there not a danger that pharmacists in England, as a result of Dr. Bourne's exhortations, may be dispensing stocks of tablets of digitalis folia which have long been uncalled for, since the wider use of digoxin has been customary?—I am, etc.,

London, S.W.12.

DONALD LATHAM.

SIR,—Economy in prescribing is seemingly the burning topic of the hour and the target for attacks from Members of Parliament. With it goes the implied allegation of waste and carelessness on the part of the doctors.

Publication of the list of 650 proprietary preparations, use of which is discouraged, has received considerable publicity, and tends to create the impression that there is much room for improvement in the work of the family doctor. When one considers that of that list of 650 the majority are so obscure that neither my dispensing chemist nor I had even heard of them, it reduces itself to a farce. In actual fact, it is impossible to believe that the problem of waste is being realistically approached. No doubt a small reduction of expenditure on dispensing will follow the use of the list, but it will only be achieved by throwing the onus on the family doctor—he gets "the dirty end of the bamboo" as usual.

The situation which has arisen over dispensing can be fairly ascribed to the vapourings of politicians who flung open the chemists' shops in 1948 and encouraged the public to help themselves. Everything was to be "free"; then the bills began to come in, the chemists' profit was cut, the doctors were blamed, and the public continued to expect all their old favourite proprietaries at the new rate, free, gratis, and for nothing. Naturally they had been taught to expect them. But the one step that could be taken (and would be taken if politics had nothing to do with the matter) remains untried. So far nobody has had the courage to say to the public that a mistake was made, that after all we cannot afford to give them at State expense their favourite remedies, and that they must buy their own or accept the N.H.S. dispensing.

No attempt has yet been made to wean the public from their attitude of expectancy of "free for all and never mind the cost." The politicians started this trouble; the public cannot be blamed for swallowing their familiar ration of political half-truths, untruths, and promises that cannot be fulfilled; yet there is no particular reason why the family doctor should have the task of satisfying an insatiable demand he has not aroused. Nor is there any particular reason why he should face up to the unpleasantness of saying "No" to patients who have looked upon him as a friend rather than as a watch-dog of the Ministry.

Had the Ministry played fairly and done their part, honestly trying to re-educate the public out of their mistaken conceptions, whilst calling upon us to economize, we could have seen some sign of their sincerity. As it is, we are to take the blame for the politicians' mistakes and are expected to do their distasteful cleaning up after them. And the queer part of it all is that as a profession we do it—face our patients' disapproval on one side and veiled Ministerial threats on the other side, and do it without a murmur.

There seems nobody in the profession shrewd enough to realize the part thrust on us by the Ministry, no one wise enough to give the Ministry our assistance at the price of a ministerial campaign of public re-education, and no one with backbone enough to stand up for the family doctor in his daily tussle with an impossible job. We let the Ministry give us a bad name at the very moment when a vigorous handling of the situation would nail the blame where it belongs, and the time has come for us to declare our stand. We shall be pretty small if we don't.—I am, etc.,

carehead.

K. T. BROWN.

Sweated Doctors

SIR,—Dr. W. B. Manley's comparative analysis of various N.H.S. workers' earnings (*Supplement*, August 8, p. 75) indicates a deplorable state of affairs. When it is considered that the keep of a house officer can scarcely be less than £3 and his laundry another 10s. it will be realized how little of his £6 15s. is left at the end of each week.

I can well remember the £1 per week that I and my contemporaries received for early house jobs a quarter of a century ago. At that time the earnings of employees mentioned by Dr. Manley were actually in excess of ours. We were ridiculously docile wage slaves, most of us holding the absurd notion that a house appointment was in reality a part of our training and should be paid for accordingly. Nor is it quite fair to compare past and present. In those days it was the custom of hospitals to provide full board and lodging.—I am, etc.,

Gillingham, Dorset.

G. E. ELLIS.

Association Notices

Diary of Central Meetings

SEPTEMBER

- 9 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 2 p.m.
- 11 Fri. Public Health Committee, 2 p.m.
- 23 Wed. Rehabilitation Committee, 10.15 a.m.
- 23 Wed. Arbitration Committee, 2 p.m.
- 30 Wed. Occupational Health Committee, 11 a.m.

Meetings of Branches and Divisions

BURY DIVISION

At the annual general meeting held at the Bury General Hospital on June 22, 1953, the following officers were elected:

Chairman.—Dr. F. M. Braithwaite.
Vice-chairman.—Dr. D. Brown.
Treasurer.—Dr. J. S. B. Mackay.
Secretary.—Dr. E. Smalley.

DORSET DIVISION

A meeting was held at the Clinic, Dorchester, on June 9, 1953. With Dr. H. G. Harvey in the chair, there were 14 members present. Dr. C. Hollins gave a talk on his experiences in the Colonial Medical Service in Nigeria, with particular reference to trypanosomiasis.

SALISBURY DIVISION

The annual general meeting was held at the Salisbury Infirmary on July 17, 1953. Dr. P. Greenstreet was in the chair and 10 members were present. The following officers were elected for 1953-4:

Chairman.—Mr. A. Duff.
Vice-chairman.—Mr. Brian Reeves.
Secretary.—Dr. A. L. L. Silver.
Treasurer.—Dr. I. E. Jameson.

SUFFOLK BRANCH

The annual meeting was held at Everard's Hotel, Bury St. Edmunds, on June 18, 1953. With Dr. C. B. Bevis in the chair there were 22 members present. The following officers were elected for 1953-4:

President.—Dr. J. W. E. Cory.
Vice-president.—Dr. C. Grantham-Hill.
Immediate Past-president.—Dr. C. B. Bevis.
President-elect.—Dr. D. M. Craig.
Secretary.—Dr. W. P. Grieve.

Dr. W. Hedgcock, assistant secretary of the B.M.A., spoke on current medico-political matters.

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. Thomas Bertram Whitehead (Oldham) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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ISLE OF MAN COMMISSION ON SALARIES AND EMOLUMENTS DISCOURTEOUS TREATMENT OF B.M.A.

The Isle of Man has its own Health Service modelled on that of Britain. It is governed by the National Health Service (Isle of Man) Act, 1948. In this Act the administration of the Service is entrusted to a Health Services Board. In 1950 the Health Services Board gave an undertaking that the remuneration and terms of service of doctors would not be less than those in Britain. It was added that, at any time be less than those in Britain. It was added that, should any deviation be suggested at any time, three months' notice would be given to allow time for discussion of the proposal.

On March 31 of this year the Health Services Board notified the Isle of Man Branch of the B.M.A. (the Isle of Man Medical Society) that as from June 30—the requisite three months—it would no longer consider itself bound by the agreement on remuneration and terms of service made in 1950. This was followed by an undertaking that the Danckwerts award would be applied up to June 30, 1953, and retrospectively to 1948. There are about 30 general practitioners in the island.

Commission Appointed

The Manx Government has been perturbed for some time about the cost of its social services, particularly the Health Service, and has been looking for ways in which to economize. What payment doctors are to receive subsequent to the termination of the Government's yet to be decided, but an indication of a Commission to inquire into salaries and emoluments with the following terms of reference: "To consider how far it is equitable and in the general interest of the Isle of Man that different conditions appertaining here (with particular reference to income tax) should be taken into consideration when applying English emoluments to positions in the Isle of Man and to recommend in what way such emoluments can best be adjusted to Manx conditions." Income tax in the Isle of Man is at present considerably less than in Britain.

B.M.A.'s Action

As soon as he heard of the Commission the Secretary of the Association wrote and made an application for the B.M.A. to make oral or written representations to it. The Association's application was acknowledged on July 8 with a statement that "a further communication will be addressed

to you in due course." On July 31 a further letter was sent to the Commission asking when evidence would be required and stating that the Association could submit a memorandum in the latter part of September. On August 4 a letter was received from the Commission: "I have to request that you be so good as to forward me your Association's written representations for submission to the above-named Commission. I shall inform you later of the date when the Commission will hear your Association's oral representations."

To this the Secretary of the Association replied immediately, repeating a previous explanation of the difficulty of preparing evidence during the holiday season and asking for the latest date on which the Commission would be prepared to receive a memorandum.

There was no reply until August 12. On this day the Secretary of the Association received a letter from the Commission: "The above-named Commission has fixed Tuesday, August 18, 1953, at 2.30 p.m. as the date for hearing the oral representation of your Association. I am to point out that it would cause great inconvenience to alter this date and it would suffice if your Association's written representation could reach me not later than Monday, August 17, 1953." In spite of strong protest by telephone the Chairman of the Commission, Sir Sidney Wadsworth, refused, in a telegram received on August 13, to postpone the date. Within two days and nights the Secretary of the Association had flown to the Isle of Man for local consultations, consulted an eminent economist, and, on his return to London, had prepared a memorandum which reached Douglas on the morning of Sunday, August 16. This memorandum is printed below.

Casual Reception

At considerable inconvenience, Dr. Talbot Rogers, Chairman of the G.M.S. Committee, accompanied the Secretary on a difficult journey to appear before the Commission in Douglas on August 18. Also present were the President, Chairman of the Representative Committee, and assistant honorary secretary of the Isle of Man Branch. Their protest at the lack of courtesy and consideration shown to the Association was casually received by Sir Sidney Wadsworth, the Chairman. Equally casually he remarked that he had not read the Association's evidence, as it had come to him only a minute before. The Commission agreed to receive

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within a week or so such further evidence as the Association could provide. After 90 minutes, instead of the 30 minutes only which had been planned by the Commission, the Association's representatives withdrew. The Commission will report to the Tynwald in due course.

There are about 50 medical practitioners in the Isle of Man who may be affected by any decision on the recommendations of the Commission by the Manx Government.

MEMORANDUM OF EVIDENCE SUBMITTED TO THE COMMISSION ON SALARIES AND EMOLUMENTS, ISLE OF MAN

INTRODUCTORY

1. The British Medical Association, of which Her Majesty the Queen is Patron, is a voluntary organization of doctors with a membership, at home and overseas, of some 67,000. Its membership includes more than 80% of the doctors in active practice in the United Kingdom. Its principal objects, as defined in its Memorandum of Association, are "to promote the medical and allied sciences and to maintain the honour and interests of the medical profession."

2. The Association is the chief representative organization of the medical profession in the British Isles and has long been recognized as such by Government Departments and by many public authorities and other bodies. On very many occasions it has been specifically invited to assist Royal Commissions and departmental and interdepartmental committees by providing both written and oral evidence.

3. Through the Health Services Medical Whitley Council, the Association takes part in the negotiation of the terms and conditions of service of members of hospital medical staffs and medical officers in the public health service. The General Medical Services Committee of the Association negotiates directly with the Ministry of Health on all matters relating to the terms and conditions of service of general medical practitioners in the National Health Service, and this committee is the only body with which the Ministry enters into such negotiations. An illustration of the standing of the Association in relation to the Government is afforded by the fact that no regulation concerning the general medical services is made and no instruction issued by the Ministry of Health to local executive councils until it has first been discussed in draft form with this committee of the Association.

4. The Isle of Man Medical Society is a branch of the British Medical Association, which is therefore properly concerned with the affairs of the doctors on the island no less than with those of the doctors on the mainland.

5. The Association is grateful for the opportunity of submitting representations to the Commission on Salaries and Emoluments, but it is with regret that it finds it necessary to state that the Commission has allowed insufficient time to permit of this memorandum being produced with the care habitually given to the preparation of a document of this kind, or being placed before the Council of the Association for the customary examination and approval before presentation to the Commission. The memorandum, however, carries the authority of the Chairman of the Council. No doubt it bears the marks of hasty composition, and certainly it could with advantage have been revised and amplified had more time been available—particularly for consultation with appropriate experts. The demand of the Commission for the document to be produced and posted at three days' notice and for representatives to submit oral representations at six days' notice is an occurrence unprecedented in the Association's long experience of dealings with governmental bodies. The Association therefore asks that the present document be accepted as merely an interim statement of its views and that an opportunity be given of making additional representations to the Commission after it has been possible to secure a detailed report from an expert in economics.

REMUNERATION IN RELATION TO INCOME TAX

6. Two committees which sat under the chairmanship of Sir Will Spens were charged with the duty of considering what should be the remuneration, in a publicly organized health service, of general medical practitioners in the one case and of consultants and specialists in the other. It is on the recommendations of these committees that the payments made to general practitioners and to consultants in the National Health Service are based.

7. The two Spens Committees expressed their recommendations in terms of the value of money in the year 1939, leaving to others the task of making the necessary adjustments to take account of the changed value of money and of changes in the incomes of other professions. Neither committee suggested any adjustment related to income tax or made any reference whatsoever to variation in rates of income tax as a relevant consideration in the assessment of proper levels of remuneration. The introduction of this consideration would be a departure from the principles of the Spens Reports, which have been accepted both by the Government and by the medical profession.

8. In March, 1952, the "betterment factor" to be applied to the Spens figures for general practitioners was decided by the award of Mr. Justice Danckwerts. The method established by the Danckwerts award of determining each year the size of the fund from which the capitation payments are made to general practitioners takes account of a number of variables, but takes no account of varying rates of income tax.

A Strange Proposal

9. The budget for the financial year 1953-4 included provision for a reduction in the rate of income tax; yet no suggestion has been made that there should be a corresponding decrease in the remuneration of any section of the medical profession.

10. The Commission on Salaries and Emoluments is now asked "to consider how far it is equitable and in the general interest of the Isle of Man that different conditions appertaining here (with particular reference to income tax) should be taken into consideration when applying English emoluments to positions in the Isle of Man, and to recommend in what way such emoluments can best be adjusted to Manx conditions." Presumably the doctors working in the health services in the Isle of Man would be included among those whose remuneration would be affected by any adjustment of the kind here envisaged.

11. The British Medical Association, having no special competence outside the medical field, hesitates to pronounce on a large economic issue, but the suggestion that the remuneration of persons who are paid from public funds should be subject to increases and decreases directly related to variations in the rate of income tax appears to it at first sight to be strange and, indeed, preposterous. Is it seriously contemplated that, because the present rate of income tax payable in the Isle of Man is lower than that payable on the mainland, the doctors, for example, on the island should receive for their work in the Health Service correspondingly lower incomes than are earned by their colleagues on the mainland? If this were brought about, it would seem to follow inevitably that their remuneration would require adjustment on each and every occasion on which income tax was either raised or lowered, whether on the island or on the mainland. If, for instance, world disarmament led to a reduction of the rate of tax on the mainland from 9s. to 6s. 6d., the authorities concerned in the Isle of Man would immediately be committed to a corresponding increase in the payment of the local doctors. The Association can see no justification for any such plan of measuring remuneration by a sliding scale in accordance with varying rates of tax.

12. It is a recognized obligation of the individual citizen to contribute a fair proportion, related to the size of his income, of the funds which must be raised by direct taxation to meet the cost of services which the Government elected by the community has provided for the benefit of

the community. If the cost of these services increases, the Government may reduce the extent of the services provided and thus reduce their cost, or it may call for a larger contribution from the citizen. If it chooses the latter course, the obligation of the citizen to pay his fair share remains, although his fair share now amounts to a larger proportion of his income. There appears to be no case for him to demand a measure of exemption from this obligation in the form of a compensatory increase of pay. Indeed, financial compensation for a rise in the rate of income tax would appear to reduce the system of taxation to absurdity.

The Economic Argument

13. If there is no justification for increasing earned incomes to protect the taxpayer against an increased rate of income tax, neither is there any justification for reducing these incomes to deprive the taxpayer of the benefit of a reduced rate of income tax. In such consultations—necessarily extremely hurried in the limited time available—as the Association has been able to hold with experts in economics, it has found no support for the theory that net earned income—in the sense of the amount of earned income remaining after the deduction of income tax—should remain constant. For example, Mr. George Schwartz, who is economic adviser to Kemsley Newspapers and was formerly Lecturer in Economics in the University of London, has informed the Association that he feels certain that no reputable economist would subscribe to such an argument. In his opinion, there is not the slightest justification for adjusting the remuneration from public funds of the doctors engaged in the health services, whether on the mainland or in the Isle of Man, in accordance with differences in the rates of income tax payable locally from time to time; nor is there the slightest justification for adjusting the remuneration of the doctors on the island in accordance with a difference between the rates of tax payable on the mainland and on the island at one and the same time. Mr. Schwartz goes so far as to describe any such proposal as "indefensible, impracticable, and absurd."

14. The Association therefore submits that, so far as income tax is concerned, the adjustment of "English emoluments" to Manx conditions envisaged in the terms of reference of the Commission on Salaries and Emoluments would be wrong in principle, and that the doctors working in the health services should continue to receive consistently, year after year, the recognized "rate for the job," contributing income tax from year to year at whatever rate the central Government or the Manx Government, as the case may be, may find it necessary to levy for the time being.

15. In view of the fundamental objection in principle to the plan contemplated, it seems scarcely necessary to prolong the argument; but brief reference should perhaps be made to certain anomalies which the adoption of the plan would entail if its adoption proved practicable. There would be the grave objection that one section only of the population of the island would be prevented from earning incomes comparable with those earned in corresponding circumstances on the mainland. In effect, those residents on the island who are paid from public funds would pay the mainland rate of income tax, while a large proportion of the local population would continue to pay the lower local rate of tax. Do the Manx hotel-keepers, for instance, because of the reduced charges to visitors to the island because of the relatively low Manx income tax? Are any Manx products sold on the mainland at prices below those generally obtaining on the mainland because of the relatively low Manx income tax? Do the British banks with branch offices on the island pay their staffs at rates below their standard rates because of the relatively low Manx income tax? Does even the local Manx Bank pay its staff at rates below those of the mainland banks because of the relatively low Manx income tax? The answers to these and other similar questions are understood to be in the negative; and the Association has difficulty in understanding the equity of paying a doctor less than the rate for the job on the ground that he enjoys the

comparatively favourable local conditions in respect of tax while a bank manager, for example, receives the full rate for the job although enjoying precisely the same local conditions.

Effect on Superannuation

16. A further illustration of the injustice of the plan under consideration is evident when one considers what its effect would be on the superannuation arrangements for doctors engaged in the health services. The pension granted to the general practitioner on retirement is related to the amount of his remuneration throughout the whole period of his service. It follows that a practitioner who, after 10 or 12 years of practice on the island, decided for one reason or another to move to a practice on the mainland would eventually receive a smaller pension than would be paid to a colleague whose circumstances were identical except that he had spent the whole of his professional life on the mainland. In the case of the consultant the retirement pension is related to the remuneration earned during the final years of service. Hence a consultant who took up an appointment on the island in middle life and held this appointment until his retirement would receive a reduced pension although he might have paid the higher mainland superannuation contributions (the standard 6% of the higher mainland salary) for a considerable period.

17. It appears to the Association that, under the plan contemplated, it would be a misfortune to be engaged in work for which payment was made by the Manx Government. It is unlikely that in such circumstances the normally competent and ambitious doctor would be attracted to service on the island. The probability is that the plan would have a detrimental effect on recruitment to the Manx health services and would therefore prove injurious to the interests of the local community.

COST OF LIVING

18. It is not known what other "Manx conditions" may be under consideration by the Commission as possibly justifying an adjustment of "English emoluments"—whether, for example, comparative figures relating to the cost of living on the mainland and on the island are being studied. The Association would not accept evidence of a lower cost of living on the island as warranting an adjustment of remuneration without first considering whether this advantage was offset by disadvantages connected with the relative isolation of the island doctors.

19. In fact the Association is aware of no such evidence. On the contrary, such limited information on the subject as it has been able to acquire suggests that the contrary position may be the true one. The Association, however, would welcome an opportunity of examining any relevant statistics on which the Commission might propose to base its recommendations.

CONCLUSION

20. The Association appreciates the fact that the function of the Commission is a purely advisory one and that it would be for Tynwald to put into execution any recommendations of the Commission which it might see fit to approve. Nevertheless, it is perhaps fair to state at this stage, for the information of the Commission, that the medical profession would certainly resist to the uttermost any proposal, based on considerations of income tax, to pay the doctors on the island at lower rates than those obtaining on the mainland, and would be forced to use every legitimate means at its disposal to prevent any such proposal from being put into operation or retained in operation.

21. The Association would again ask that it may be given an opportunity of submitting further written observations should the present hastily produced memorandum fail to convince the Commission. Meantime, if the Commission is studying any other matters on which it is thought that the Association's comments might be helpful, the Association would be very glad to afford any assistance in its power.

An Association Service

THE LIBRARY

The Library of the British Medical Association is not just a collection of some 65,000 books and a turnover of 1,600 journals regularly available. It is not even a spacious building with an ample reading-room and gallery and alcoves such as the present Librarian dreams about when some additional land at the back of B.M.A. House comes into occupation. It is a functioning thing—an expert service. Its staff of 10 are trained people. Librarianship is not learned in a day or a year; it is a highly skilled job, as everyone must appreciate who has been turned loose in a library and left to find his own way about. Moreover, the B.M.A. Library is not merely a place to which people come and look at books: the mountain goes to Mahomet, it is a place from which books and periodicals go out to them.

At successive Annual Meetings, on the presentation of the report on the science activities of the Association, the chairman of the committee has always given an appreciative nod in the direction of the Library as a useful branch of the Association's work, but never, in the writer's recollection, has it evoked discussion, either in terms of criticism or praise. It is too often regarded as one of the Association's side-shows, to be taken for granted. Someone once called it a Cinderella, but if it is that poor maiden she has no time to sit over the hearth, for she has to issue 30,000 books and journals in the year for home reading, and to dispatch nearly 12,000 parcels to all parts of the kingdom.

A Dip into History

For nearly 60 years of its history the Association had no library, and it was not until 1893 that a permanent full-time librarian was appointed. Incidentally, during the 60 years since then there have been only two such officers—Mr. Spencer Honeyman, who served until 1929, and Mr. T. J. Shields, the present Librarian, who was appointed in that year. The Library has had invaluable service, however, in an honorary capacity, notably by Mr. Walter G. Spencer, who was honorary librarian from 1923–9, and a generous donor.

When the Association entered its present premises in 1925 the Library was accommodated in what is now the members' lounge and later in the north wing; a few years ago it was transferred to more commodious quarters on two floors overlooking the garden court. But its premises are less ample than its contents and service deserve. Some day, when economic circumstances permit, the Library may come into its own with increased grants and be able to perform still greater service.

Hastings Collection

Sir Charles Hastings, the founder of the Association, was a bibliophile, and some part of his collection came into the possession of the Association as late as 1926. Four years after the Association was founded there was a proposal for a Library, but it was turned down and nothing was done about it for the ensuing half century. It is rather astonishing how many people, physicians and philosophers among them, have failed to appreciate the value of a library. There was John Radcliffe who deprecated "the rubbish of antiquity contained in musty volumes" and undertook to write down all necessary medical knowledge on a sheet of paper, though, to be sure, he left £40,000 to found a library at Oxford—as though, said a wit of the time, a eunuch had left money to establish a seraglio.

But it was probably practical considerations that determined the early decision not to have a library. So long as its headquarters were at Worcester the Association had no house of its own, and long after it came to London its headquarters were little more than the editorial and publishing

offices of the *Journal*. Again, to render a library available to members scattered all over the country may well have seemed a hopeless proposition.

The First Collection

In the 'eighties Mr. Ernest Hart, then Editor of the *Journal*, in a letter to Sir Walter Foster, Chairman of Council, proposed a reading room and reference library in the new home of the Association in the Strand. Hart was the first donor and the first honorary librarian. He started the practice, which has been continued by subsequent editors, of passing on to the Library, after the reviewers had done with them, books received for review. The Library was opened to readers in 1889, when it consisted of 2,600 volumes. Within a very short space of years the number had risen to 5,000, and the material was such, said a report at the time, "as to make one believe that it may eventually become one of the best medical libraries in the country." In 1892, 2,000 visitors entered their names in the admission book at the door of the reading-room. In the following year Spencer Honeyman, who had previously assisted Hart in forming the collection, was appointed full-time librarian (hours of attendance 10 to 5), at a salary of £150—a salary raised within two or three years to £200, with an acknowledgment of the efficiency and courtesy with which he discharged his duties.

When the Association, after occupying temporary quarters during rebuilding, went back to its new premises in the Strand in 1908, the Library was given quite a handsome setting in a lofty room pillared with Spanish mahogany, and with accommodation, including storage space, for 25,000 volumes, which was twice as many as it possessed at that time. As great an authority on librarianship as Sir William Osler paid it a great tribute at the Belfast Meeting in 1909, declaring it to be one of the most valuable of modern professional libraries.

The Library was at first maintained for reference purposes; a lending service was not developed until after the first world war. In 1922 the books lent to members numbered 3,700; by 1931 the number had increased to 15,000; and by now it has more than doubled that figure. By the time of the centenary in 1932, the Library, in the meantime installed at Tavistock Square, contained 40,000 volumes, and so it has gone on growing. Last year there were 35,000 attendances and borrowings, though the figure does not include the many who drop in at the library and look up a reference without troubling to sign the admission book, nor members of the Association staff who constantly have occasion to consult the Library. It is worth noting that twice as many country members as town members use the shelves. Books and journals in current demand are issued for 14 days; others for 28 days. But the current fasciculus of any periodical cannot be loaned, and not more than two issues of a particular periodical may be borrowed at any one time. There is no charge for borrowing, except postage.

With no end, as Solomon said, to the making of books (though he was corrected by old Thomas Fuller, who said that it was of the making of foolish books there was no end), space is the librarian's nightmare. The solution to the problem may lie in the microfilm, and the books of the future may not be within covers at all, but on reels of celluloid. That is a dismal prospect, but the B.M.A. Library has already a collection of microfilm, and two microfilm "readers" are available. There is a useful liaison between the Library and other leading medical and scientific libraries whereby they supplement each other.

A Modern Library

The Association's Library is a modern one—a working one. There is, of course, a great place for a library with literary treasures and ancient books, such as the Medical Society of London possesses. But to the man in busy practice, a member of a progressive profession, who knows that he must never cease to be a student, a modern library in which not only the latest textbooks (for, as someone has

said, textbooks nowadays are out of date before they leave the press) but journals are available is essential. The library is really an extension of the medical journal, a mirror of changes in thought and practice, a record of happenings in medical centres all over the world. That is why the Association library has specialized in periodicals, of which it has now probably as good a regular service as is to be found anywhere.

Mention must be made of one collection in the Library which is believed to be unique in this country. This is the medical *Thèses de Paris* (1892 onwards) and *Thèses de Lyon* (1894–1919). When Mr. Ernest Hart was in Paris soon after 1894–1919, the Library was founded he arranged for the receipt of a complete series of these theses. In France the professors in the various medical faculties make use of such theses as the mouthpiece for the teaching in the hospitals with which they are connected. When distinguished men are candidates for hospital appointments or professorships they give proof of their attainments in these essays, and thus many of them are *thèses d'agrégation*. The value of them, of course, varies, but some are of great importance, embodying the practice and matured opinion of leading teachers in the French hospitals, and they have been often consulted at the Association Library by British authors of textbooks.

Then, of course, there are those invaluable compilations, the *Index Medicus*, the *Quarterly Cumulative Index Medicus*, the *Index Catalogue of the Library of the Surgeon-General's Office*, and the *Current List of Medical Literature*, which are available in the Library, and enable the student to thread his way through the intimidating vastness of medical periodical literature. There is no printed catalogue of the Library, but there is a card index and additions are published in the *Supplement*.^{*} Members of the Association, the Library is at your service!

THE SMALL-LIST PRACTITIONER WORKING PARTY INQUIRY

The chairman of the G.M.S. Committee told the Special Conference of Local Medical Committees and the Extraordinary General Meeting of the Association in May (Supplement, May 9, p. 206) that it had been decided to invite the full Working Party to undertake an inquiry into the difficulties of practitioners with small lists and, in the light of the facts revealed, to consider whether any modifications should be made to the existing arrangements.

List Prepared

The Working Party has now considered the sort of information which it needs to make a general analysis of the circumstances of all small-list practitioners who might be adversely affected by the new distribution arrangements, and the Ministry has prepared a list of the names of single-handed practitioners who were recorded as having lists of less than 1,200 patients on January 1, 1953.

Executive councils are being asked to supply information from their own records which will enable the Working Party to examine some aspects of the circumstances of practitioners with small lists. This data, however, will not give the Working Party the complete picture which it needs for the purposes of its survey, since a number of those concerned will have substantial professional commitments outside general practice in the National Health Service.

Questionary to Small-list Doctors

In order to complete its survey, the Working Party wishes to supplement the information provided by executive councils by some knowledge of the work doctors are undertaking outside the Service. The G.M.S. Committee is therefore sending out through local medical committees a questionnaire to practitioners with lists of not more than 1,200. These prac-

^{*}Any presentation of medical books of the 16th to 18th century would be acceptable to the Association librarian.

tioners will not be asked to disclose details of professional remuneration. The questionnaire is designed to give an indication of the amount of time which is spent by them on professional commitments both inside and outside the Health Service. The information supplied by practitioners will be used solely for the purpose of building up a broad general picture and will not in any way be used when assessing the circumstances of those practitioners in regard to any scheme which the Working Party may decide to recommend in the light of the findings of the survey. The information will be treated in the strictest confidence and will be used only to form a survey for statistical purposes for the Working Party.

The General Medical Services Committee gave an undertaking that the Working Party would consider the problem of the small-list doctors as soon as the full facts were forthcoming, and it is hoped that the completed questionnaires will be returned to the Committee by the end of October.

MEDICAL PRACTICES COMMITTEE

The following amendments to the classification of areas (June 16 to August 1, 1953) have been issued by the Medical Practices Committee:

ENGLAND: COUNTIES

- Bedfordshire.—Dunstable, Intermediate from *Designated.
- Buckinghamshire.—Bletchley, Intermediate from *Designated; Marlow, Restricted from Intermediate.
- Cumberland.—Kirkbride, Restricted from Intermediate; Whitehaven with Rowrah, Intermediate from *Designated.
- Derbyshire.—Urban District of Clowne, Intermediate from *Designated.
- Durham.—Municipal Borough of Jarrow, Urban District of Washington, Intermediate from *Designated.
- Essex.—Urban District of Billericay, Intermediate from *Designated.
- Hampshire.—Rural District of Stockbridge, Restricted from Intermediate.
- Kent and Canterbury.—Borough of Margate, Intermediate from *Designated.
- Lancashire.—Urmston, *Designated from Intermediate; Tyldesley, Intermediate from *Designated.
- London.—Borough of Camberwell: Albyn, St. John's, The Rye and Nunhead Ward, Intermediate from *Designated. Borough of Islington: Canonbury Ward, Intermediate from *Designated.
- Middlesex.—Borough of Willesden: Manor Ward, Restricted from Intermediate.
- Northumberland.—Borough of Blyth, Borough of Wallsend, Intermediate from *Designated.
- Staffordshire.—Urban District of Willenhall, Intermediate from *Designated.
- Sussex (West).—Storrington, Restricted from Intermediate.
- Yorkshire (West Riding).—Borough of Pontefract, Urban District of Castleford, Urban District of Colne Valley, Rural District of Wakefield, Intermediate from *Designated.

COUNTY BOROUGH

- Croydon.—North Parliamentary Division, Intermediate from *Designated.
- Kingston-upon-Hull.—District No. 8, Intermediate from Designated.
- Stoke-on-Trent.—Fenton and Blurton, *Designated from Intermediate.

WALES

- Caernarvonshire.—Urban District of Penmaenmawr, Intermediate from Restricted.
- Denbighshire and Flintshire.—Cefn Mawr, Intermediate from *Designated.
- Cardiff.—Whole of County Borough, Intermediate from Designated.

*Areas in which the position is finely balanced and the admission of only one or two doctors may result in reclassification.

LOAN OF PATIENTS' RECORDS TO THE MINISTRY OF PENSIONS AND NATIONAL INSURANCE

The following circular (R.H.B. (53) 93, H.M.C. (53) 87, B.G. (53) 88, dated August 11) sets out revised procedures for the loan of patients' records to the combined Ministry of Pensions and National Insurance. The procedures operate from August 31, 1953.

1. Requests for patients' records will come from medical officers of the Ministry of Pensions and National Insurance in connexion with either claims for disablement benefit under the National Insurance (Industrial Injuries) Act, 1946, or the need for determining a person's entitlement to a disability pension (war pension) and the assessment of the degree of disablement on which the amount of that pension is based. The cases concerned are those in which a patient has received hospital treatment for wounds, injuries, diseases, or mental illness which may be due to, or aggravated by, enemy action or by service in the Armed Forces, Merchant Navy, Civil Defence Force, or Women's Auxiliary Services.

2. The Ministry of Pensions and National Insurance is prepared to give an assurance in each case that the consent of the patient to the loan of his records has been given in writing.

In the case of patients at mental hospitals or hospitals approved under Section 1 of the Mental Treatment Act, 1930, or under treatment at out-patient clinics associated with these hospitals, or in the case of mental defectives, the consent should be obtained by the medical officer in charge of the case at the request of the Ministry of Pensions and National Insurance. Where the patient is "certified" or "temporary," the consent of the responsible relative should be obtained, and also that of the patient himself if in the opinion of the medical officer he is able to give consent and ought to be asked to do so. Where the patient is "voluntary" his own consent should, of course, be obtained unless he is at the time incapable of understanding what is required, when the responsible relative's consent would be sufficient. Where the patient is a mental defective the responsible relative's consent should be obtained.

3. Case papers will not be asked for unless needed. Very exceptionally papers may be needed a second time, for an appeals tribunal. Because of the statutory conditions under which a pensions appeal tribunal works it is essential that the tribunal should have access to the full information and not only to copies or extracts.

4. Case papers will be treated as confidential and will be handled only by medical officers (and their confidential lay staff), by boarding doctors and consultants, and (on appeal) by the members of the appeal tribunal. An assurance has been given that if the papers include x-ray films special care will be taken of them. The case papers or any other copies or extracts that may be made are not accessible to unauthorized persons, and are not revealed to the patient except in case of appeal, when only the portions relevant to the appeal are disclosed subject to special scrutiny to ensure that no information which may be harmful is given to him.

5. In connexion with an appeal by a war pensioner to the Pensions Appeal Tribunal a statement of the case is prepared by experienced confidential lay staff of the Ministry of Pensions and National Insurance working in close collaboration with medical officers of that department, who scrutinize all reports obtained from N.H.S. hospitals which are to be included in the statement. This statement must, legally, be made available to both sides. Where, however, the evidence includes reports which the Ministry of Pensions and National Insurance medical officers consider might cause the appellant serious anxiety or distress or retard his progress, procedures which are provided for in the pensions appeal tribunal rules are operated, as follows, so that the appellant does not see these reports. When, as is usually the case, the appellant is to be represented by some organization at the hearing of his appeal, the representative handles the statement without showing it to the appellant and treats it as strictly confidential. When the appellant does not intend to be represented at the hearing, the Ministry of Pensions and National Insurance omits the harmful reports from the copies of the statement sent to him, though not from the copies sent to the tribunal, who are informed of the omissions and the reasons.

6. In paragraph 6 of R.H.B. (53)/H.M.C. (53)/B.G. (53) boards and committees are asked to furnish treatment reports on service pension cases to the War Pensions Office of the Ministry of

Pensions and National Insurance. These reports, which are not revealed to the patient or anyone else, are required only for the clinical records of the Ministry of Pensions and National Insurance medical staff to enable them to act on recommendations from the hospital, to follow up the case, and to take such action as is indicated on the pensioner's behalf. Consequently no question of consent arises.

7. If any records of treatment of Service men, civilians, or mariners under the E.M.S. scheme before the appointed day are still held by hospitals they may on request be released to the Ministry of Pensions and National Insurance.

8. Documents, etc., when called for are needed urgently, and in the interests of the patient hospitals are asked to comply with requests as quickly as possible.

HOSPITAL MEDICAL STAFF COMMITTEES MEDICAL ADVISORY MACHINERY

General guidance on the ways in which the Minister considers that medical staff committees can most usefully be constituted and organized is given in a circular dated August 15 (R.H.B. (53) 91, B.G. (53) 85, H.M.C. (53) 87). In a circular issued to boards of governors and hospital management committees by the Ministry early in 1948 a brief reference was made to the importance which the Minister attached to the appointment by different sections of hospital staff of staff committees, not only for the purpose of watching over the interests and welfare of the staff, but also to give advice on their respective spheres of the hospital's work to the board or management committee. During the succeeding years this expression of ministerial policy has, at any rate in some quarters, tended to be overlooked or ignored.

Although the present memorandum refers specifically to groups of hospitals administered by boards of governors and hospital management committees, it stresses the desirability of having staff committees at individual hospitals, normally to include the whole senior medical and dental staff. The memorandum is not intended to interfere with the discretion of the staff in deciding itself what sort of committee it wants, but makes suggestions which the Minister thinks will enable medical committees to advise hospital authorities most effectively.

Importance of Medical Committees

The guidance given by the Minister follows prolonged discussions between the Ministry and the Joint Consultants Committee, which repeatedly emphasized the value to the Service of suitable advisory committees, truly representative of the profession, at all administrative levels. It is hoped that the circular will result in a greater measure of co-operation between hospital authorities and their medical staffs and that the former will come to look to the hospital medical committees as their regular source of professional advice.

The suggestions for medical advisory committees are not extended to regional hospital boards. The Joint Committee and the Central Consultants and Specialists Committee consider that the need for satisfactory advisory machinery is greatest at regional board level, and this view will continue to be pressed upon the Ministry.

Constitution

The Minister suggests that a group medical advisory committee should consist of up to 30 members, representing the whole consultant and specialist medical and dental staff of the hospitals concerned, the general medical and dental practitioners on the staff and in practice in the area, and the medical officers of health. The committee should meet from time to time to enable the staff to form a collective

SUPPLEMENTARY OPHTHALMIC SERVICES

DIRECTION OF PATIENTS BY GENERAL PRACTITIONERS

The Minister of Health thinks that there may have been some misunderstanding about the position where doctors recommend patients who may need glasses to particular ophthalmic medical practitioners or opticians. A circular to executive councils and ophthalmic services committees (E.C.L. 66/53) points out that the regulations contain nothing to prevent a general practitioner from giving a patient the name and address of an ophthalmic medical practitioner or optician, and there is no objection to this provided nothing is said that might seem to override the statement on Form O.S.C.1 that the patient has a free choice in selecting the person who is to test his sight.

Provision of Toughened Lenses

The Minister has decided to include toughened lenses in the range of special type glasses supplied at the applicant's own request, and towards the cost of which the applicant pays an additional charge. Charges will be the same as for laminated lenses. Toughened lenses are not available in flat form or for any concave prescriptions in which the power exceeds -6.00 dioptres.

Notes and News

Found in the Home.—Large quantities of expensive or dangerous drugs are sometimes left over when patients die or are taken to hospital. *Prescribers' Notes* for July lists the following items which were found unused in the home of a patient who had died. All were prescribed on E.C.10: 8 1-g. vials streptomycin; 22 vials "distaquaine fortified," 400,000 units; 3 vials "estopen," 500,000 units; 20 tablets penicillin, 20,000 units; 50 1-ml. ampoules "vegolysen"; 14 25-ml. vials "vegolysen"; 30 1-ml. ampoules "lytensium"; 40 hypodermic needles.

The cost to the N.H.S. for these left-overs, excluding dispensing fees and container allowances, was about £15.

National Formulary, 1954.—The Joint Formulary Committee is now revising the *National Formulary*, 1952, with a view to the publication of a further edition in the summer of 1954. It has been suggested to the committee that a special edition be published for use by prescribers and that the preparations in this edition be listed in pharmacological order instead of under the various sections, such as mixtures and injections, used in the present edition. If this proposal were adopted it is probable that the prescribers' *Formulary* would be based upon the pharmacological classification contained in the 1952 edition. Before embarking on such a radical change of policy the committee would be glad to have the comments of prescribers, which should be addressed to the Secretary of the Joint Formulary Committee, B.M.A. House, Tavistock Square, London, W.C.1.

Trainee General Practitioner Scheme.—The report of the Trainee Assistants' Subcommittee of the General Medical Services Committee on the trainee general practitioner scheme (*Supplement*, September 1, 1951, p. 92) has now been circulated by the Ministry of Health to executive councils together with the Minister's recommendation that the council should ask the augmented local medical committee to consider carefully which of the recommendations are suitable to be adopted locally. The Minister, however, makes it clear that if arrangements were made for a full-

view on all major matters of policy. A smaller executive subcommittee could meet at frequent intervals and act for the full committee, but without committing it to advice on major items of policy without taking the collective view of consultants and specialists in the group into full account. Unless the staff prefer one of their own number to act as secretary of the committee, the secretary or other senior member of the administrative staff of the board of governors or hospital management committee might, it is suggested, accept responsibility for the secretarial work of the committee—the board of governors or hospital management committee providing any clerical or other assistance required.

Functions

The object of the medical committee is to advise the hospital authority on all matters of medical policy and all medico-administrative problems, which include maintaining a continuous review of all hospital facilities in the group to ensure their most effective employment. The committee should give advice without being asked if occasion should warrant it, as well as advice on matters referred to it. The hospital authority should consult it on all appropriate matters as early as possible.

Examples given of such matters are: (a) developments in the scope of a hospital's work, such as the formation of new departments, or extensions and modifications in existing departments; (b) allocation of beds; (c) criteria to be followed in deciding upon the admission of patients on the waiting-list; (d) arrangements to be adopted for emergency admissions; (e) procedure for dealing with complaints involving medical or dental staff; (f) procedure for making appointments of junior medical or dental staff (within the framework of such central guidance as has been given—for example, in relation to registrars); (g) types of medical and dental equipment and supplies to be obtained; (h) care of medical and dental records; (i) economies to be sought both generally and in relation to such matters as prescribing, use of x-ray films, etc.; (j) control of infection in hospitals; (k) recommendations of members of the staff to serve as members of the board of governors or hospital management committee; (l) the organization of such activities as clinical demonstrations or maintenance of a medical library.

Additional Function

The Minister considers that in addition a systematic review and analysis by the committee of the clinical work of the staff would be of the greatest value, a function not usually exercised by it at present. If the results of the work of all departments were regularly reviewed and where practicable subjected to statistical analysis and brought before the full committee at its periodic meetings, discussion of the results would, in the Minister's view, assist all the staff in achieving and maintaining a high standard of clinical work. Suitable opportunity for discussion of the clinical details of cases of special interest might also be provided. No question of clinical interference in the conduct of individual cases would arise; this would remain the sole responsibility of the consultants in charge of the particular cases. The object would be discussion and review of clinical results with the object of ensuring as high a standard of medical care as possible throughout the group.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

time course in midwifery for trainee assistants, such as envisaged in paragraph 21 of the report, he could not undertake to provide additional funds for the purpose.

New National Insurance (Industrial Injuries) Act, 1953.—The Industrial Injuries scheme first came into operation on July 5, 1948. It replaced the Workmen's Compensation Act by a new system of compensation for accidents at work and for "prescribed" industrial diseases. Compensation took the form of insurance benefits. At present it can be paid only if the disablement resulting from the accident or industrial disease is assessed by a medical board as substantial (20% or more), or is likely to be permanent, or in some circumstances both substantial and permanent. Under the new Act, from August 26 the benefit may be paid wherever the disablement is assessed at 1% or more, whether it is permanent or not. This change does not affect the special rules relating to persons suffering from pneumoconiosis or byssinosis.

Questions Answered

Employment of Agent for Assistance in Tax Matters

Q.—Can I claim relief of tax on the cost of employing a chartered accountant to safeguard my interests against an erroneous claim by the income-tax authorities of underpayment of tax by me? During the years concerned my sole income arose from local government service and the Army, and deductions were made at source.

A.—The case of *Allen v. Farquharson Bros.*, which was decided in the High Court in 1932, dealt with legal rather than accountancy costs, but the judgment of Finlay J. is capable of application to this case. The learned Judge made it clear that objection would not be taken to "expenditures connected, for example, with the accounts" or to discussing them with the inspector of taxes, but he held that to be allowable the expenditure should be "made for the purpose of earning the profits of the trade." On the facts of that case it was decided that the expenditure incurred in an appeal to the Commissioners of Taxes was not incurred for purpose of earning the profits and therefore was not allowable. (Incidentally it would seem that the appeal to the Commissioners had in the main been successful.)

It is considered that the judgment referred to above gives ample support to the refusal to allow the questioner any relief for the expense incurred by him, not in the preparation of a professional account, but in the settlement of the amount of tax payable by him on an ascertained income.

Deduction for Rental Value of Premises

Q.—I do not live at my surgery, which is in a private house owned by myself. The whole house is devoted to professional purposes. Apart from the surgery and waiting-room the remainder is occupied by a housekeeper and husband who live rent-free. The net rateable value is £48. On this I pay Schedule A income tax and am allowed £48 off my income as well as £40 rates. The value of the house is £3,000, which I paid for it. I am allowed nothing for rent beyond the £48. Is this correct, or should I get a rental allowance equivalent to what I would rent this house for for professional purposes—for example, £120 per annum?

A.—It is provided by Section 136(3) of the Income Tax Act, 1952—a consolidation Act—that the deduction on account of the annual value of the premises used for the profession shall not exceed the amount of the assessment under Schedule A. In this case the limiting amount is therefore £48. This does not seem inequitable, because if the questioner could deduct £120 as being the amount of quasi-rent to be borne by the practice, then he as landlord would

have to be regarded as receiving a rent of £120; the net effect would be that his "unearned" income would be increased and his "earned" income decreased by the same amount, and that would presumably increase the tax payable by him.

Signature on International Certificates

Q.—The new form of International Certificate requires the stamp of one who is authorized to use a stamp. May a general practitioner obtain this authority? If so, to whom should one apply?

A.—The purpose of the authorizing stamp is to satisfy the overseas country concerned that the signatory to the International Certificate is a duly registered medical practitioner in Britain. In practice the stamp is issued by the medical officer of health for the area, who is not in any way countersigning the doctor's certificate. It is not possible for general practitioners to be authorized to use the stamp for the purpose of International Certificates.

Tax Liability on Retirement

Q.—I am advised that if I retire (at the age limit) during the present financial year from the regional hospital board and board of governors, I shall be liable to be assessed on my total earnings during 1953-4 for 1954-5. As my salary from the hospitals service is separate from my private practice I had imagined that my liability on this account would cease in 1954-5.

A.—It is assumed that the questioner has hitherto been assessed on the basis that the whole of his professional earnings have been regarded as coming within the scope of Schedule D—a course which is convenient both to the consultant and to the Inland Revenue, and often advantageous to the former, as it avoids the application of the stringent Schedule E rule on expenses. The view of the Revenue if the questioner gives up his appointment but continues his private practice is likely to be that he is committed to the treatment of his earnings as derived from a single source, and that the fact that that source for a particular reason has become less remunerative does not affect the application of the Schedule D basis of assessment—that is, calculation of the liability as determined by the earnings of the previous year. To counter that view the questioner would have to show that the practice after the termination of the hospital appointment was a different practice from that formerly carried on—not merely the same practice on a reduced basis of gross earnings. Success in that contention is doubtful, but it would assist if it could be shown that when the appointment was taken up the previous year's basis was not applied—that basis would of course have then operated in the questioner's favour.

Radiological Equipment

Q.—What annual depreciation is allowed by the Inland Revenue on x-ray apparatus and equipment in use in private radiological practice? Should domiciliary consultation fees be taxed under P.A.Y.E.—I have to provide my own apparatus and materials, and my accountant is of the opinion that these fees should be dealt with under Schedule D with the rest of my private practice?

A.—We are not aware of any officially approved standard rate of depreciation for x-ray apparatus, but we have known 15% (plus 4, that is, 18½%) allowed on the usual "written-down" basis. As regards smaller items of equipment, a depreciation allowance is not usually regarded as applicable, and in that case the cost of maintaining the equipment is allowable as and when the expense of repair and replacement is incurred.

The question of whether fees should be assessed under Schedule D or dealt with under the P.A.Y.E. system depends legally on whether the fees are the earnings of "employ-

ment"—if they are, then the employee is legally within the P.A.Y.E. system. But even in that case it is the approved practice of the Inland Revenue to include them in the Schedule D assessment on the practice (and of course to exclude them from the application of P.A.Y.E.) if they are a comparatively small portion of the total earnings of the practitioner. If the authorities insist on applying P.A.Y.E. then either the whole of the expenses should be deducted from the other earnings of the practice or the total amount should be divided proportionately between the two classes of earnings.

Tax Assessment on Unreceived Profits

Q.—I am asked to pay about 13s. in the £ income tax on the amount I received from the Danckwerts award for the time I was in partnership, apparently because the profits of the business in the year before I entered the practice were increased. I did not participate in these profits. Is it inevitable that I must pay this amount of tax on my share of the award?

A.—When the personnel of a partnership is altered the question whether the previous year's basis is to be applied as to a continuing partnership or whether, on the other hand, the practice is to be regarded as having ceased and recommenced—in which case the new firm will be assessed for its first year on the profits of that year—is one which is decided by the partners themselves. In this case it is assumed that they did not take action to have the cessation and commencement provisions applied as from February, 1951, and the questioner cannot now avoid the consequences that result from treatment of the firm's earnings as assessable on the previous year's basis, and therefore the bringing into the calculation of the firm's liability of the Danckwerts award as if they had been normal earnings of the firm of the years to which the award applies.

Taxation on Reprints

Q.—From time to time I publish lectures delivered before professional bodies and order reprints for distribution to various colleagues. Why should the cost of such reprints not be an allowable expense for income-tax purposes?

A.—The main difficulty in deciding the point raised is that so frequently the reasons for delivering and publishing lectures are mixed—including, for instance, a desire to advance general medical knowledge, to further a personal aim, to acquire a new and superior professional status, and (the relevant consideration for income-tax purposes) to ensure the maintenance of the lecturer's clientele and earning capacity. The argument for allowance of the printing costs is clearly stronger if the lecturer is a specialist and is dealing in that way with his specialty. One rather shrinks from using the word "advertisement" in this connexion, but that seems to be the fundamental consideration involved. In our view the questioner's prospects of appeal would not be good if he is in general practice, but might be good enough to justify an appeal to the Commissioners if he is in practice as a specialist.

Assistant with Rent-free House

Q.—In order to get a suitable full-time assistant, my partner and I had to purchase a house through a building society, which he will have rent free. Can we claim all the expenses associated with the house for income-tax purposes—that is, repayments to building society, rates and telephone, repairs and renewals?

A.—The cost of providing the accommodation—but not capital expenditure incurred in the purchase of the house—is an allowable expense in calculating the profits of the practice. As regards the payments to the building society, in so far as they consist of interest a deduction can be

claimed (as the society will account for income tax on interest), but in so far as the payments are in reduction of the loan they are "capital" sums and cannot be regarded as expenses. Payments of local rates and for the periodical telephone accounts are allowable, and in addition the amount of the assessment on which income tax is payable under Schedule A (the so-called "property tax") is also deductible as if it were rent. Repairs are allowable, provided that any expense of improving, as distinct from maintaining, the premises is excluded.

New Assistants' New Car

Q.—I start as an assistant in general practice in September. Is the set car allowance to cover all expenses, and is it tax free, or can I claim a further tax deduction in respect of a new car bought in this month?

A.—The £200 to be received for car expenses is not chargeable to tax, but will be considered by the Inland Revenue to cover wear and tear of the car as well as the running expenses. Consequently, no capital allowance can be claimed in respect of the cost of the car.

Sickness Benefits

Q.—Are sickness benefit payments liable for income tax?

A.—Sickness benefit payments are not liable to income tax. They are in fact benefits purchased by payment of premiums for which no income-tax allowance is given.

Correspondence

Succession to Single-handed Practices

SIR.—Dr. D. L. Gullick (*Supplement*, August 15, p. 79) may well be disturbed by the General Medical Services Committee's reaction to the reference back of paragraph 75 of its report (*Supplement*, May 2, p. 165), and is probably correct in his surmise that it hopes the real issue will be forgotten by next summer. His alternative suggestion, however, would not get over the objection that E.C.L. 11/53 asks local medical committees in making recommendations in respect of these practices to take into consideration matters for which they have no statutory authority, and consequently the local medical committee would not be able to plead it was performing a statutory duty if its action was subsequently questioned in a Court of Law. These and other legal objections which are supported by legal opinion caused the local medical committee of which I am a member to sponsor the reference back of paragraph 75 at the Conference of Local Medical Committees in June.

Neither the G.M.S. Committee nor the Ministry of Health seem willing to answer the questions asked them, but with hurt dignity used the old dialectic device of returning irrefutable replies to questions that have never been posed. My colleagues have for the moment confined their opposition to E.C.L. 11/53 to the legal aspects, which they consider make this letter quite impracticable and in need only of decent burial. If its sponsors will do this I do not think we will begrudge them a little harmless face-saving.

On grounds of policy also there are grave dangers in the proposals. If interference with partnership agreements in the way that is proposed is countenanced in one set of circumstances it cannot be long before the practice will spread, and soon all partnership agreements will cease to be worth the paper on which they are written. What then about the hopes of encouraging group practice and similar developments?

Once again it appears that the G.M.S. Committee has been prepared to agree to proposals aimed at remedying an

anomaly that will produce more anomalies than they remedy. They are in fact trying to work sections of the N.H.S. Act that are unworkable. The only remedy is, of course, repeal of Section 35 (Prohibition of Sale of Medical Practices) and related sections, but that is another story.—I am, etc.,

Wolverhampton.

R. S. V. MARSHALL.

** A summary of the relevant part of E.C.L. 11/53 (E.C.N. 114) will be found in the *Supplement* of March 21 (p. 77).—*Ed., B.M.J.*

B.M.A. LIBRARY

The following books have been added to the Library:

- d'Abreu, A. L.: *Practice of Thoracic Surgery*. 1953.
 Adriani, J.: *Pharmacology of Anesthetic Drugs*. Third edition. 1952.
 Akhilananda (Swami): *Mental Health and Hindu Psychology*. 1952.
 Albritton, E. C. (Editor): *Standard Values in Blood*. 1952.
 Alexander, F.: *Psychosomatic Medicine: Its Principles and Applications*. 1952.
 Alsted, G.: *Incidence of Peptic Ulcer in Denmark*. 1953.
 Arthur, J.: *Through Movement to Life: The Economic Employment of the Disabled*. 1952.
 Australia in the War of 1939-1945: *Clinical Problems of War*. By Allan S. Walker. 1952.
 Bellak, L. (Editor): *Psychology of Physical Illness: Psychiatry Applied to Medicine, Surgery, and the Specialties*. 1952.
 Bensley E. H., and Joron, G. E.: *Handbook of Treatment of Acute Poisoning*. 1953.
 Boden, E.: *Elektrokardiographie für die ärztliche Praxis*. Siebente Auflage. 1952.
 Borel, J.: *Les Psychoses Passionnelles*. 1952.
 Brailsford, J. F.: *Radiology of Bones and Joints*. Fifth edition. 1953.
 Bridgman, M.: *Collegiate Education for Nursing*. 1953.
 Bücker, J.: *Anatomie und Physiologie: Lehrbuch für ärztliches Hilfspersonal*. Siebente Auflage. 1952.
 Cantonnet, A.: *L'Ophthalmologie du Practicien*. Onzième édition. 1952.
 Catel, W.: *Die Pflege des gesunden und des kranken Kindes*. Vierte Auflage. 1952.
 Cloutier, F.: *Le Coma Post-hypoglycémique dans la Cure de Sakel*. 1952.
 Dax, E. C.: *Experimental Studies in Psychiatric Art*. 1953.
 Goldman, L. B.: *Fundamentals of Clinical Cancer*. 1953.
 Hollender, A. R. (Editor): *The Pharynx: Basic Aspects and Clinical Problems*. 1953.
 Hughes, W. F.: *Office Management of Ocular Diseases*. 1953.
 Kroger, W. S., and Freed, S. C.: *Psychosomatic Gynecology*. 1951.
 Leibowitz, S.: *Infectious Mononucleosis*. 1953.
 Loewi, O.: *From the Workshop of Discoveries*. 1953.
 Lucas, G. H. W.: *Symptoms and Treatment of Acute Poisoning*. 1953.
 MacLean, J. T.: *Acute Renal Failure*. 1952.
 Manhattan Eye, Ear, and Throat Hospital: *Nursing in Diseases of the Eye, Ear, Nose, and Throat*. Ninth edition. 1953.
 Marshall, R.: *Fifty Years on the Grosvenor Road: An Account of the Rise and Progress of the Royal Victoria Hospital, Belfast, During the Years 1903-1953*. 1953.
 Médecine et Médecins de Tunisie de 1902 à 1952. 1953.
 Modern Trends in Urology. Edited by E. W. Riches. 1953.
 Moore, F. D., and Ball, M. R.: *Metabolic Response to Surgery*. 1952.
 Munro, D.: *Treatment of Injuries to the Nervous System*. 1952.
 Mushin, W. W., and Rendell-Baker, L.: *Principles of Thoracic Anaesthesia: Past and Present*. 1953.
 New York Academy of Medicine: *Epidemiology of Health*. 1953.
 Raven, R. W.: *Handbook on Cancer for Nurses and Health Visitors*. 1953.
 Schultz, J. H.: *Das autogene Training (konzentrierte Selbstentspannung)*. Achte Auflage. 1953.
 Sheehan, H. L., and Moore, H. C.: *Renal Cortical Necrosis and the Kidney of Concealed Accidental Haemorrhage*. 1952.
 Shottowe, I.: *Clinical Psychiatry for Practitioners and Students*. 1953.
 Stodtmeister, R., and Sandkühler, S.: *Osteosklerose und Knochenmarkfibrose*. 1953.
 Talbott, J. H.: *Gout and Gouty Arthritis*. 1953.
 Tarsy, J. M.: *Pain Syndromes and their Treatment*. 1953.
 Thorek, P.: *Diseases of the Esophagus*. 1952.
 Watson, Sir M.: *African Highway: The Battle for Health in Central Africa*. 1953.
 Wiederherstellungschirurgie und Traumatologie. Jahrbuch. Bd. I. 1953.
 Willis, R. A.: *Pathology of Tumours*. Second edition. 1953.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Major D. B. Watson, M.B.E., has retired with a gratuity.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Major-General R. E. Barnsley, C.B., M.C., whose tenure has expired, has relinquished his appointment as Honorary Colonel of a T.A. unit.
 Captain A. J. Bathurst has been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonels A. McK. Reid, M.C., T.D., J. M. Smellie, O.B.E., Lieutenant-Colonel (Honorary Colonel) J. H. Donnelly, T.D., Major (Honorary Colonel) W. R. Martine, O.B.E., T.D., Majors (Honorary Lieutenant-Colonels) L. B. Cole, E. Hutcheon, O.B.E., T.D., R. Ropner, T.D., C. L. Broomhead, T.D., J. O. Moffat, T.D., Major C. M. Willcox, T.D., and Captains (Honorary Majors) R. S. Turner, L. A. Ogg, and W. B. R. Monteith, having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O.
 Major C. J. Cobbe, M.B.E., from Active List, to be Major.
 Lieutenant (War Substantive Captain) C. Stewart, having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., and has been granted the honorary rank of Major.

ROYAL AIR FORCE

Air Vice-Marshal (Acting Air Marshal) J. MacC. Kilpatrick, K.B.E., C.B., Q.H.P., to be Air Marshal.
 Air Commodore (Acting Air Vice-Marshal) R. H. Stanbridge, O.B.E., Q.H.P., to be Air Vice-Marshal.
 Group Captain G. W. McAleer to be Air Commodore.
 Wing Commander A. M. Weston to be Group Captain.
 Squadron Leaders J. J. McNair, F. N. Shuttleworth, G. H. Dhenin, G.M., T. J. G. Price, and J. E. Malcolm to be Wing Commanders.
 Flight Lieutenants D. G. Jones, J. A. B. Mounsey, S. C. Rexford-Welch, A. Klidjian, and J. A. Cooney to be Squadron Leaders.
 Flight Lieutenants M. T. F. Carpendale, J. F. B. Hird, and M. A. Heasman have reverted to the Reserve, retaining the rank of Squadron Leader.

ROYAL AUXILIARY AIR FORCE

Flight Lieutenant L. A. S. White to be Squadron Leader.
 E. R. Spicer to be Squadron Leader.

ROYAL AIR FORCE VOLUNTEER RESERVE

Squadron Leader M. M. Brown has relinquished his commission on appointment to the R.N.V.R.
 Squadron Leader H. G. Vyse has relinquished his commission on appointment to the Army Emergency Reserve of Officers.
 Flight Lieutenants E. B. Rayner, R. T. H. James, E. R. Spicer, and W. P. Hedgcock to be Squadron Leaders.

ROYAL AIR FORCE RESERVE OF OFFICERS

Flight Lieutenant H. S. Samuel to be Squadron Leader.

Association Notices

Diary of Central Meetings

SEPTEMBER

- 9 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 2 p.m.
 11 Fri. Public Health Committee, 2 p.m.
 17 Thurs. General Medical Services Committee, 10.30 a.m.
 23 Wed. Rehabilitation Committee, 10.15 a.m.
 23 Wed. Arbitration Committee, 2 p.m.
 30 Wed. Occupational Health Committee, 11 a.m.

OCTOBER

- 14 Wed. Physical Medicine Group, 2 p.m.

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PROGRESS IN AUSTRALIAN NATIONAL HEALTH

SIR EARLE PAGE ADDRESSES W.M.A.

On Wednesday last Sir Earle Page, the Minister for Health of the Commonwealth of Australia, in an address to the assembly of the World Medical Association at the Hague described the progress that had been made with the national health measures in Australia. At present many of the health services provided are subject to regulations. A National Health Bill will be introduced to the Commonwealth Parliament during the coming session. This Bill will aim at consolidating under one heading the various medical services carried out by the Federal Government.

Political Issues

Health schemes have been big political issues in Australia since the Federal Government was given full control of the social services at a referendum held in 1946. For three years after 1946 the Labour Government tried to get a health plan into action, but could not do so because of the objections of the British Medical Association to certain sections of the plan. But since 1949, when the present Liberal and Country Party Government came into office, Sir Earle Page, himself a doctor, has been working on a plan which involves some contribution by the people. This is the one which he will bring before Parliament. The whole range of the scheme was set out to the British Commonwealth Medical Congress in Brisbane in May, 1950, and gained the approval of the medical profession. The following is a summary of the account which Sir Earle Page gave of his plan to the World Medical Association.

Gradual Stages

The existing health provisions have been brought in gradually. In July, 1950, generous tuberculosis allowances were given to ensure that infectious patients would offer themselves for treatment in the knowledge that their homes would be able to be maintained. Mass radiography of the population was simultaneously carried out. In August, 1950, life-saving and disease-preventing drugs were made available free to the public on a doctor's prescription, and in December the Commonwealth Parliament passed an Act to inaugurate a free milk scheme for school-children under 13 years of age. In January, 1951, the Hospitals Benefits Insurance Scheme, based on a system of governmental aid to voluntary insurance, was offered to the Australian States. The following February saw the inauguration, for the first time in Australia, of free medical treatment for pensioners, and in May arrangements were made for pensioners to receive free medicines on a doctor's prescription. A Medical Benefits Scheme began to operate in July, 1953. Under this scheme the Commonwealth Government encourages voluntary insurance through approved organizations towards prepaid medical care by making available, throughout Australia, a

flat, uniform contribution for 600 medical and surgical services, on condition that the insurance organizations at least match the Government's contribution.

Government's Motives

The considerations which influenced the Australian Government in deciding upon its scheme of State-subsidized voluntary medical and hospital insurance are given in the following quotation from Sir Earle Page's address to the World Medical Association: "The most immediate problem exercising the minds of the public generally is how the advantages of modern medical science may be brought within the pecuniary reach of the people at large. The most crucial problem facing the medical profession is how can progressive improvement in the standards of treatment and practice of medicine (which are largely responsible for increased costs) be maintained at the same time as they are brought within the means of the people."

"The Australian Government does not believe that either or both of these problems can be solved by Government direction and action alone. The Australian Government believes, however, that a partnership of the medical profession, the community, insurance organizations, and the Government can evolve a method of retaining all the existing traditions and advances on the medical side and still bring the cost of a first-rate medical service within the means of the people."

Government Action

The Government has endeavoured to establish a partnership between the Government and the individual through the union of Governmental aid with voluntary effort. This partnership is, in its view, a recognition that both State and individual have obligations in a national health scheme, and that both will benefit by it. The individual will gain better health, longer life, and an easier mind about the expense of sickness; the State will gain more efficient production, greater national income, and social stability. The cost is distributed between the Government and the voluntary societies. Under this system the Government has strict control over its own costs. The patient and doctor both have a definite interest in preventing waste and abuse of time, skill, medicine, and equipment.

Grants-in-Aid

Preventive measures in Australia have been undertaken wholly by the Government because it felt that the resulting community gain might be as great as or greater than the individual benefit.

In the field of medical and hospital benefits, in which it feels that the individual gain is undoubtedly the greater, the Government's view is that this field should be covered by a system of prepaid voluntary insurance, operated by voluntary non-profit-making organizations experienced in that particular field. To encourage the development of such organizations and to make the benefits attractive to their members, the Australian Government makes available

substantial grants-in-aid. The Government believes that a wide extension of voluntary insurance to the community as a whole, and especially to the self-employed and rural elements in the community, can be secured by a basic grant of Governmental aid towards extending the actuarial benefits beyond those possible under existing insurance schemes. Insurance is thereby made so attractive as to induce many people to seek insurance cover without great expenditure, especially as members' dependants are also covered.

This grant-in-aid is given only if participating insurance organizations at least match the Governmental grant for each item of medical treatment. The Government grant, plus an equivalent amount of insured benefit, meets the major proportion of the fees charged to the lower-income groups. Higher-income groups can insure themselves for greater benefits, rendered more valuable by the existence of the Governmental grant. There is no direct connexion between the Government and the medical profession. The Government does not fix fees, which are left to the discretion and judgment of the profession itself.

Conditions of Payment

The Australian plan makes available to the patient, through his insurance organization, the appropriate amount of Governmental subsidy, even where the organization is precluded from paying a benefit under its own rules. In a number of circumstances an insurance organization in Australia, because of actuarial consideration, does not pay a benefit to its members. For instance, there is the condition that a member must go through a probationary period, usually two months in ordinary cases, and nine or ten months before confinement benefit is payable. Most organizations have a maximum amount which can be drawn on their funds during a year, and will not pay benefits for treatment symptoms of which were in evidence at the time of joining. In all these cases the Governmental subsidy is available. A man might become a member of an insurance organization on his way to the doctor and be eligible for the Governmental grant.

Hospital Benefits

Application of the principle of prepaid voluntary insurance backed by Governmental aid has already had results in Australia. Hospital revenues and patients' charges have been assisted by the Government's insurance scheme. Many hospitals showing a debt a year ago are already showing a surplus, and the total increase in hospital revenues over Australia is several million pounds. The total Federal Government subsidy is 12s. a day to any hospital patient who also insures for a minimum hospital fund benefit. In practice many patients insure for larger insurance organization benefits which, together with the Government grant, approximate to actual hospital costs.

As in the medical benefits plan, the Governmental grant is available to insured persons where actuarial considerations preclude the societies from paying benefits from their own funds.

Administration

The Government rejected the idea of a massive Governmental organization to control the insurance scheme, because, apart from the expense, it considered that such a scheme would not accord with the history of voluntary participation and organization of people for their mutual benefit. It thought that it would crush that spirit which caused people to unite voluntarily amongst themselves for mutual help and assistance. Already many large friendly society benefit funds and community hospital benefit funds are operating, as well as funds controlled by trade unions.

Extent of Cover

In its scheme the Australian Government has taken special care to give what it considers to be the widest possible health cover to the Australian people in the following ways: (1) It has provided a general-practitioner free medical service with free medicines to the pensioner group—that is, all persons or their dependants who are in receipt of an age,

invalid, or widow's pension, a Service pension under the Repatriation Act (but not a war pension), or an allowance under the Tuberculosis Act. War pensions are provided under the Repatriation Act. (2) Consideration is being given to the question of insuring at reasonable rates dependants of active service men and of war veterans who are not entitled to medical treatment under the Repatriation Act. (3) Special arrangements are made for the completely indigent. (4) Commonwealth benefits for hospital and medical care are payable as soon as patients are insured, without any waiting period that may be a condition of the insurance organization's rules. (5) Government medical and hospital benefits are given to insured patients both for chronic and for pre-existing diseases, even if benefit for these sicknesses is not given by the insurance organizations. The effect of this latter condition is to make voluntary insurance attractive. (6) The liberal Governmental grant will enable insurance organizations to review their previous exclusion conditions.

Professional Discipline

A committee of inquiry is set up through the recognized organization of the profession—the British Medical Association. This committee reports and recommends methods of dealing with the infringement of professional practice, ethics, or fraud associated with the action. It recommends the appropriate penalty to the Minister for Health, who decides what action should be taken by law or otherwise.

Professional Co-operation

Australia has developed Federal organization of its medical and pharmaceutical professions. There is a Federal Council, formed by election by State Councils from each State. The State Councils are based on regional organizations, and the individual members of the organizations elect their representatives. Close contacts are maintained between all the tiers in the organization, and it is possible to get representative opinion on all vital matters in a reasonable time. The Federal Government deals exclusively with the Federal Councils. The Royal Australasian Colleges of Physicians and Surgeons have delegated discussions on political and financial matters to the Federal Council of the British Medical Association, so that only one medical voice speaks on this matter to the Government.

Advisory Drug Panel

To determine what drugs should actually be on the free list the Australian Government invited the Federal Council of the British Medical Association and the Federal Pharmaceutical Guild to nominate a panel of specialist physicians and pharmacological experts from which an advisory council was drawn. The Bill states that this committee shall make recommendations to the Minister from time to time as to the drugs and medicinal preparations which it considers should be made available as pharmaceutical benefits, and shall advise the Minister upon any other matter concerning their operation referred to it by the Minister.

Examples of Benefits

The following table gives examples of medical benefits:

	Commonwealth Benefit	Fund Benefit at least	Total Benefit at least
	£ s. d.	£ s. d.	£ s. d.
Surgery consultation — general practitioner	0 6 0	0 6 0	0 12 0
Appendix operation	5 12 6	5 12 6	11 5 0
Tonsils (adult)	3 0 0	3 0 0	6 0 0
Tonsils (child)	1 17 6	1 17 6	3 15 0
Midwifery	3 15 0	3 15 0	7 10 0

The average cost of insurance for medical benefit for a man and his dependants is 2s. a week.

Commonwealth benefits to members of insurance organizations of £4 4s. a week are uniform over the whole continent. The organization benefits vary according to the rates of contribution. In some cases they provide sufficient to meet the hospital charges in the particular State, but they

must provide at least 6s. a day. This, with the Government benefit, makes a total of at least £6 6s. a week. An insurance organization benefit of 12s. a day can be obtained in most States for a contribution of 1s. a week. A larger or smaller benefit can be obtained for a correspondingly higher or lower contribution.

Additional Information

The Commonwealth population is given as 8,538,936. There are about 9,000 doctors. The annual cost of the Government subsidy to the Medical Benefit Scheme is £10m. and to the Hospital Benefit Scheme £12m. Except those which are private, hospitals are administered by the State Governments and not the Federal Government. Any doctor can participate in the Medical Benefit Scheme or the Pensioners Scheme. The free medicines available to pensioners are the scheduled life-saving drugs plus—broadly—those in the B.P.

About 55% of the people are voluntarily insured; 10% are covered by the Pensioners Scheme and 5% by the War Pensions Scheme; 3-4% are indigent and specially provided for. Thus nearly 75% of the population benefit from health schemes.

APPEALS MACHINERY IN NORTHERN IRELAND

DISCUSSION WITH THE MINISTER OF HEALTH

The Minister of Health of Northern Ireland, Dame Dehra Parker, accompanied by officials of the Ministry, recently received a deputation from the British Medical Association to discuss recommendations for the setting up of an appeals machinery for the profession in Northern Ireland similar to that now working in this country and to which differences could be referred. The deputation was led by Dr. Kenneth Cowan, chairman of the Association's Public Health Committee, who was accompanied by Dr. J. B. Young (president of the Northern Ireland Branch), Dr. N. S. Dickson (member of Council), Dr. Robert Marshall (chairman of the Northern Ireland Consultants and Specialists Committee), Dr. J. McKinney (representing the public health service medical officers, Northern Ireland), Dr. J. W. Chapman (assistant branch secretary), and Dr. A. V. Kelyack (assistant secretary, B.M.A.).

The principles of an appeals machinery were fully discussed, and the Minister expressed her interest and sympathy on certain points, though in doing so she was doubtful as to the need for such an appeals committee as was suggested, and asked for any example in Northern Ireland which might have been dealt with had such machinery been available.

The long-standing difference regarding the status and remuneration of the divisional medical officers employed in County Down was then discussed, not only with reference to the main issue of appeals machinery but also as an individual problem. The Minister was informed that the Council of the Association had already decided that the only solution of the difference was to refer the matter for independent arbitration, but in view of the meeting with her and in the hope that agreement could be reached, action to refer the matter under the Conditions of Employment and National Arbitration Order, 1940, had been deferred.

After a very full discussion the Minister promised to consider carefully the suggestions for a Northern Ireland appeals committee as put forward by the Association.

County Down Dispute to go to Arbitration

Further consideration has now been given to this matter, and in accordance with the decision of Council the Ministry of Health has been informed that the Association's solicitors are being instructed to take the necessary action on behalf of the five medical officers employed as divisional medical officers by the County Down health committee, to ensure that the difference regarding their status and remuneration is referred for independent arbitration.

ISLE OF MAN COMMISSION ON SALARIES AND EMOLUMENTS

ASSOCIATION'S SUPPLEMENTARY MEMORANDUM OF EVIDENCE

Prefatory Note

When representatives of the Association appeared before the Commission on August 18, the Chairman of the Commission stated that the Commission would be glad to receive any additional written evidence which the Association might be able to submit within a week (approximately). The Chairman was understood to say that the Commission would be interested to see any figures relating to comparative costs of living in the Isle of Man and on the mainland. The Chairman also indicated that he would welcome some further explanation of the statement by Mr. George Schwartz, quoted in paragraph 13 of the Association's original memorandum, that the proposal to adjust remuneration in accordance with varying rates of income tax was "indefensible, impracticable, and absurd."

The Association is advised that the suggestion of compiling, within the time allowed by the Commission, statistics showing the cost of living of doctors on the island as compared with the corresponding cost on the mainland is entirely impracticable. The Association has pleasure, however, in submitting a short explanatory memorandum which Mr. George Schwartz has most kindly composed at very short notice, and at considerable personal inconvenience. This memorandum is quoted below.

Memorandum by Mr. George Schwartz

1. The proposal to vary remuneration in accordance with the rate of income tax implies that income tax is a separate item in the cost of living. It is not. Income tax does not raise or lower either the cost of living or the standard of living. It alters the composition of both, but does not affect their magnitude. Income tax involves a reshuffle of the community's purchasing power and does not *per se* alter the volume of it. It does not therefore affect the general level of prices and incomes in the community. The citizenry redistributes it on behalf of the State, which thereupon, the result are no different from those which occur when a husband hands over housekeeping money to his wife. This doesn't raise the cost of living or the standard of living of the household. It is no answer to say that if the husband not take it out on his meals the household must suffer a corresponding reduction of other welfare.

2. This household analogy shows the fallacy of treating income tax as an item in the cost of living, and the double reckoning involved in the process. Suppose the price of carpets went up. This admittedly would entail a rise in the cost of living. Suppose an employee proceeded to argue: "Not only has the price of carpets gone up, but I have to give my wife more housekeeping money because of that. I want two increases in my salary, one to compensate for the rise in the price of carpets and one to offset the increase in the housekeeping allowance." It would be a very unsophisticated employer who was taken in by this double reckoning. And it would be a very unsophisticated employee who took a double cut in his salary, one because the price of carpets had fallen and the other because he thereby handed over less to his wife.

3. If remuneration really fluctuates with changes in the rate of income tax why does anyone grumble about the tax? An economic paradise would be a country in which with any increase in taxation the citizen was given additional income in order to pay the tax. Attempts have been made in some countries to achieve this paradise. What is achieved is inflation and currency disorder.

4. That prices and remuneration are determined quite independently of the local rate of income tax is clearly evident in the case of international commodities. Tin is

produced in Bolivia, Burma, Malaya, Indonesia, Nigeria, and Siam. Whatever the local rate of income tax, tin sells to-day at £600 per ton, and the income of tin-producers everywhere derives from that. In 1951 tin sold at one time at £1,620 per ton and in the same year at £805 per ton. What had these fluctuations to do with local rates of income tax? If lead, zinc, and copper were still mined in the Isle of Man the producers' incomes would be determined by the prices quoted on the leading metal exchanges, regardless of the rate of tax in the Isle of Man. Does a novelist living on the island get and accept a lower rate of royalties than authors on the mainland? Do investors get lower rates of dividend? Are interest rates lower because of the lower rate of tax?

5. The Health Services themselves provide a clinching refutation of the whole argument. Suppose the National Health Scheme was abolished in Britain. This would permit a reduction of the income tax by about 2s. in the £. On the thesis under discussion all salaries and wages could and should be reduced correspondingly. The citizen would then pay for medical service out of his own pocket. This trick can be performed only in public houses, and is known as "ringing the changes."

Heard at Friends House

A Well-organized Conference

During the whole of last week Friends House in Euston Road was thronged with delegates to the First World Conference on Medical Education. A journalist who has attended international conferences—not medical ones alone—in many capitals remarked that this conference was far and away the best organized in his experience. The system of earphones and simultaneous interpretation enabled those present to hear every man in his own tongue—at least if that tongue was English, French, or Spanish. But, the really excellent interpretations apart, the system of earphones at every seat in the four halls magnified the speaking to such perfection that even the whisperers and mumblers got the hearing they hardly deserved.

A Few Figures

Fully 80% of the speaking at the conference was in English, yet not much more than half the speakers were from the British Commonwealth or the United States. The number of announced papers and addresses (apart from contributions in the open discussions) was 153, and the proceedings were recorded on 200,000 ft. of magnetic wire. Talking of tape recorders, one speaker in the Section of Social Medicine mentioned that he took recordings of interviews between his patients and an experienced social worker, which proved very useful when replayed to him while he was considering the case. On one busy morning a patient was admitted, and he took her into the next room and asked her to talk to his tape recorder while he attended to other patients. Presently, going out to lunch, he found this patient at an adjoining table. On asking her what had happened she said, "Oh, I left my tape recorder talking to your tape recorder."

Points of View

In Section A, after the reading of an opening paper, another member got up and vigorously attacked it, whereupon he was joined by the "author" of the paper, who criticized it with equal vigour. It turned out that the paper, although he had read it as in duty bound, had been written by somebody else.

A professor from Uganda, who is also the head of the library of his school, surprised a section by remarking, "Nothing gives me greater pleasure than to find a student asleep in the library. It is true that he is not absorbing much learning, but at least when he wakes up he is in the right environment." This speaker pleaded for school libraries with deep comfortable easy chairs and a supply of works other than medical.

Another unusual method was mentioned by a teacher of medicine from Trinidad who had introduced his students to the study of vital statistics by encouraging them to play bridge and other games of chance and to study football pool coupons. To make them acquainted with the elementary facts of epidemiology he sent them to mingle with the crowds at football matches. There they learned that sickness might be a collective as well as an individual matter.

An Australian member told of a placard which he saw in a medical school: "The student retains 10% of what he hears, 20% of what he reads, 50% of what he sees, and 90% of what he does."

A professor of bacteriology at a London school: "The clinical teacher is the students' hero. I bring him in whenever I can. The students are far more likely to listen to him than to me."

A senior teacher at a London school: "I tried to find out from our students what they thought of the teaching at Hospital. They are a pretty bright lot. They found that the senior men were better than the registrars; the latter knew too much from textbooks, whereas we old fellows, educated in medicine 30 years ago, have forgotten all those details and keep more to general principles."

Correspondence

Isle of Man Commission on Salaries

SIR,—I should like to offer my hearty congratulations to our secretary for the fine bit of work he did in the Isle of Man. After the exhausting labours of an Annual Meeting this emergency must have put a great strain on Dr. Macrae. He rose to it nobly. I particularly admired the touch of righteous indignation he put into his memorandum (*Supplement*, August 29, p. 84).—I am, etc.,

London, S.W.7.

ALFRED COX.

Cost of Prescribing

SIR,—In reply to Dr. Donald Latham (*Supplement*, August 22, p. 81), the tablet of digitalis folia is not the only one which would not stand 10 years' exposure to a tropical climate without being used. My remarks, of course, have reference to the use of digitalis preparations in this country. It is quite possible that in certain English seaside areas the tablets would not keep well, but the obvious solution is to be found in using them regularly so that they are not kept too long in stock. It is surely advisable to use a cheap drug rather than a 10 times more expensive one, when the cheap drug is as efficient for maintenance purposes. After all, we are all taxpayers.—I am, etc.,

London, N.W.1.

GEOFFREY BOURNE.

Association Notices

Diary of Central Meetings

SEPTEMBER	
9 Wed.	Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 2 p.m.
11 Fri.	Public Health Committee, 2 p.m.
17 Thurs.	General Medical Services Committee, 10.30 a.m.
23 Wed.	Rehabilitation Committee, 10.15 a.m.
23 Wed.	Arbitration Committee, 2 p.m.
29 Tues.	Grants Subcommittee, Organization Committee, 2 p.m.
30 Wed.	Occupational Health Committee, 11 a.m.
OCTOBER	
14 Wed.	Physical Medicine Group, 2 p.m.
23 Fri.	Library Subcommittee, Science Committee, 11.30 a.m. (postponed from September 25).
23 Fri.	Science Committee, 2 p.m. (postponed from September 25).

Branch and Division Meetings to be Held

MARYLEBONE DIVISION.—At Medical Society of London, 11, Chandos Street, W., Thursday, September 10, 8.30 p.m. Report of Representatives on A.R.M., Cardiff.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 26 1953

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A REVIEW OF GENERAL PRACTICE, 1951-2

REPORT OF THE GENERAL PRACTICE REVIEW COMMITTEE

From time to time the Council of the British Medical Association appoints special committees, the reports of which are subsequently "ordered by the Council to be printed." This does not mean that such reports have been subjected to detailed scrutiny and revision by the Council and are to be regarded as representing its views on the matters with which they deal. What is meant is that the Council, having received a report of an expert committee, has deemed it worthy of publication as a record of the findings and recommendations of a group of persons chosen because of their special competence in a particular field. The present report is not a report of the Council. It is a report "ordered by the Council of the Association acknowledges with gratitude the laborious work of the committee which drew it up. The Council of the Association acknowledges with gratitude the laborious and enthusiastic work of the chairman, members, and staff of the committee responsible for this report, and the sincere and illuminating account written by Dr. Stephen Hadfield of the personal investigation which he conducted.

E. A. GREGG,

Chairman of Council.

INTRODUCTION

In the summer of 1950, when the National Health Service had been in operation for two years and the British Medical Association's report on "General Practice and the Training of the General Practitioner" had just been published, the Council decided that an authoritative review of the actual conditions of general practice should be undertaken. For this purpose it appointed a Special Committee "to review the present position in general practice, its difficulties and its trends, both generally and with reference to the two years' experience of the National Health Service Acts, and to the B.M.A. report on 'General Practice and the Training of the General Practitioner,' and to make recommendations." The membership of the Committee is shown on the following page.

The Committee's preliminary discussions showed that, if the results of its review were to have significant value, it must make its inquiries on a large scale, and, further, that it must seek its information from general practitioners themselves—from the men and women in practice whose voices might not otherwise be heard. The Committee accordingly decided to invite assistance in its task from the whole body of general-practitioner principals in the National Health Service and in private practice.

On the advice of Professor A. Bradford Hill, of the Department of Medical Statistics at the London School

of Hygiene and Tropical Medicine, a small sample of general-practitioner principals was drawn at random for a field survey, and the remainder, divided into groups of 500, were communicated with by post. The table printed on the next page shows the classification of general-practitioner principals by age and type of practice. The Committee is very grateful for Professor Bradford Hill's help in the initial sampling procedures.

The practitioners who came into the field survey were visited personally by Dr. Stephen Hadfield, an Assistant Secretary of the Association who had been in general practice until 1948, and these provided material for an objective detailed study of a small number of practices. Dr. Hadfield's survey is published in the opening pages of this week's *Journal*. From the results of the postal inquiry (see *Supplement*, p. 105) there has been obtained a broad, though subjective, picture of the views of the general body of practitioners. The preparation of the questions put to the general practitioners and the interpretation of the results of the inquiry were the concern of the Committee itself.

It will be seen from the reports of the field survey and of the postal inquiry that the Committee covered a wide range of topics to ensure that its review was complete. On the whole the verdicts of both reports agree fairly well, though there are certain discrepancies. On some topics the investigator was able by personal questioning to obtain a more precise answer, while the replies to the postal inquiry must bear a broader interpretation. More-

Analysis of N.H.S. General-practitioner Principals

Total No. of N.H.S. Principals ..	17,916
No. selected for visits (with reserves) ..	390
No. invited to answer Postal Inquiry ..	17,657
Total response to Postal Inquiry ..	12,657 (72%)

Class No.	Description		Total		Field Survey (Practitioners Visited)		Postal Inquiry (Practitioners Replying)	
	Age Group	Practice	No.	%	No.	%	No.	%
1	25-39	Urban single-handed	1,477	8	12	6	862	7
2	40-59	" "	3,845	21	32	17	2,507	20
3	60 and over	" "	1,116	6	10	5	699	6
4	25-39	Urban partnership	2,451	14	32	17	1,582	12
5	40-59	" "	3,327	19	34	18	2,401	19
6	60 and over	" "	668	4	9	5	447	4
7	25-39	Rural single-handed	493	3	7	4	364	3
8	40-59	" "	1,298	7	16	8	1,027	8
9	60 and over	" "	361	2	3	2	272	2
10	25-39	Rural partnership	1,060	6	7	4	899	7
11	40-59	" "	1,494	8	17	9	1,320	10
12	60 and over	" "	326	2	9	5	277	2
		Totals ..	17,916	100	188	100	12,657	100

over, the field survey was objective, while the replies to the postal inquiry are subjective and more coloured by personal views, or even by the doctor's mood when he gave his answer. In reviewing the reports the Committee has been careful to avoid the conclusion that because a majority make no complaints on a particular matter all is well. The nature of complaints made by a minority has been carefully studied, in case the absence of complaint by the majority indicates an uncritical acceptance of a position which examination proves to be contrary to the interests of good medicine.

Having considered the two reports and other evidence, the Committee submits its own observations and recommendations (see *Supplement*, p. 131). In general, its object has been to compare the conditions and standards of general practice at the present time with the ideas set out in the Association's report on "General Practice and the Training of the General Practitioner," 1950, which, for the sake of brevity, is referred to as the "Cohen Report." It has found that a high proportion of general practitioners are doing good work, but many of them are handicapped in various ways, more especially by the lack of personal contact with consultants and hospital services. The Committee's recommendations are, in general, designed to secure for the practitioner all the facilities and contacts he needs if he is to exercise his

capacity to the full and to provide the best possible service for his patients.

The Committee wishes to draw the attention of the Council to one aspect of its research which it believes has proved of especial, though somewhat intangible, value. The very nature of the field survey demanded that an official of the Association should visit and discuss problems with members of the profession who are normally remote from the activities of professional bodies. It feels that much knowledge was gained on both sides, and understands that several practitioners, especially in the remoter areas, were very gratified that they should be thus visited.

Acknowledgments

The Committee wishes to place on record its grateful thanks to the 188 general practitioners who received Dr. Hadfield, and the 12,879 practitioners who, by replying to the questions put to them, enabled the views of such a large proportion of the profession to be assembled. The response of 72% from the National Health Service practitioners and of 56% from the private practitioners in the postal survey was not so large as had been hoped, but the Committee believes that the result does reflect the thoughts of the general body of practitioners.

The Committee also acknowledges the help given by the 167 consultants who answered questions on their relations with general practitioners, and by those practitioners who sent memoranda of their views in response to the invitation published in the *Supplement to the British Medical Journal*.

The Committee wishes to record its grateful thanks to all who worked with it to produce this report: to the pathologists who gave an account of the work in their laboratories, as well as to the other consultants who replied to specific questions; to all the general practitioners who answered the questionnaire and gave their opinions, and to those who sent in memoranda. The Committee has a special word of thanks for the general practitioners who allowed their practices to be surveyed.

It wishes to record its gratitude to its Secretary, Dr. S. J. Hadfield, who combined the labour of a Hercules with the wisdom of the Serpent, and whose enthusiasm and tact made it possible to complete both the Field Survey and the Report in reasonable time.

It is most deeply indebted to all those at B.M.A. House—the invaluable Miss Saxby, the secretaries, the typographers, and those in the card index and filing departments who worked long hours and who responded to the many and varied calls made on them by the Committee to make the Report as complete and accurate as possible.

That this Report has been achieved shows that unity of purpose in the profession is not only desirable but also practicable.

MEMBERSHIP OF THE GENERAL PRACTICE REVIEW COMMITTEE

The Committee appointed as its Chairman Dr. C. W. WALKER, M.B., B.Ch., a general practitioner in Cambridge.

The other members of the Committee were as follows:
Sir HENRY COHEN, M.D., F.R.C.P., Professor of Medicine, University of Liverpool. (President, 1950-1; co-opted to Committee, March, 1952.)
A. W. S. SICHEL, M.D., D.O., Capetown. (President, 1951-2.)
E. A. GREGG, J.P., M.D., General Practitioner, London. (Chairman of Council.)

J. A. BROWN, M.D., General Practitioner, Birmingham. (Chairman of Representative Body, 1950-1.)
S. WARD, M.B., Ch.B., General Practitioner, Birmingham. (Chairman of Representative Body, 1951-2.)

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A POSTAL INQUIRY AMONG 12,879 GENERAL-PRACTITIONER PRINCIPALS, JULY, 1951

METHOD OF INQUIRY

When the sample of general-practitioner principals in the National Health Service required for the Field Survey had been drawn, there remained 18,346 who were invited to co-operate in the Postal Inquiry. These were divided so far as possible into groups of 500. Between the counting of the groups and the issue of the questions there were losses due to death, retirement, etc., giving a final figure of 17,616 practitioners from whom replies could have been received and reducing the sizes of the groups to between 468 and 489.

The Committee drew up a long list of questions, and each group was asked two of them, though some questions contained more than one part. The question papers were issued on July 12, 1951,* and the total number of practitioners who replied was 12,657, or 72%. A detailed classification of these is shown in the Table below.

In addition, 398 private general practitioners were divided into groups of 22 or 23, and each group was asked two questions appropriate to private practice. The number who replied was 222, or 56%.

In order that practitioners might feel free to make any comment they wished, each was given a serial number; no names appeared on the question forms, nor were they available to the Committee.

The report prepared for the Committee covered 230 typed foolscap pages and included full statistical tables. It is not possible, for reasons of economy, to print the whole of it, but it is believed that the summary in the following pages will indicate the scope of the inquiry and the character of the response to each question.

Analysis of N.H.S. Practitioners Replying to at Least One Question

Class No.	Description		No. in Class	% of Total
	Age Group	Practice		
1	25-39	Single-handed urban	862	7
2	40-59	" "	2,507	20
3	60 and over	" "	699	6
4	25-39	Partnership	1,582	12
5	40-59	" "	2,401	19
6	60 and over	" "	447	4
7	25-39	Single-handed rural	364	3
8	40-59	" "	1,027	8
9	60 and over	" "	272	2
10	25-39	Partnership	899	7
11	40-59	" "	1,320	10
12	60 and over	" "	277	2
			12,657	100

Types of Practice

			No.	% of Total
Town practitioners	..	..	8,498	67
Country ..	..	..	4,159	33
			12,657	100
Single-handed practitioners	..	..	5,731	45
Practitioners in partnership	..	..	6,926	55
			12,657	100

Age Groups		No.	% of Total
25-39	..	3,707	29
40-59	..	7,255	57
60 and over	..	1,695	14
		12,657	100

* This was before the announcement of the Danckwerts award and the subsequent improvements in the conditions of service for general practitioners in the National Health Service.

I. THE RANGE OF GENERAL PRACTICE

1. Continuity of Care

One group of general practitioners were asked questions about their arrangements for providing continuous care for their patients. The answers of the 357 (75% of the group) doctors who replied show that, in general, patients are attended by their own doctor personally, though there is a certain amount of overlapping between a practitioner and his assistant or between partners. Among those in partnership 68% state that, over a period, a patient may be attended by more than one doctor, but 59% also state that during the course of any one illness the patient will be attended by one doctor only.

Almost 70% of those doctors who were in practice before July, 1948, have not made any change in their methods in this respect on account of the introduction of the N.H.S. Five, however, stated that their partnership had been compelled, owing to increased work and longer surgeries, to "regionalize" their visiting-lists so that patients living in a particular district would be visited by a particular partner. "If one of us works on any one day to the north of the town, the other partners' cases in this area are seen by him. Bad for medicine, but what else can one do?" Three doctors commented that patients no longer expected a particular doctor.

2. Health Education and Preventive Medicine

Of the 338 general practitioners who replied to a question on this subject 50% stated that they take a real interest in this aspect of their practice; 43% give advice or inoculations when asked, but take no very positive steps in the matter of health education. Sixty-five practitioners, including 35 who classified themselves as keen on this work, commented upon the lack of time for health education in the N.H.S. This was the main adverse effect of the N.H.S. referred to in this connexion. Others among the 31% who thought the N.H.S. had had a bad effect mentioned the "mass introspection induced by a free service, and the lack of co-operation on the part of local health and school authorities." An urban doctor found that his discouragement came from his colleagues. He specified as a "bad effect" of the N.H.S.: "Less time to talk to patients, less energy to organize informal discussions and meetings. Fear of criticism by colleagues and executive if such meetings are organized."

3. Treatment of the Patient as an Individual

A group of practitioners were asked whether the N.H.S. had had any effect on their ability to get to know and treat their patients as individuals in the sense of paragraph 25 of the Cohen Report, which reads: "In order to arrive at an accurate diagnosis and to prescribe effective treatment the general practitioner must have regard to the 'totality' of his patient, his distinctive personality, his home environment, his occupation, his emotional make-up, his earlier medical history, and the rest. The doctor will consider the patient's illness in this background and perspective, for without this knowledge an illness may present difficulties in diagnosis and inappropriate treatment may be

prescribed." Of the 312 practitioners who replied, 38% state that the N.H.S. has had no effect, but another 38% (or 43% of those who were in practice before July, 1948) feel that they are not now able to give such full regard to the individual "totality" of each patient as they would wish. The reasons given most frequently are the great increase in work and the demands for medical treatment for trivial conditions, which leave insufficient time for the thorough investigation of patients who need it and for becoming acquainted with the background of each patient. One doctor sums up in the following way the views expressed by many: "Too many patients per day → less time per patient → no doctor-patient relationship → inadequate history, no explanation, no thought, no reading, → no diagnosis. Inadequate remuneration → undercurrent of dissatisfaction, little incentive → poor work."

Two factors were mentioned by several doctors as being partly responsible for denying to the general practitioner the opportunity of treating his patient as an individual. The first was the view held by many patients of the function of the general practitioner. They regarded the doctor as being there to sign certificates, to give prescriptions, to "sort" cases, and to give letters for hospital consultations. The other factor was the attitude of hospital staff towards general practitioners and the absence of liaison. This led, it was felt, to a lowering of the status of the general practitioner both professionally and in the eyes of patients. The complaint is illustrated by the following reply: "Any investigation requires the patient to be sent to a specialist, and if I am lucky I get a brief note after a considerable time telling me what the specialist thinks. If investigations are prolonged I am still responsible for the patient, and if anything acute arises I am quite unaware of what has been excluded by investigation."

The N.H.S. was considered to have had a good effect on this aspect of practice by 9% of the group who were in practice before July, 1948. They gave as a reason the earlier attendance of lower-income patients, which enabled the doctor to know the patient and to prescribe freely.

4. Diagnosis

Paragraph 26 of the Cohen Report described the function of the general practitioner in connexion with diagnosis. A group of doctors were asked what effect, if any, the introduction of the N.H.S. had had on their ability to exercise responsibility for diagnosis. Of the 367 who replied, 42% stated that the N.H.S. had had no effect, and 42% that it had had an adverse effect.

Most of the "good effects" observed by 9% related to the more easily available hospital services and domiciliary consultations. One doctor wrote: "I am now able to exercise a 'watching brief' without financial loss to my patients. Patients attend at an earlier stage of the illness, they attend more frequently, and I am able to make a thorough study of my practice. I find that intimate knowledge means better ability to diagnose any particular patient."

The "good effects," however, were greatly outnumbered by the bad. Two-thirds of those practitioners who replied "bad effect" referred to lack of time or the heavy demands for treatment for trivial ailments. The haste necessitated by crowded surgeries was said to induce mental fatigue and strain, diminish alertness of mind, and cloud clinical judgment. This led to a

tendency to "spot diagnosis" and to the reference to hospital of any cases requiring much thought. One doctor had had 40 patients in his surgery on the day he replied to the question and had been able to devote not more than three minutes to each.

A summary of the effect of lack of time and increased work is given by a young doctor in an urban partnership:

"1. The incredible amount of work one has to cram into 24 hours makes it impossible to examine people properly. This means that: (a) I have to jump to conclusions, and therefore may and do make errors which I would not otherwise have made. (b) I refer patients to hospital without having properly investigated them first. (c) I tend to congratulate myself on the speed with which I can polish off large surgeries and waiting-lists and not on any clever diagnosis or considered line of treatment. (d) I fight shy of treating a long-drawn-out case or a serious one if I feel I can get it into hospital. I just cannot fit them in. (e) I completely shun all minor surgery that I can get out of. Again, I just cannot find the time. (f) I cannot study the journals as I would like.

"2. The patient's attitude to me as a doer-out of cough mixtures, etc., and a pointer to hospital out-patients."

5. Minor Surgery

Of the 336 practitioners who replied to a question concerning their attitude towards minor surgery which is within the range and competence of a general practitioner, about 50% were anxious to undertake this work. Half of them also said that the introduction of the N.H.S. had had a bad effect on general practice, the main reasons being lack of time on account of increased work and the patients' expectation that minor surgical operations would be performed in hospital.

Seven practitioners complained that they were now deprived of opportunities for performing minor surgery in the local cottage hospital, and one that it was now difficult to make arrangements there owing to the increased number of consultants' sessions held. Another was unable to continue his fracture work as the local x-ray department had been closed. On the other hand, 14 doctors stated that they still undertake minor surgery in local or cottage hospitals. One of the latter added that, as his remuneration for hospital work was inadequate, the time spent on minor surgery was a financial loss.

The attitude of 22 doctors towards undertaking minor surgery is affected by the absence of extra remuneration which would provide an incentive. An urban practitioner in the middle-age group gives his view as follows:

"Before the Health Service, we did all our own minor surgery, including the reduction and putting up of fractures of the smaller bones. We had an immediate x-ray service kindly supplied by the local dental surgeon.

"Now, we refer most of it to hospital, retaining only that which our own pride and Christian charity require that we do ourselves.

"Why? Because we are not paid (1) for the skill needed, (2) for the responsibility of the job itself, or (3) for the responsibility of the aftercare. Even claims for the general anaesthetics so often needed are not popular with the 'keepers of the pool'."

About 4% of those replying thought that the N.H.S. had improved the position, mainly by providing better facilities for minor surgery in the hospitals. One doctor said that the work would be better done in hospital because a general practitioner attempting it would be too hurried.

6. Information to Consultants

It is noted in the Cohen Report that one of the duties of a general practitioner is to supply to consultants and specialists the fullest possible information about patients sent for an opinion or treatment. A group of practitioners were asked to describe their customary procedure in such cases. Of the 360 who replied, two-thirds write a short account of the history and their own findings, and 29% write a full letter giving details of the case, their own findings, and environmental factors.

7. Non-medical Advice

After enumerating the medical functions and responsibilities of the general practitioner, the Cohen Report adds a paragraph about the non-medical advice which patients frequently seek from their doctors. In order to ascertain the feelings of general practitioners on the matter, the Committee asked a group to indicate which of certain descriptions most appropriately defined their attitude towards the giving of non-medical advice to patients. Of the 348 who replied, 85% stated that they were prepared to give advice when asked, and regarded it as an incidental part of medical practice.

Three doctors mention that it is sometimes necessary to give such advice as part of treatment without its being asked for by the patient. "Non-medical advice is frequently given without it necessarily being asked for. Its need may not be appreciated by the patient till it is given. Conditions of work and environmental and social factors are often important in relation to psychological aspects as well as physical. I would not regard this as necessarily non-medical if medicine is viewed in any but the narrowest aspects."

8. Special Interests

In a group of 272 general practitioners 54% have some special interest within the scope of general practice. The branch in which the greatest number of practitioners take a special interest is midwifery, followed by paediatrics, anaesthetics, and minor surgery. Only one-third of those with some such special interest are able to develop it, the chief reasons being lack of time and lack of access to hospital beds and facilities.

9. Advances in Medical Knowledge

The range and methods of general practice are necessarily influenced by the general advance of medical knowledge and by progress or change in other fields of medical practice. The Committee accordingly included a few questions designed to ascertain how such factors had affected general practice during the last five years. The first of these asked what effect, if any, advances in the science and art of medicine had had on the doctor's practice.

It is clear that general practitioners are deeply appreciative of the new means of treatment placed in their hands by the discovery of antibiotics and the advances in chemotherapy. They enable the doctor to control infection, to shorten the duration of illness, and to treat at home patients who would previously have been removed to hospital. As one doctor replied, "One can now really treat disease. The day of the placebo is gone."

Of the 301 practitioners who replied to the question, 14% stated that advances in medical knowledge had had no effect on their practice, 63% a good effect, and 4%

a bad effect; 11% felt that, from the point of view of their practices, the benefits of the progress of medicine were tempered by disadvantages. Four of them considered that, while medical science had advanced, the art of medicine had declined. Two doctors expressed this more specifically by stating, as a "bad effect," the tendency of modern medicine, with its numerous investigations, to drive practice into the hospitals. Thirteen others mentioned this emphasis on the hospital as a bad effect. The remaining practitioners were unable to decide or gave an irrelevant answer.

That modern therapeutic methods made more work for the general practitioner was the opinion of 14 doctors, three of whom pointed out the time required for injections of penicillin and other drugs and for the sterilization of needles and syringes. One found that advances in medicine increased the number of patients coming for treatment, though they reduced the time required for each patient. The difficulty in the present conditions of general practice of finding time to keep abreast with advances in medical knowledge was mentioned by five doctors, and one said that he had no time to apply the new methods.

10. Increasing Specialization

Nearly half the doctors replying to a question asking whether they thought that increasing specialization had any effect on their general practice answered in the negative. The good and the bad effects were almost equally matched.

Most of the "good effects" concerned the new methods of treatment available, the higher degree of accuracy in diagnosis, and the readily available specialist advice.

Four practitioners refer to the narrowness of the field of certain specialties and the effect of this on general practice. One doctor writes: "Some specialists are so highly specialized that they cannot recognize or correlate facts which fall outside their own particular field." Another finds it difficult to obtain a "well-balanced" opinion. The multiplication of specialties is found by four doctors to retard diagnosis. They find, for example, that delays are caused by one specialist referring to another, and that "patients referred for simple matters, such as blood counts, find themselves encouraged by physicians to embark on long mechanical investigations quite apart from the original query."

A desire for more general consultants is expressed by one doctor who finds that "individual specialists are not interested in what might be termed 'allied' specialties. This throws extra work on both the general practitioner and the patient. The problem might be solved by a group of specialists working as a team." The multiplicity of specialties and what one practitioner called "sub-specialists" leads some doctors to lack confidence in the opinions given. For example, a doctor who, however, replied, "No effect," wrote as follows: "I employ as I have been used such specialists of standing as I think proper for each case. It is becoming more difficult to get a competent opinion in hospital owing to the numbers of specialists more or less in training. As regards the existence of clinics presided over by young doctors who confine themselves to part of a limited subject, these are not specialists and their existence is bad for the patients and worse for themselves, but they have not affected my work much."

A "bad effect" is specified by a rural practitioner as follows: "When I send a patient to hospital to see a consultant, in 75% of cases the case is seen by a registrar, from whom I either learn nothing or am blinded by science which is often wrong. The patient is disgruntled at being seen by a young man."

Two doctors found that increasing specialization helped them to keep abreast of advances in medicine. One replied, "Work more interesting by cross-checking my diagnosis with the specialist's, and so learning and by having to read to keep up." The other replied, "Increasing contact, both personal and in correspondence, with good specialists has the effect of a continuous postgraduate course."

The loss of access to the hospital in order to accommodate the specialties is bound up with the effect of increasing specialization on the range and interest of general practice. Fifteen doctors referred to this in such terms as the following: "The ever increasing sub-specialization of local teaching hospitals limits the scope of the G.P. Anaesthetics, minor surgery (occasional appendicectomy), fractures, psychiatry, midwifery and gynaecology were all in the day's work. There is a different picture to-day." "Narrowing of scope of work of G.P. with lessening of interest and responsibility—work in cottage hospitals curtailed—no anaesthetics, no assisting at operations, even minor surgery done by young specialists."

In the opinion of five practitioners increasing specialization results in the division of control of the case and in the general practitioner losing touch with his patient. Others feel that the limitation of the range of their practice by increasing specialization and the necessity for referring a large proportion of their cases to hospital through specialists reduces their professional status. "The general practitioner more or less runs a sorting office and has a mass of correspondence. He sees less actual treatment."

A "bad effect" mentioned by 24 practitioners is the demand by patients for a reference to a specialist even before the general practitioner has made his examination or given an opinion. Three others state that there is an increased tendency on the part of patients to distrust the general practitioner's judgment and to expect specialist investigation and treatment for comparatively trivial conditions.

11. The Public Health Service and the General Practitioner

From time to time the effect on general practice of the activities of the public health service has been the subject of discussion in the Association. As this may affect the range of service which the general practitioner is able to provide for his patients, the Committee asked a group of general practitioners whether their practices had been affected during the last five years by any development or deterioration of co-operation between the public health service and the general practitioners of the area. About three-quarters of the 339 who replied did not think that it had any effect. Ten per cent. thought the position had improved and 10% that it had deteriorated. Most of the criticism related to the maternity and child welfare and school clinics.

12. Public Education in Health

The theme of the replies to the question about the effect on general practice of public education in health was that "a little learning is a dangerous thing," the

line being quoted by many practitioners. The question asked whether the effects, if any, on the doctor's practice were slight or marked.

Of the 343 practitioners who replied, 28% thought it had no effect, 47% a slight effect, and 20% a marked effect. Of 203 comments, 38 specified good effects and 165 bad effects. Two practitioners who gave no opinion felt they could not give a reliable answer without making a special inquiry among their patients. One doctor considers that all health articles which deal with a specific disease are detrimental to the public morale, for "the lay mind is quite incapable of assessing the value" of such an article. He reports "a spate of cancer phobias" after a television health talk. Another refers to the television feature on slimming as "deplorable."

The difficulties of the general practitioner in dealing with patients who have been listening to radio health talks are illustrated by the comments of two doctors. "Has made consultations over illness, trifling and severe, more difficult because the patient's mind is filled with the little he has gleaned from the 'education.' He will, for example, show little faith in advice or treatment not mentioned in his 'education.'" "Some people become more nervous with regard to the various broadcast illnesses and themselves, and so visit the doctor unnecessarily. They place more stress, often, on what has been heard, especially in the way of treatment, than on what they are told by their doctor, and are inclined, therefore, when the two treatments differ to think they are not getting proper treatment from their own doctor."

The tendency to introspection and neuroticism is expressed as follows by one doctor: "Many patients trot out knowledge, usually ill-digested or distorted with an added anxiety component, sometimes marked. Frequently the question, 'What have you been reading or listening to?' brings things back to a healthy plane. The more aggressive type will argue and insist, with logical thinking in marked abeyance. Frequently requests or even demands for treatments or investigations selected by the patient follow the home-made diagnosis. In my opinion patients are becoming increasingly disease-minded and suggestible, and anxiety is increasing, largely attributable to matters read or listened to." Another says that the "public is scared stiff about 'polio' and reacts strongly to every publication and report, however slight"; and one gives as an example: "After a television talk on poliomyelitis I saw a number of patients complaining of headache lying in bed thinking they had the disease." The effect of Press articles during the influenza epidemic of 1950-1 is described by a doctor with a large rural practice: "The whole population became 'jittery' and our work increased by leaps and bounds. In fact, for two weeks the practice became almost unmanageable, with 90% of the patients only suffering from the common bronchial cold."

Demands for treatment or drugs read or heard about form a large proportion of the "bad effects." The following note from a doctor summarizes the attitude of patients of this type: "A tendency on the patient's side to suggest his or her own medical treatment—for example, Can I have penicillin or 'M. and B.'?—for complaints where it could not possibly be expected to help, such as chronic eczema. Requesting 'sight tests' (O.S.C.I) for every trivial headache, producing a feeling of lowered status

and inferiority in the general practitioner." Several doctors refer to the facts that treatment with many of the drugs asked for is still in the experimental stage, that some of the drugs are not available for general use, and that treatments available in America are not available in this country. The general practitioner's inability to provide the drugs desired causes distress to the patients, some of whom believe that the doctor is withholding from them what might be beneficial. Specialist investigations and auxiliary services are demanded before the general practitioner has examined the patient. One doctor says: "Most people now ask for physiotherapy if they have a pain in the back."

Most of the "good effects" mentioned related to increased requests for vaccination and immunization and the earlier attendances for treatment of serious disease.

Several doctors find the effects of public education in health are mixed, some being beneficial, others harmful.

A doctor who thinks that "generally speaking the public have not been well informed from above" adds: "There is only one way, in my opinion, to educate the public on health matters: by personal talks and discussions in the consulting-room or in the home by doctor to patients. By all means let the above-mentioned agencies start the ball rolling, but only the doctor-patient relationship can drive it home."

In spite of health education the public is still ignorant on the subject. One doctor estimates that 0.5% of his patients "seem to have been somewhat enlightened"; another finds that primitive ideas still exist.

Three practitioners point to the need for the doctor to keep himself up to date in medical knowledge if he is to be able to reply to the questions patients now ask. One writes: "It is more than ever necessary that the practitioner should be fully up to date in order to be able to digest the information that he receives. Mothers particularly are more worried and very much unnecessarily by the problem of 'polio': patients read of A.C.T.H., etc., and want to hear all about it. The practitioner has to be able to explain matters simply on a wide variety of topics if he is to avoid the persistence of constant underlying anxiety stress syndromes in his patients. I spend much time in preparation for explanation—I find this essential."

Several practitioners offer suggestions for topics of instructions:

(i) Emphasis should be laid on simple rules of health and general hygiene. In mentioning the latter a doctor says that housewives work themselves to death scrubbing doorsteps, but do not know how to handle food cleanly.

(ii) More instruction should be given in certain diseases. "There is tremendous scope for education about upper respiratory infections. These form at least 75% of one's work in the winter, and reassurance and encouragement to keep away from crowded surgeries would be of benefit."

"If tuberculosis were publicized as much as 'polio' it would do more in reducing the general mortality."

"Tonsillitis, with its common complication otitis media, could be minimized by some publicity—for example, 'Don't neglect sore throats or earache (especially in children).'"

Septic fingers and hands: "These usually arrive days too late at the surgery."

Cancer: "There are still too many late skin, breast, and uterine carcinomata reporting: this is only true for the 45+ age group."

Timing of propaganda for diphtheria immunization: "Publicity at the opening of the 'polio season' wastes a lot of time by having to postpone cases until the autumn."

13. The Effect of National Health Service on the Scope of General Practice

The last question in this group asked whether the operation of the N.H.S., disregarding any question of abuse or maladministration, had increased or diminished the scope of the doctor's practice. The replies sent by 336 doctors indicated: no change, 27%; increased, 31%; diminished, 30%; the remainder not having been in practice before July, 1948.

Expressed in this form, however, the figures are misleading, for inspection of the comment reveals that many of those who answered "Increased" interpreted the word "scope" as "amount," while those who answered "Diminished" interpreted it as "range," which was the Committee's intention. It seems likely that, had some of the 59 practitioners who replied "Increased" because of the large increase in attendances at the surgery carried their thoughts a little further, they would have arrived at the same conclusion as those who answered "Diminished" for the same reason. The preponderance of the replies would then have shown that the scope of general practice had diminished.

Lack of time is the dominant reason given for the reduced scope, time having to be given to the treatment of trivial conditions at the expense of the investigation of more serious illness and of the more interesting aspects of general practice. As one doctor put it, "The call is not so much for real medical investigation as for odds and ends, some of which are most unnecessary."

14. Midwifery

Questions addressed to one group of doctors were designed to ascertain the attitude of general practitioners towards midwifery. Of the 308 who replied 76% were general-practitioner obstetricians. Half of the 297 practitioners who classified themselves according to their attitude towards midwifery stated that they like it and wish to increase their experience of it; one-third undertake cases only when specially asked to do so; and the remainder wish to discontinue it. Lack of time was the most frequent reason given for wishing to discontinue it.

Eighteen practitioners indicated in additional comment that they found satisfaction in midwifery or regarded it as an essential part of general practice. "I feel it is the family doctor's duty and privilege to see his patients successfully through their pregnancy and childbirth." "The practice of obstetrics gives me a sense of satisfaction and achievement, and I feel that I can do the work to the patient's satisfaction also." "It is the key-stone of a successful general practice. It is the branch of medicine which allows me to exploit my skill and art to the fullest." Two stated that midwifery helped to establish the family doctor relationship. Some doctors thought midwifery "one of the few good things" left to the general practitioner, and one found it "a pleasant change from the minor ailments, etc., which appear to make up so much of general practice to-day." Another remarked, "A practitioner cannot undertake abnormal midwifery unless he is doing a certain amount of normal midwifery."

The difficulties of finding time for midwifery are mentioned by 18 doctors. For example: "The great increase in the volume of work caused by the introduction of

State medicine makes a large midwifery list an intolerable burden. On the other hand, I consider midwifery is an essential part of general-practitioner service, but the practitioner must have more time to devote to it." "I have a large general practice and find that midwifery interferes with ordinary work. I dislike undertaking the responsibility without having enough practice in the branch to keep myself up to date." Some young practitioners state their position as follows:

"I like midwifery a lot. Chiefly as a G.P. it increases one's meagre yearly salary. Unfortunately, as I have not attended 20 confinements I am not allowed to call myself a G.P. obstetrician, but as I am in partnership with an obstetrician I manage A1. Owing to G.P. work I have not time to fulfil local obstetrician committee's requirements."

"I would like to discontinue it as it is time-consuming and often at inappropriate times, and I don't like it. However, I must do it as it forms an important part of my income (an essential part). Therefore I am anxious to increase my experience in order to become more efficient and give good service, which I think I do."

The position in a country practice was described by another doctor, who wrote: "I undertake any midwifery that comes to me. I do not like midwifery now, for only abnormal midwifery is dealt with, usually in appalling conditions, which in the country takes a lot of valuable time, and the remuneration for doing abnormal midwifery, maybe 18 miles away in the hills in bad conditions, is not satisfactory. Most patients now book up in hospitals, as they can get little help in the home, and the public are beginning to realize that midwifery under bad home conditions is a menace. The majority of cases now seen are for antenatal supervision and any treatment; they are mostly confined in hospital and handed back for post-natal care. This works very well indeed and seems to please all concerned, I think."

15. Accommodation for Chronic Sick

Accommodation for the chronic sick was the particular subject of a question put to a group of practitioners who were asked whether they could command sufficient hospital accommodation for this class of patient. Of the 348 who replied 87% gave a negative answer. This may be compared with the 95% on this point in the group which was questioned generally on the adequacy of hospital beds.

Comment referred to the heart-breaking plight of some old sick people living alone without attention and unable to obtain a hospital bed. By the time a bed is offered the patient may be dead. A doctor replied: "Position has never been worse—I am told that chronic sick patients cannot be sent home once in hospital as relatives will not have them. The waiting-time seems to be months or years for the aged sick—many of these old people do not need full hospital services. They do require night attention and the attention of a warden and assistant nursing orderlies with a visiting district trained nurse—at present many of them on the waiting-list are living in crowded conditions with little care, and their condition is quite tragic. There should be more home helps and more financial compensation for relatives who tend the chronic sick at home." Another reported that in his town of 50,000 population there was now no accommodation for the chronic sick, though before the introduction of the N.H.S. admission to beds could be easily obtained through the relieving officer. Another, however, stated that the period of delay had been reduced from six months to two weeks.

16. The Care of Tuberculosis

Of the 313 practitioners who replied to a question asking whether they were satisfied with the present arrangements for the domiciliary care of tuberculosis in their areas, 46% replied "No," 44% replied "Yes," and 10% could give no opinion.

Fifteen practitioners (9 replying "Yes" and 6 replying "No") expressed appreciation of the helpfulness and co-operative attitude of the tuberculosis officer and his department. Two of the six replies which amplified the satisfactory arrangements may be quoted: "This is one bright spot in a rather gloomy outlook. I feel that to the county public health service is due every credit for an enormous advance in this aspect of the tuberculosis campaign. The improvement has been striking in the past ten years, and is not due to the N.H.S. Such defects as exist are outwith the control of the public health service—chiefly housing difficulties." "The appropriate health visitor calls regularly; the tuberculosis officer calls at any time on my request. The patients who can travel by themselves attend the local clinic regularly and those who cannot travel by public transport are taken by ambulance for x rays or refills. The tuberculosis officer is most helpful at all times."

The majority of the specified unsatisfactory arrangements fall under a few main headings. Several of them are combined in the following reply:

"(1) The great delay between notification and the first visit from the health visitor. (2) The infrequency of the visits by the health visitor and to the clinic so that I have to do the day-to-day treatment—which I do not mind—but I have no knowledge of the x-ray reports, B.S.R. or sputum reports except what I can glean from the patient. (3) The distance of the clinic is 3–5 miles with two bus changes for patients in this borough. (4) The tuberculosis officer rarely visits the patients. (5) In spite of having a large practice I have only once met the tuberculosis officer in a patient's house, and that by chance."

Examples of the lack of liaison between the general practitioner and the tuberculosis officer are given in the following replies:

"Initial treatment of the tuberculous patient gets under way satisfactorily, but further information as to progress and future treatment is too often lacking. The tuberculosis department is no doubt grossly overworked, but when the G.P. has no information to give his patient, following a repeat x-ray examination, etc., the patient is needlessly distressed and the important psychological angle is badly let down."

"In cases attending the chest clinic regularly, the physician does not lay down specific enough instructions in his reports to me, and does not report his findings and advice at regular intervals. In the few cases unfit to attend the clinic, I find they are not visited regularly, and again I lack specific and regular guidance. It could be said against my criticism that I could find out all this by a personal visit or telephone, but all this takes time."

Two practitioners remarked on the division of responsibility for the patient. One wrote: "It is difficult to know whether one is primarily responsible for the care of these cases or whether the local tuberculosis officer is. In some cases directions and prescriptions are left by the tuberculosis officer and in some cases the practitioner is left to his own devices."

The delay in providing specialist treatment may place the general practitioner in a difficult position. Thus, a doctor replied: "The patient falls between two stools. Admission to hospital is not usually possible for a long

period, during which time T.O. does nothing and patient relies on G.P. for treatment. G.P.'s treatment must be non-specific, and in many cases deterioration occurs. Since advent of streptomycin, with co-operation with T.O. treatment is sometimes started at home in suitable cases, and this has helped but by no means solves the problem." Another wrote: "With the increased demands already made on the general-practitioner service due to the Health Scheme, I find that my cases after reference to the chest clinic are sent home to bed and left there, and the only domiciliary care is the periodic visits of the G.P. Far too many of these cases clutter the visiting-lists and leave a sense of frustration as we feel we can do nil, and visiting week by week becomes monotonous in the extreme."

Several doctors complained that patients were not visited in their houses often enough by tuberculosis officers. One replied: "Not visited by tuberculosis officer often enough. Sent home to bed to await sanatorium bed and very little attempt made by authorities to show they are still interested in the case."

The difficulties of patients in present housing conditions appeared in many replies, as, for example:

"Cases of active respiratory tuberculosis are allowed to remain in dark airless basement flats waiting for months for admission to sanatorium."

"As methods of diagnosis have so vastly outstripped methods of 'disposal' of patients, and as the 'housing' problem and overcrowding are as bad in — as anywhere in U.K., 'domiciliary open tuberculosis' is a menace to all the remaining occupants of the buildings—often far too many of them. Many cases in consequence which are treated as domiciliary cases would in the 'bad old days' have been in sanatoria long before."

Seven doctors stated that, in general, they were opposed to the domiciliary treatment of tuberculosis.

"The shortage of hospital beds makes many difficulties for the general practitioner. The following are some illustrations:

"The dispensary side is good. The tuberculosis officer is most co-operative and helpful. We sadly lack beds for institutional care and for the later chronic or advancing case. The beds available are not even adequate for the early acute case group. The result is that the late case has to be nursed at home with considerable possibility of spread to other members of the household."

"Insufficient hospital beds to accommodate patients when complications arise that need hospital care—should be more beds allotted for such cases. Huts should be made more comfortable, so that patients will not sneak back into the house when winter conditions are rather harsh."

"Patients who are actually dying of tubercle are refused admission to hospital. Even though they cannot benefit from treatment, surely they should sometimes be admitted, from humanity?"

Two practitioners mentioned particular groups of patient. One stated that "elderly persons with chronic pulmonary phthisis are not catered for adequately." The other is dissatisfied because "there is no specific treatment available for the milder forms of pulmonary tuberculosis." Another doctor suggested that more tuberculosis patients "should have institutional treatment while they learn a way of life."

The official attitude towards the problem of the domiciliary treatment of tuberculosis and the administrative arrangements were criticized by several doctors. For example: "The magnitude of the problem here has dulled the appreciation of urgency in tuberculosis

officers and the hospital boards, and provides an excuse for inaction or dilatory action after much prodding by individual G.P.s." One doctor replied: "Dilatory, easy-going attitude to the problem by P.H. department still persists. Too great time-lag in putting into effect appropriate treatment—for example, pneumothorax. Delay in forwarding information—for example, x-ray result. The 'open' case still not regarded as urgent requiring immediate segregation (which is impossible in the overcrowded tenement dwelling). Expensive 'health visitors' set-up could be more usefully employed doing nursing duties in the district or in sanatoria."

The administrative changes which were made as a result of the introduction of the N.H.S. are commented upon by four practitioners. One found an improvement when a tuberculosis officer was appointed in the area. "Since July, 1948, there has been an all-round increase in the care of tuberculosis cases, due mainly to the fact that a tuberculosis officer is now centred in the area. Formerly this work was done by the M.O.H. along with countless other jobs. X-ray examinations are done more frequently, patients attend clinics more frequently, and domiciliary cases are visited more frequently by nursing staff." On the other hand, one doctor replied: "Have not noticed any such arrangements since responsibility was removed from the M.O.H. to a newly appointed chest physician." In the area of one doctor there is lack of co-ordination because the tuberculosis officer is employed by the county borough council and the health visitors by the county council. The following remarks are offered by a rural doctor: "The M.O.H., who is tuberculosis physician for the county, is employed on a basis of two-thirds by the regional hospital board and one-third by the county council. The cost of domiciliary treatment of tuberculosis in the shape of streptomycin, by a decision of the regional board, is charged against the I.D. hospital and constitutes a large part of the expenses thereof. The primary loyalty to the regional board appears to result in an attempt to keep down these expenses by reducing the number of patients under treatment. If this cost were to be removed from the regional hospital board to a separate account financed direct by the department of health I am sure that improvement would result."

II. THE DOCTOR-PATIENT RELATIONSHIP

A short series of questions was designed to find out how doctors felt about their relations with their patients, and any changes which may have taken place as a result of the introduction of the National Health Service.

1. Doctor and Patient

As the first question of this series a group of doctors were asked to indicate their general relations with their patients.

A summary of the replies of the 350 doctors who answered the question is given on the next page.

The predominance of the first category suggests that the traditional intimate relationship between doctor and patient persists through at least half the group. The "matter-of-fact" relationship has penetrated to only 8%, but that there is a danger of deterioration in consequence of conditions of practice in the N.H.S. is emphasized by the remarks of 25 doctors. As one of them expressed it, "In pre-N.H.S. times Category A applied to all my patients, private and panel. I regret to say that Category B is now the general rule, and it appears to be rapidly degenerating to C." Another doctor said that, while Category A applied to the older

	Total		Town		Country	
	No.	%	No.	%	No.	%
(A) Very friendly relations	188	52	121	51	67	57
(B) Moderately friendly relations	127	36	87	36	40	35
(C) Mainly matter-of-fact	27	8	22	9	5	4
No definite answer	14	4	9	4	5	4
	356	100	239	100	117	100

	25-39		40-59		60+	
	No.	%	No.	%	No.	%
(A) Very friendly relations	37	41	113	54	38	69
(B) Moderately friendly relations	42	47	70	33	15	27
(C) Mainly matter-of-fact	6	7	19	9	2	4
No definite answer	5	5	9	4	—	—
	90	100	211	100	55	100

patients to whom he had been family doctor for 30 years, Category C applied to the younger patients, who were determined "to get some return for their insurance."

Seven replies referred to the difficulty of maintaining a happy relationship when the demand for treatment for trivialities or the lack of time produced irritability and short temper in the doctor. One doctor, who gave Category C as his reply, wrote: "Since July, 1948, I have discouraged the relationship in A and B, as it leads to abuse, especially extravagant prescribing. Quite definitely, C is the basis since July, 1948, on which I insist." Another, on the contrary, replying in Category B, stated that the relationship on his part has to be apparently friendly, otherwise "the economic threat of transfer may easily become dynamic."

2. Servant or Friend?

Another question was an attempt to discover how doctors felt they were regarded by their patients—whether as an official, a professional man, a servant, or a friend.

A number of the doctors who were asked this question found it difficult to answer and were unable to decide, among the varying attitudes of their patients, which was predominant. For the large group who felt that they must reply both "Professional Man" and "Friend" an additional category was introduced in the tabulation. These three categories together account for 63% of the replies.

A doctor who gave no definite reply made the point that the answers would be "biased according to the doctor's own attitude towards the N.H.S.," and another said that the attitude of the patients would depend upon the behaviour of the doctor towards them. This latter view was expressed in a more positive form by the doctor who, replying "Professional Man and Friend," added: "A friendly professional relation still exists and has been deliberately encouraged. Argument and demand are practically non-existent." Another, who replied "Professional Man," disciplines his patients: "I do not allow my patients to treat me as an official or a servant; if they require an official or a servant they must find somebody else."

Two doctors stated that the patient's attitude often depended upon how ill he was. One who replied "Servant," said that in a case of serious illness he would be regarded as a professional man, and the other, who replied "Professional Man," said that if there were anything really wrong he would be treated as a friend.

A number of doctors remarked upon the general deterioration of the relations between doctor and patient. Some noted that, while the patients who had been in the practice for many years still maintained their friendly attitude, newcomers or the younger generation or "those with left-wing politics" or migrants from town to country tended to lower the standard. Five found that patients in rural districts were more friendly or considerate than those in or from the towns. Social class was also thought to have some bearing

on the difference of attitude; one reply was: "Professional man by professional and lower middle classes, servant by working class." Lack of time in N.H.S. practice caused one doctor to reduce his category from "Friend" to "Professional Man and Friend," as he now had no time to be friendly.

Nevertheless, deterioration is not everywhere prevalent. The following note from a doctor who replied "Friend" is worth quotation: "This was pre-Act a good lower-middle and working class practice, and the change-over made little difference in professional relationships or income. Of the old private patients who have come into the Service the majority make fewer demands on my time than before. A minority who do not like the scheme show their resentment by getting as much out of it as they can. I see a lot more children than before, and this is all to the good."

The presence of a minority of patients who made excessive demands on the doctor's time was mentioned by many who described their general relationship as that of "Friend" or "Professional Man." As one doctor put it, the "unnecessary work they cause is quite out of proportion to their numbers, and they are a cause of dissatisfaction."

3. The Family Doctor

In view of the oft-repeated statement that the day of the family doctor is over, the Committee asked one group of general practitioners whether they thought the idea of one doctor for the whole family desirable. The reply was overwhelmingly in the affirmative, 82% considering it desirable. Eight doctors qualified their affirmative reply by saying that the family doctor idea was desirable if the patients themselves wished it, and three of those who replied "No" gave as their reason the importance of free choice of doctor. One doctor thought the family doctor desirable when there were children under 18 years of age, but otherwise it was of no importance.

Among those who attached great importance to the idea of the family doctor, one said that it was essential for complete co-operation, and another replied: "It is extremely important, as most illness is linked up with the home background, and it is impossible to sort out the neuroses without knowing other members of the family. In my opinion, this is the strongest argument against health centre practice, which will encourage the patient to see different doctors, and continuity is lost." Another, who replied "Yes" wrote: "Ordinarily speaking, the word 'family' doctor implies this, but under the present N.H.S. set-up so much is impersonal and constantly changing on the least excuse that I don't think it matters a hoot. This is one of the tragic failures of the present Service."

One of those who replied "Yes" thought that in a group practice one family should be attended by one group of doctors rather than by one particular doctor.

Among those who thought the idea of no importance was a woman doctor who wrote: "It seems all right in practice for me to have the woman and children and the man to go to a male doctor. It is not good for public health to take over antenatal and school-age functions without my co-operation and knowledge."

4. "Suppliers" of Drugs

The Committee asked a group of doctors whether they found any widespread tendency among their patients to regard them as "suppliers" of medicaments rather than as medical advisers. The result was as follows:

	No.	%
No	55	15
A few patients so regard doctor	168	46
Many patients so regard doctor	143	39
Total replies	366	100

The figures suggest that this is a problem which worries many doctors to a greater or less degree. Even a few patients adopting this attitude may, by their frequent returns to the surgery, cause considerable annoyance and be a drain

supplies; one doctor, replying "A few," added: "At first I thought the answer would be 'many,' but the recurrence of 'few' makes them appear 'many.'" Eight doctors stated that they had taken a firm stand, at the risk of losing patients.

The complaint, where it is specified, is that the patients ask for drugs or appliances which they have prescribed for themselves or for medicine for a self-diagnosed complaint. Three doctors mentioned the written shopping-list presented to them, which made them feel like grocers. Two said that this type of patient seemed surprised or resentful when asked questions about symptoms or when the doctor suggested an examination. Another, however, remarked that the patient who comes for medicaments usually has symptoms, and the doctor is afforded the opportunity of viewing the disease, even if the patient is at first unwilling to submit to examination."

Two doctors stated that the problem existed before the N.H.S. began, and one added: "The N.H.S. tends to tempt the doctor to be a supplier of medicaments. It would be unfair to blame the patients, who seldom resent the doctor's exercise of his own judgment." Another blamed the government for telling patients only of their rights and not of their duties.

A doctor who replied that many patients regarded him as a medical supplier wrote: "My problem is to get rid of this type and pick out the patients who are truly reporting sick. When payment for prescriptions was announced in the wireless, my next surgery was of three patients, all old patients who said that now they could attend with a clear conscience."

5. Direct Resort to Consultants

It was reported to the Committee that a number of patients went direct to a consultant without an introduction from the general practitioner. It therefore included a question on this subject, with the following result:

	No.	%
No tendency	200	61
A few patients do	124	38
Many patients do	5	1
Total replies	329	100

There seems to be no widespread tendency among patients to seek a consultant's advice direct, for not only did two-thirds of the doctors in the group answer "No," but a third of those who answered "a few" inserted the word "very" before "few." Three stated that the tendency was no greater than before July, 1948, three that the local consultants would not see the patients direct, and two that if consultants did see the practitioner's patients direct they would cease to refer any patient to the consultant concerned.

The question, however, prompted eight doctors to make observations on the tendency of some patients to ask for a reference to a consultant or specialist.

6. The Ex-Private Patient

One group of doctors were asked a specific question about the attitude of their ex-private patients—that is, those N.H.S. patients who before July, 1948, were their private patients. They were asked whether they had observed any change of attitude and, if so, whether the change was slight or marked. Of the 349 who replied, 67% felt that some change has occurred in the attitude of their ex-private patients towards them. Most of the change is adverse, the specific changes mentioned most frequently being: the more "demanding" attitude; requests for treatment for trivialities which the patients would formerly have treated themselves; demands for visits when attendance at surgery would suffice. On the other hand, 31 doctors said that ex-private patients were more considerate than formerly or seemed reluctant to call him or apologetic (27 slight, 4 marked).

Some doctors found that the attitude of their ex-private patients varied with social class. Ten found that the better class patients were apologetic and reluctant to send for the

doctor, while the lower social classes took excessive advantage of the Service. One doctor estimated that his former private club patients now utilized his services four times as much as before July, 1948. Another said that "patients of the working class moving into new housing estates are much more careless of their attitude towards me than similar type people who were private patients before July, 1948." Groups of ex-private patients who are mentioned as demanding more attention are young mothers who shirk responsibility for the health of their babies, and middle-aged and elderly women who throng the surgeries for tonics.

One doctor thought the change was one of atmosphere. This view was supported by others who stated that their former private patients seemed to be less grateful for treatment, or to be ill at ease in the surgery, or distrustful of the doctor, or that the doctor-patient relationship had been spoiled.

7. Preferences for Private or N.H.S. Patients

Two groups of practitioners in the N.H.S. were questioned about private practice. The question put to one group attempted to ascertain whether general practitioners feel that the preservation of an element of private practice alongside the N.H.S. is desirable. The group was asked to indicate which of the following three statements most appropriately expressed their attitude towards private patients: (A) I should like my practice to consist of private patients only; (B) I like my practice to include both private and N.H.S. patients; (C) I like my practice to consist entirely of N.H.S. patients.

The result of the 353 replies was 15% for A, 66% for B, and 19% for C.

Three practitioners found that a proportion of private patients made a change; as one of them put it: "The comparatively few private patients one has remaining since July, 1948, offset most pleasantly the, at times deadly, routine of N.H.S. work." Another writes: "I am quite happy about the present position—that is, the vast majority as Health Service patients, and just a few private patients (about 4% of my total number) as variety. I should dread a return to the old days of accounting, unpaid bills, self-dispensing, and the extra time and 'fussing' that private patients expect as their right. I am now able to concentrate on the patients' ills alone, without the frills!"

Some embarrassment is expressed by one doctor: "I think the N.H.S. has made it more difficult to have private patients. One feels one should not charge too much, as they have to pay for their drugs (which I think unfair and unnecessary). Also it is difficult to be sure they get any extra benefit for it." One doctor replied under B "because it doesn't make any difference to me whether it is a National Health or a panel patient or a private patient. I am always ready to attend to any ill person no matter who it is or whether he can pay or not. I think this is our real duty."

A comparison is made by a doctor between the present position and his practice before July, 1948: "My original practice consisted of one-third National Insurance, one-third public medical service, and one-third private patients. This I think is probably in an urban district the best proportion. It worked easily and there appeared to be much less discord and discontent on the patients' part than I find at present, where the public, and I think particularly women who have become N.H.S. patients, appear to be very difficult."

The reasons given for replying under C include the lack of time for the kind of service private patients expect, the view that it is wrong for any section of patients to expect preferential treatment, and the absence of book-keeping and bad debts.

A few doctors made comparisons between the three statements. One, who replied under B, would like A if he could afford it, and would hate C. Another replied: "I don't want my patients to feel that they could have better service if they paid for it directly; I also don't like the shocking abuse of the N.H.S. But as A is impossible and B undesirable I reluctantly vote for C."

8. Drugs for Private Patients

The other group of practitioners were asked whether they thought that, in their own practices, the refusal of the Government to allow private patients to obtain drugs under the N.H.S. has been a factor in causing patients to claim treatment under the Service who would otherwise have preferred to remain private patients. They replied as follows:

	No.	%
No	91	24
A few	98	26
Many	89	24
Yes (unqualified)	95	26
No evidence	2	—
Total replies	375	100

III. PROFESSIONAL RELATIONSHIPS

Personal relationships with other general practitioners and practitioners in other branches of medicine form an important feature of the general practitioner's life. The Committee included in its review a series of questions on the present state of these relationships and the effect, if any, of the introduction of the National Health Service.

1. Neighbouring General Practitioners

The first question in the series asked a group of practitioners whether their relations with neighbouring general practitioners had improved, deteriorated, or remained the same since July, 1948. Of the 310 who replied, 63% replied "No change," 19% "Improved," and 6% "Deteriorated." The remainder were not in practice before July, 1948, and could therefore make no comparison.

The basis of good relations for many practitioners seems to be the rota or group system, which facilitates off-duty periods and help in emergencies. One doctor writes: "In 1948 I formed all the G.P.s into the — General Medical Practitioners Group. This group provides constant assistance and co-operation in all aspects of G.P. Regular monthly meetings are held, as well as social and clinical meetings. Personal relationship between all the G.P.s in a population of 25,000 could not be better." Another describes his "improved" relations as follows: "I began practice on my own in April, 1948, and now have become so friendly with neighbouring practitioners that we do week-end duties 'on and off' for each other, etc., and see each other's emergency cases at other times without sending 'emergency fee forms' to local executive council."

Local general-practitioner hospitals provide a focus for good relations in two cases. One reply reads: "The inter-doctor relationship here is very good, and the ethical tone is pretty high. I think all this is due in great part to the fact that we have a local G.P. hospital to which we all belong, and where we frequently meet." Improved relations are also attributed by eight doctors to local meetings of the profession for the discussion of common problems. One of them amplified his answer under "Improved": "Since July, 1948, G.P.s in this area have had monthly gatherings at one another's houses to have a drink and a 'natter.' This was unheard of before July, 1948, and one's neighbours were always rather an unknown quantity."

Another aspect was put by the doctor who replied: "We meet oftener and seem to have much more in common—even if it is only grumbling, or perhaps I am getting older and more philosophic." The conditions in the N.H.S., to which the "grumbling" presumably alludes, are mentioned by six other doctors as a cause of bringing general practitioners together. "We are companions in distress, as a poor, underpaid, overworked, maligned profession." The attitude, however, varies. One doctor writes: "All are fed up with the new Service and therefore all are more friendly," but another puts it more hopefully: "There is considerably less competition now than ever before. We general practitioners find that we have much more in common, in our general attitude towards the Health Service, and consider that good comradeship is essential before we attempt any beneficial changes."

Competition for patients is given as a cause for deterioration by ten doctors. One of them, who replied that there had been some slight improvement in relationships, added that "as long as there is competition for larger capitation lists on account of inadequate remuneration there will be little improvement in the relationship—this is regrettable, but it is nevertheless true."

2. Public Health Medical Officers

The report on this section should be related to that on p. 108, which dealt with the effect on the scope of general practice of developments in the public health service. The same group of general practitioners were asked whether their personal relations with public health medical officers had improved, deteriorated, or remained the same since July, 1948. Of the 342 who replied, 79% stated that it had made no difference, 8% that their relations had improved, and 4% that they had deteriorated. The remainder gave indefinite answers or were not in practice before July, 1948.

Among the tributes paid by general practitioners to public health medical officers was the following: "I consider that practitioners in the area in which I, too, am in practice are fortunate that we have a district M.O. who is conscientious and co-operative. His help and advice have been of great value to me, personally." One doctor finds that "the present personnel are more anxious to co-operate when help is asked for," and a young rural practitioner had a pleasant surprise when he first came into contact with public health medical officers: "Before the war I did an assistantship in general practice in between hospital jobs. Public health medical officers then were fierce ogres my principal told me about when he wished me to pull up my socks. After I came back from the war I did more hospital jobs and more assistantships until, at the end of 1949, I became a principal myself, only to find that now public health medical officers are human friendly souls only too willing to help and advise in any difficulty."

Personalities, of course, enter into the relationships. One practitioner complains of interference in purely personal concerns by the M.O.H., while another reports that since the M.O.H.'s powers have been curtailed he has become "more modest and human" in his contacts with general practitioners.

Although the introduction of the N.H.S. has improved personal relations in some ways, the transfer of certain functions to county authorities has hindered them for some practitioners, and the personal link has been damaged. Thus, one doctor writes: "Prior to July, 1948, all public health services (except midwifery) were under the district M.O.H., with whom one had direct personal contact. Now all the personal health services have been transferred to the county council, where contact is impersonal and always with clerks!" Another replied that relations had deteriorated because "our M.O.H. is now assistant M.O.H. and the M.O.H. is in another town. . . . Questions are 'referred' and personal relationship has been largely lost."

The absence of contact between general practitioners and public health medical officers was illustrated by a doctor who wrote: "Having been in practice here for the last 40 years, I have never even met my three district M.O.H.s. As chairman of the local medical committee I occasionally meet the county M.O.H. at committee meetings."

3. Midwives and District Nurses

Among the professional relationships included in this series of questions were those with midwives, district nurses, and health visitors. The first two were combined in one question, while the question concerning health visitors was addressed to a different group of practitioners.

The duties of midwife and district nurse are frequently carried out by the same person, but for the purpose of the present analysis they have been treated separately. The

replies of 310 practitioners showed that for 63% no change in relationships with midwives had occurred since July, 1948, for 8% they had improved, and for 11% they had deteriorated. In the case of district nurses the respective proportions were 76% no change, 12% improved, and 6% deteriorated.

The figures suggest that deterioration has occurred in the relations with midwives to a greater extent than with district nurses, the most frequent complaint being the lack of co-operation from midwives. Two doctors state that cases booked by them are taken by midwives, and another writes: "Less antenatal co-operation. Not only do the midwives dislike a general practitioner being 'booked' for a confinement; in some instances they actively try to dissuade the patient from doing so. We do not get the support of the divisional M.O.H. to the extent to which we are entitled. Little or no co-operation from antenatal clinic." Another reports that "midwives since the advent of gas-and-air appliances have taken over practically all midwifery, and even where one is expected by the patient to attend, the nurses confiscate practically all cases. There is also a complaint that midwives seem to resent a doctor's attendance at the confinement. 'I think midwives rather tend to resent doctors attending normal cases and would rather we only attended the abnormal.'" The deterioration specified by one doctor was that "midwives tend not to call me when I have specifically stated I wished to be called; they tend to ignore a lacerated perineum in unbooked cases, leaving the mother with a weakened 'frame.'"

The restriction of the scope of the general practitioner in midwifery is commented on by seven doctors, mainly because most women are confined in hospital. "In this district patients who have no facilities for confinement at home and cannot afford a private nursing home are forced to attend the local clinic in order to get into the county maternity home. The G.P. is out of the picture of this. I do not approve." "Almost all midwifery done in maternity home. Since State took over control scope has been restricted by consultants with some loss of status for G.P.s. More 'B.B.A.s.' and divided authority over patients *re* care and treatment."

Several of the doctors who reported good relations with midwives added that they had worked with the same women for many years. Two remarked that the younger ones seemed less co-operative.

Among the practitioners who amplified their statements that relations with midwives were good was the doctor who wrote: "The relationship with midwives is excellent in this practice. Three reasons I would put forward: (1) teamwork spirit; (2) prompt attendance at calls from midwives; (3) insistence on being present at birth in all booked cases." Specified improvements included the attendance of the midwife at the doctor's antenatal clinic.

There was less comment on relations with district nurses. Examples of improvement are quoted by a doctor whom the district nurse helps in giving liver injections, and by one who writes: "More help now given in country districts by district nurses, especially with post-operation daily dressings and injections for diabetics, pernicious anaemia, etc." Complaints are that district nurses are less willing now to take responsibility; that "frequently off-duty, half-days, full days, and week-ends" result in loss of contact and interference with the continuity of treatment; and that "too many unnecessary demands are made on the nurses, so they are often impatient."

One doctor thinks that "centralization of authority for appointment and general discipline seems to work less well than the old system of local nursing association." The administrative arrangements are criticized by a practitioner who replied "No change": "Whilst the service is less, as ever the personal contact with the nurse is less, due to the increased work done by nurses and their interference with the continuity of treatment; and that 'too change of duties resulting in their not being confined so rigidly to one district.'"

4. Health Visitors

The replies of a group of practitioners to the question whether their relations with the health visitors were satisfactory to them showed that among 334 practitioners the relations for 56% were satisfactory and for 20% unsatisfactory, while 24% had little or no contact with health visitors.

Most of the comments came from those practitioners whose relations with health visitors were unsatisfactory. Among those whose relations were good, two stated that they found health visitors useful in instructing young mothers in the care of their babies. As one doctor pointed out, "Good health visitors are very helpful; bad ones are a menace."

One of the most frequent complaints is the over-emphasis which health visitors place on attendance at clinics, even when the patient is being attended by a general practitioner. For example: "An effort is made to wean the patients to the clinics for vaccination and immunization, and it was recently suggested to a patient of mine that she was a 'bad mother' because she did not attend the clinic with her infant." "I hold my own antenatal clinic. The local health visitor tries to tell the patients that, though they come to me, they must attend the public clinic as well."

To some health visitors the "doctor" is the doctor at the clinic, not the general practitioner. "If I approach health visitors they are as a rule helpful, but they never seem to seek contact with the general practitioner or appear to be conscious of his or her part in the general scheme of things. To them a doctor seems to be the clinic doctor. I feel there should be more co-operation."

Thirty-eight doctors, specifying the unsatisfactory character of their relations with health visitors, complained that these women gave medical advice, often incorrect or in conflict with the general practitioner's treatment, and by their interference undermined the doctor's authority with his patient. As an example of the harm which can be caused by health visitors giving medical advice, a practitioner quotes a recent experience in a chicken-pox epidemic. "The health visitors have insisted on a return to school in 14 days and all contacts going to school; this was against my advice of three weeks roughly, until all the crusts had come away. As a result we had a widespread epidemic." A woman doctor writes: "The local health visitor recently told the mother of one of my backward, rather obese children, aged 15 months, who was slow in walking and whom I had ordered massage and exercise for his leg and back muscles, that the child had a T.B. hip and I had missed it!" The conflicting advice complained of often concerns infant feeding. For example, a doctor states that "one health visitor changed a baby's feed when I was in attendance because of difficulty of child's feeding (duration between my visits was three days)."

The annoyance caused to general practitioners by the conduct of some health visitors is expressed in such replies as:

"These persons are often officious, impertinent to patients, and ask questions about treatment which have nothing to do with them. I have even had suggestions made to patients by them! I will not tolerate interference by such people."

"Health visitors have visited patients who are under the immediate care of their own doctor, and on ascertaining this fact have persisted in their inquiries and visits, regardless of the fact that adequate supervision and advice is being given by the patient's own doctor. Furthermore, a conflict of views or suggestions *re* treatment is not calculated to improve the patient's peace of mind. It is suggested that such visits should only start either at the doctor's request or when he is no longer in regular attendance."

From the comments on the lack of co-operation the following illustration may be quoted: "I have no contact at all with health visitors. I have never met one. I am never informed when they intend to visit my patients. I have sometimes found that their advice on infant feeding in a particular case is wrong, and have had to overrule it as tact-

fully as possible, but there are no facilities for discussing the case with the visitor." Three doctors refer to the waste of their time in having to reassure patients who have been given contradictory advice or been caused needless anxiety by health visitors, "such that panic and quite unnecessary calls and consultations are made, increasing the G.P.'s work."

Twenty doctors thought that health visitors fulfilled no useful function or that the system was a waste of money.

Two practitioners remarked on the influence of health visitors in connexion with admissions to hospital. One writes: "I cannot understand why a health visitor can get a chronic patient into hospital fairly soon while I fail to do so." The other states that "when a patient is notified for removal to hospital, the health visitor is sent and on her recommendation, either way, the patient is admitted into hospital or not."

5. Consultants

Close contact and mutual understanding between general practitioners and consultants are essential to the efficient conduct of medical practice. Fears have been expressed that, since the introduction of the N.H.S., the relations between these two main branches of the profession have become less personal or more official. A series of questions put to groups of general practitioners was designed to ascertain whether there are grounds for such fears and what difficulties, if any, general practitioners experience in their relations with consultants.

(a) Personal Contact with Consultants

One group of general practitioners were asked whether their direct and personal contact with consultants had undergone any change since July, 1948. 360 replied. About half of those who were in a position to compare present conditions with those prevailing before July, 1948, found that no change had taken place in the degree of their contact with the consultants, and one-third found that they had less contact than formerly. Of the 55 practitioners who stated that they had more contact than formerly, 23 attributed the increase to the system of domiciliary consultations available in the N.H.S.

That more contact with consultants is not necessarily good for general practice was illustrated by a doctor who wrote: "Yes. But to the deterioration of the general practitioner. Formerly I could do my own x-ray work, minor operations—order physiotherapy, massage, and other treatments—under my own supervision at our small hospital. Now I have to send all of the above troubles to organized clinics which are grossly overcrowded—where they are crammed by visiting consultants. The entire system is deplorable. I am frustrated, losing interest, and ashamed of being akin to a grocer's assistant, making notes for consultants to deal with flatfoot, whitlows, fibrositis, etc."

Some doctors felt that, although there was more contact with consultants, it was less intimate. One wrote: "Domiciliary visits arranged through a consultant bureau, with an impersonal report and a form to fill up days later, are a poor substitute for a real consultation with a colleague by the patient's bedside; cases referred to hospital O.P. clinics are also dealt with impersonally."

For some general practitioners loss of direct contact with consultants has been accompanied by the disappearance of the former friendly relations. A practitioner wrote: "Consultants are now appointed on an area basis, and one makes little professional and no social contact with them—they are no longer one's friends. They have no local loyalty (as in a voluntary hospital) and their sessions are too infrequent for continuous care of in-patients." Another reports: "These new specialists seem to consider they are superior officers and to treat general practitioners as orderlies. Therefore I avoid them as much as possible."

The fact that consultants do not now need to depend upon the good will of general practitioners for their livelihood was mentioned by five doctors. For example, "Consultants are less dependent on private practice and less inclined to

bother with contacts. Far more consultants are more or less full-time and their income depends less on their own efforts. The personal factor counts so much in everything."

Seven doctors referred to domiciliary consultations without the presence of the general practitioner, one of the reasons for the increasing number of such consultations being the difficulty of arranging a time convenient for both consultant and general practitioner. On the other hand, eleven stated that they had no time to attend consultations.

The reference of more patients, often at their own request, to hospital out-patient departments has modified the relations between consultant and general practitioner. Of the nine practitioners who mentioned this factor, eight replied that it made contact less personal and direct, and one that it resulted in more contact, though it was also more indirect. A doctor writes: "Less contact, as all patients want their specialist through the out-patients department of hospitals. I hardly ever appear at a consultation to discuss a case personally with a specialist."

In the out-patient departments patients sent for consultations are frequently seen by registrars or juniors, and this was quoted by six doctors as a cause of loss of contact with consultants. For example, "Patients sent with letters to hospital O.P. are generally seen by registrars unless one happens to know the consultant personally and addresses a letter to the individual. The opinion of a registrar is not of the same value as that of a consultant, especially to a senior practitioner."

In another group of general practitioners, who were asked whether there had been any improvement or deterioration in their relations with consultants since July, 1948, about two-thirds of those who gave a definite reply stated that no change had occurred in their relations with consultants since July, 1948. Sixteen of them added that these relations were cordial and friendly. For 23% of those giving a definite reply, relations had deteriorated.

The comment is much the same as that on the question just considered. A few remarks which give a fresh angle are selected for quotation:

"Prior to 1948 I had all the means at my disposal to fully investigate my cases. The function of a consultant physician was judicial. A consultation in private practice gave opportunity to reassess the evidence. The great clinicians are a 'dying race.' We now send our cases to young men at hospital to set the x-ray department and clinical laboratory in motion. They rarely 'consult' with the G.P."

"From my point of view, specialists take no great personal interest in the patient as an individual. Letters take a long time to come. The consultants seem to regard the G.P. as a necessary evil."

"Deterioration in that there is a tendency among consultants to send brief instructions back, rather than an opinion."

"The difference is subtle and hard to define. I am still on the very best of terms with our local consultants, as before, but somehow there is a difference. In the old days one used to ring them up constantly and discuss cases and people. Now one feels they are no longer dependent on us, and they seem to be so much taken up with clinics here, there, and everywhere, and somehow one doesn't like to bother them."

To the question "Have you any complaints to make of the attitude of consultants and specialists towards you?" replies were received from 362 practitioners, 88% of whom said that they had no complaints.

To the further question asking the practitioners whether they had observed any alteration of attitude since July, 1948, replies came from 359. Of those who were able to make a comparison 83% had no complaints to make against the attitude of consultants toward them. Seventeen added a remark to the effect that their relations were friendly and co-operative; four of those who replied "Yes" to the second part of the question stated that the change was in the direction of improvement. One of these stated that he now received more letters "during continued treatment by consultants"; one observed that the obstetrics and gynaecological services had much improved; and one found consultants "rather more obliging." The other wrote: "They,

or many of them, are more aware of the problems and the importance of good general practitioners and seem willing to make efforts to improve general practice." A few who replied "Yes" did not specify whether the alteration was in the direction of improvement or of deterioration.

It is convenient to treat the adverse comment in the two parts of the question together. The complaint most frequently made (29 replies) concerned the failure of consultants to keep the general practitioner informed of the patient's progress while in hospital or of discharge or death, and the inadequacy of reports which were sent. The latter replies included statements that the general practitioner was not given a full report on the results of investigations or of the findings at operation, and he was consequently at a disadvantage when subsequently consulted by the patient. A doctor wrote: "Patients returning from hospital after operation are followed, perhaps a week later, by a printed form initiated by the H.S., merely giving a one-word diagnosis such as 'laparotomy.' No full letter from the specialist ever comes; most unsatisfactory."

In summary, it may be said that for the majority of practitioners their degree of personal contact with consultants is satisfactory, and the system of domiciliary consultations under the N.H.S. is valued. Where deterioration of relations has occurred it is attributed by some practitioners to the fact that patients are frequently seen by a registrar or a junior consultant and not by the consultant whose opinion is desired. Contact thus becomes more impersonal and the former friendly relations have been lost. Some general practitioners fear that the former friendly relations have been damaged by the fact that, under the N.H.S., consultants are no longer dependent upon the good will of the general practitioner for their income.

(b) Attendance of General Practitioners at Consultations

The figures below show the replies of a group of general practitioners to a question asking whether they customarily attended with their patients at consultations before July, 1948, and whether they do so now.

Consultations at Hospital					
	Total	Yes %	No %	Not in Practice before July, 1948	%
Before July, 1948	329	94 28	200 61	35	11
Since July, 1948	303	54 17	249 83	—	—

Domiciliary Consultations					
	Total	Yes %	No %	Not in Practice before July, 1948	%
Before July, 1948	329	284 86	10 3	35	11
Since July, 1948	311	295 95	16 5	—	—

The only comment to record is the following:

"In my opinion consultants and specialists in local hospitals pay too little attention to the local practitioners and their difficulties. In no local hospital do any facilities exist for attending along with patients. In addition, I can see no intention or desire by the specialists to have the practitioners present along with patients."

(c) Exclusiveness of Specialties

In order to ascertain, if possible, what general practitioners felt to be the causes of any deterioration in their relationship with consultants, five groups were questioned on possible specific causes. Thus the first group of general practitioners in this series were asked whether they found any tendency to exclusiveness among the specialties which diminished the contact and understanding between consultant and general practitioner. 343 practitioners replied, 324 giving a definite reply. Of the latter 30% found this to be a cause of diminishing contact, and 70% did not.

A doctor who replied "No" thought that the statement in the question had been repeated so often, though without evidence, that it had become accepted as a fact. The preponderance of negative replies suggests that "exclusiveness" among the specialties does not affect general practice adversely to any considerable degree.

Where it does have an effect, however, it can produce irritation and delay. For example, "There is a tendency to confine an examination of a patient to a particular specialty. A fresh appointment seems necessary for each system of the body. In the past a patient was examined completely when sent for an investigation." "Most particularly there appears to be no co-operation between one specialist department in hospital and another. The patient is constantly sent back to me to be sent to another at the same hospital. Common sense would direct the patient to all necessary departments at first instance. The result is weeks of delay for full investigations in all out-patients."

Another effect is the diminishing number of general consultants. A doctor who replied "No" added: "I still use in the main the consultants whom I have known for many years, and would only say that with increasing subdivision of specialties it is more difficult to find a consultant able to take a sound all-round view of a case, as the great physicians of the past seemed able to do. This is due to changes in medicine rather than deterioration in quality, and throws on the G.P. the increasing onus to correlate the contribution of different specialists and advise the patient himself."

Much of the comment in this group concerned the "exclusiveness" of consultants as a class and the degree of contact between them and general practitioners.

General practitioners' feelings about lack of courtesy from consultants are illustrated by the following comment: "Many consultants now exercise much less care or even courtesy in reference to the practitioner. The patient's confidence in his own doctor is of much more value to him in the long run than the occasional 'cleverness' of a consultant. This confidence is in the best interest of the patient and should be fostered and not destroyed."

(d) Effect of Alleged Decline in Numbers of the General Consulting Physician or Surgeon

It is sometimes suggested that the general consulting physician and the general consulting surgeon are gradually disappearing and are being replaced by consultants who specialize in a particular part or system of the body. It is said that this development is detrimental to medical practice. The group of general practitioners who were asked whether such a change was affecting the relationship between them and their consultant colleagues replied as follows: Yes, 13%; No, 29%; General consultants still available to 58%.

The replies indicate that the majority of general practitioners in the group are still able to consult general physicians and general surgeons and that any narrowing of the practice of consultants has not had repercussions on general practice.

(e) Premature Specialist Training

The replies of the group of general practitioners to whom was put the question, "Do you find that the fact that intensive specialist training begins immediately after registration has any effect upon the personal contact and understanding between consultant and general practitioner?" indicate that there is a strong feeling among them that the value of the help they obtain from the younger consultants is limited because the consultants, having had no experience of general practice, fail to appreciate the character of that branch of practice and the difficulties of the general practitioner. The response was as follows: Yes, 55%; No, 28%; No opinion, 17%.

The comment showed that, with one exception, the effect was considered to be adverse. The most frequent com-

plaint was that consultants do not appreciate the general practitioner's conditions of work, his problems and difficulties, or his point of view. It may be illustrated by a short series of comments:

"Less appreciation, especially by the young consultant, of the general practitioner's contribution to the history of the illness and background of the patient, to the patient's detriment; and, frequently, inadequate reports to the G.P., often leaving out the valuable and significant points from the G.P.'s point of view, and often not recognizing the G.P.'s rights and interests in the clinical side of the case, also to the patient's detriment. A widening gulf between the young consultant and the G.P., leading to a lack of mutual understanding and less incentive to the G.P. to approach and discuss the case with the consultant. If the G.P. has reasons to disagree with the consultant's opinion, in the patient's interest he is not given much opportunity to do so."

"The younger consultant who has obviously done little or no general practice has little idea of conditions under which G.P.s work; and is occasionally apt to prescribe treatment which is too elaborate and time-consuming to be carried out efficiently in a busy practice and under conditions which are rather far removed from the asepsis and efficient nursing found in a hospital environment."

"I feel that the average consultant does not appreciate the lack of facilities, the pressure of work, or the time wasted on trivial ailments that the G.P. has to contend with. Some consultants waste a lot of time in giving a long history of the patient in their reports to the G.P. of which he is already fully aware and has in most cases already given to them in his letters."

"The younger consultant is now much more detached, and often seems to ignore the fact that the G.P. is a colleague who seeks assistance but not instruction."

Another complaint is that consultants lack appreciation of the environmental factors, including home conditions, in a patient's illness. They tend to treat the patient as a "disease" or a "case" rather than as a human being. For example:

"It does prevent the specialist from viewing the patient *he* sees as a whole complete picture, including family background, environment, etc. It also prevents him from understanding human conditions and ailments not met with in hospitals or in textbooks. He only sees a minute fragment of the general make-up of the patient. He has little or no knowledge of general practice from the inside. To him the patient is a number, to the G.P.—a living and ailing entity."

"Some of the *younger* consultants do not seem to realize that what may seem routine investigation to them appears to the patient and his relatives as a vital operation in which the patient, and not the consultant, plays the leading role."

Several practitioners remarked that the consultant seemed to be becoming a "specialist" rather than a "consultant." One expressed the view that consultants placed too much reliance upon "photographic and mechanical investigations," and another stated that "many of the newer consultants seem to be technicians. They lack the breadth of view and, often, the cultural background of the older consultants."

Many doctors in the group are of the opinion that all prospective consultants should be required to have some experience of general practice. The periods suggested vary between six months and five years. One doctor thinks it should be spent "in one of the dirtier and more over-populated industrial areas." "An enforced period in general practice before specializing would give the specialist an understanding and appreciation of the work of the general practitioner, and an insight into home conditions and mode of life of patients. The general practitioner would then cease to be, in his opinion, merely an intermediary, and the patient would be a human being and not a number as at present." It would also, in the view of another doctor, enable the consultant to see the kind of help the general practitioner needs from the consultant.

Finally, a practitioner makes the following comment: "From my personal experience relations with consultants have been entirely harmonious. For this state of affairs to exist either the general practitioner must have considerable postgraduate hospital experience or the consultant *real experience* of general practice."

(f) General-practitioner Clinical Assistantships

Another group of general practitioners were asked, "Do you find that personal contact and understanding between consultants and general practitioners have been diminished by lack of opportunities for general practitioners to become consultants, for example, through clinical assistantships in hospitals?" Of the 352 who responded, 30% replied "Yes," 44% replied "No," and 26% had no definite opinion.

The lack of opportunity referred to in the question does not seem to disturb general practitioners to any great extent. Several of those who replied "Yes" observed that it was a less important cause than some others in separating these two branches of the profession. Some of the comments related to other causes of the loss of contact with consultants which have been dealt with by other questions.

Of the practitioners who replied three were clinical assistants, nine had appointments on the staffs of local hospitals, and one was an S.H.M.O. Five had formerly had access to the local hospital, and four had had to surrender clinical assistantships or other appointments.

One doctor wrote: "I would welcome clinical assistantship at hospital on sessional basis as the best idea yet put forward to restore the clinical status and interest of the G.P." One amplifies his negative reply: "Personal contact and understanding have not, in my opinion, diminished, but lack of contact with hospitals, owing to pressure of work, has increased. This makes it more difficult for the general practitioner to keep up to date with the march of medicine and so he is less conversant than he should be with what can be done by modern treatment for cases hitherto incurable. Clinical assistantships would help, but time must be found for them." Seven other practitioners, six of whom replied "Yes," stated that the general practitioner would have no time to visit hospitals. A doctor replying "Yes" added that "consultants have no time for clinical assistants who rank between registrars and junior housemen."

Two other opinions, both in the affirmative, may be quoted: "The standard of medicine in a particular area is much higher if the G.P.s are on the staffs of smaller hospitals—and their contact with the consultants contributes a great deal to their mutual benefit." "Lack of assistantships means less work in the hospital, much of which is undertaken by newly qualified men with less experience with the growing feeling that the G.P. cannot tackle even the simplest work."

The loss of the local hospital as a common meeting-ground was mentioned by two doctors, both replying "Yes": "Chiefly through loss of the personal touch which was fostered by the hospital being a common meeting-ground. The hospital now tends to be another Government administrative unit."

A practitioner replying "Yes," adds: "As Secretary of the Group Medical Committee I am very aware of this problem. We have recently elected to our committee a general practitioner (chairman of the local medical committee) to improve liaison."

(g) Administrative Separation of Regional Hospital Boards and Local Executive Councils

The last question in this series asked a group of general practitioners whether they found that "personal contact and understanding between consultants and general practitioners have been affected by the administrative separation, in the National Health Service, of the spheres of the regional hospital boards and the local executive councils." About one-half of the 355 doctors replying to the question stated that this administrative arrangement had had no effect on their personal contact with consultants. For one-third, personal contact had been diminished. Little comment was included in the replies.

IV. HOSPITAL FACILITIES FOR GENERAL PRACTITIONERS

Effect of National Health Service

A group of general practitioners were asked whether they undertook any hospital work immediately prior to July, 1948, and whether they undertake any now. Their replies are tabulated below:

	Total	No	%	Yes	%	Not in Practice	%
Before July, 1948	336	181	54	122	36	33	10
At July, 1951	301	210	70	91	30	—	—

Differences between Town and Country (among those replying "Yes" or "No")

	Town		Country	
	No.	%	No.	%
Before July, 1948:				
Yes	72	35	50	53
No	137	65	44	47
Total	209	100	94	100
At July, 1951:				
Yes	52	25	39	42
No	156	75	54	58
Total	208	100	93	100

Private Practitioners

The private practitioners who were asked this question replied as follows:

	Total	No	%	Yes	%
Before July, 1948	13	8	62	5	38
At July, 1951	6	3	50	3	50

General-practitioner Beds

It is part of the Association's hospital policy that beds in local hospitals should be available to general practitioners for the treatment by them of their own patients for conditions which are within the province of general practice. A group of general practitioners were asked questions designed to ascertain to what extent this facility was available to them and, if they had no such facility, whether they felt that their practice thereby suffered. The following tables show the result.

Access to General-practitioner Beds	Total	Yes	%	No	%	Not in Practice before July, 1948	%
Before July, 1948	373	117	32	222	59	34	9
At July, 1951	367	103	28	264	72	—	—

Of the 246 practitioners who had no access to general-practitioner beds and replied to a further question asking whether their practices thereby suffered, 24% said that they did suffer and 76% that they did not.

Differences between town and country are tabulated in the next column.

The replies show (i) that access to general-practitioner beds is not yet a customary feature of general practice; (ii) that the proportion of general practitioners enjoying the amenity is rather less than before July, 1948; (iii) that the proportion of practitioners with beds is higher in the country than in the towns; and (iv) that the majority of those who have no general-practitioner beds are not conscious of any adverse effect on their practices. Ten practitioners who have no general-practitioner beds indicated in their replies that they would like to have them. Six stated

	Town		Country	
	No.	%	No.	%
Before July, 1948:				
Yes	62	28	55	47
No	159	72	63	53
Total	221	100	118	100
At July, 1951:				
Yes	52	22	51	39
No	185	78	79	61
Total	237	100	130	100
Whether practice suffers by lack of beds:				
Yes	39	23	21	28
No	131	77	55	72
Total	170	100	76	100

that, although they have no beds, they visit their patients in hospital and discuss their progress and treatment with the consultants in charge.

One of the latter writes: "Knowing the medical and surgical staff and counting them as friends, I am perfectly at liberty to see my patients in hospital beds and can agree or disagree with investigations and/or treatment. We enjoy arguing about our cases and suggest (frequently) further investigations and treatment."

A practitioner who appreciates the advantages of general-practitioner beds doubts the attitude of his patients: "This practice was established sixty years ago, and the patients have always expected to be treated by specialists and 'students' in large general hospitals. They have never expected their family doctor, to whom they come for advice on all sorts of matters, to be associated in any way with their treatment in hospital. They would need to be educated along such lines if access were established in this region. My practice, therefore, does not suffer so far as my patients are concerned, but it does with respect to myself, for I find the treatment of many cases, with which I could deal, being taken out of my hands."

A doctor who has general-practitioner beds now, but did not have them before July, 1948, writes: "Little doubt exists in my mind of the superiority of general practice with access to beds in a local-practitioner hospital to that of practising where no such facilities exist." One practitioner who has never had beds and states that his practice thereby suffers adds: "I think that the principles of G.P.s having access to beds in local hospitals is the only way to keep up a high standard in general practice. I feel very strongly on this."

Several doctors replied that, although they could not say that their practices actually suffered, they were aware that access to general-practitioner beds offered advantages both for themselves and for their patients, such as continuity of care during hospital treatment, the sustaining of the practitioner's clinical interest, and the improvement of his skill and knowledge. "The practice does not suffer, as the hospitalized patients receive adequate attention, but one suffers oneself in 'losing' many medically interesting cases which, had the facilities been available, one could have treated oneself, retaining skill and interest."

The value of general-practitioner beds was summed up by a doctor who sent the following remarks: "I can only compare my present practice with (a) a practice in which I was first a locum and later an assistant, with G.P. beds, and (b) what I can do for my private patients in a good local nursing-home."

"1. *Surgical*.—I lose touch with the actual appearances of surgical pathology in my N.H.S. patients by not assisting at operation on lesions which I have tried to diagnose. This also adversely affects my after-treatment in a subtle way, (a) by loss of contact with their post-operative progress, and (b) by not always knowing when they come out of hospital."

"2. *Diagnostic*.—I do not usually see hospital x-ray films unless specifically asked for. (In this case they are always sent to

By far the most frequent difficulty mentioned was that caused by delay in obtaining appointments for hospital con-

sultations. One doctor described it thus: "I do not know if the hospital out-patient departments are crowded with minor cases, but my practice is hampered by the long wait for appointments and again for re-examination, because if a patient has to wait two, three, four, or five weeks that patient has to be visited and observed although both the patient and I know that nothing can be usefully done until the investigation or examination at hospital has been done first."

Although he could not say whether it was due to overcrowding, another practitioner stated that patients saw different doctors at each visit to some hospitals in his area. This resulted in lack of continuity and disturbed both his interest and his treatment of the patient.

One doctor suggested that "there should be some clinic for minor complaints, especially surgical—for example, lipomata requiring removal, renewal of surgical appliances: this would relieve the congestion at the main clinic." Another wrote: "There appears to be a need for urgent (not emergency) hospital consultation as a halfway house between domiciliary visit and ordinary four-weeks wait for hospital consultation."

Unnecessary Transport for Patients

It was suggested to the Committee that in some areas hospitals provided transport to convey patients to hospital for follow-up treatment which should properly fall within the province of the general practitioner. This, it was stated, was resented by the doctor as a form of encroachment. On the evidence, however, of the replies to a question on the subject put to a group of general practitioners, this procedure does not appear to be causing any serious disturbance to general practice, for 81% of the 339 who replied had no complaint to make, and the comment of some of those who replied in the affirmative showed that they were referring rather to the general question of follow-up treatment by hospitals than to the specific point of the question—namely, the collection of the patients by hospital transport.

Adverse Criticism of General Practitioners by Hospital Staffs

A group of general practitioners were asked whether, in their experience, members of hospital staffs, including almoners, gave patients the impression that better treatment could be obtained at a hospital than from a general practitioner. The result shows that 20% of the 371 practitioners who replied have some cause for complaint in this respect, though a few added that it was only occasional. Seven stated that only junior hospital staff were guilty of this fault, and two attributed it to nursing and lay staff. Three stated that it applied only to maternity departments.

For the attitude of some of the junior staff one doctor thought medical teachers were responsible: "As a medical student one was (and I expect still is) initiated into this attitude towards the G.P. by certain teachers, and as a houseman one may or may not (but very probably will) indulge one's self-importance in this way. I do not expect conditions in teaching hospitals have much altered recently."

A doctor who was doubtful of the value of patients' statements remarked that there were no means of verifying the factual correctness of such statements.

Some practitioners who answered "No" or "No knowledge" believed that the impression existed among patients, though not for the reason suggested in the question. Among these other reasons were N.H.S. propaganda, the frequency of reporting back to the hospital for follow-up treatment or inspection, and the knowledge of patients that general practitioners have no time for full examinations. "I think there is a general feeling among the more intelligent patients that, as a class, G.P.s are so overworked that they cannot expect much attention. If they suspect anything seriously wrong there is a definite tendency to just request a letter for hospital with no preliminary examination." "The

Government practice of issuing lists of practitioners in post offices, etc., without any letters after their names tends to lower prestige in eyes of public."

Waits for Minor Operations

The group of general practitioners who were asked to state whether patients referred by them to hospital out-patient departments for minor operations had to wait long before the operation was performed replied as follows:

Replies	Total	%
No	178	55
Yes	145	45
Reply indefinite	4	1
Total replies	323	100

Average Length of Wait, where Specified	Total	Average Length of Wait, where Specified, for Tonsillectomies Only	Total
Up to 2 weeks	2	3-6 months	4
2-4 weeks	7	6-9 "	12
1-2 months	14	9-12 "	10
2-4 "	19	12-18 "	7
4-6 "	30	18-24 "	5
6-9 "	21	2-3 years	4
9-12 "	19	3-4 "	
1-2 years	12		

Of those practitioners who replied that there was no wait, 26 added that they themselves performed most of their minor surgery either in their own surgeries or in local or cottage hospitals. Of these 18 were in rural partnership practice.

The most frequently mentioned suggestion for reducing the waiting period was the encouragement of general practitioners to undertake more minor surgery. This might be done by allowing them a special fee for minor operations for their own patients and/or by allowing them to participate in hospital work of this type. The direct access of general practitioners to pathological and x ray facilities was also suggested.

Among the difficulties encountered, apart from a shortage of hospital staff, was the absence of proper selection of cases from the waiting-lists. A doctor wrote: "There does not seem to be any selective method of choosing patients from the waiting-list; for example, a patient of mine with a hernia which was giving a lot of pain and had heavy work had to wait six months. He either had to keep lifting or stop work and starve. Too many cases are being seen by registrars who regard the patients as 'cases' and not as persons who work and have families to support. They have academic and clinical skill, but none of the common sense and experience of people that the G.P. has. They are also over-specialized in their own branches, and to them a hernia is of no interest and is put 'on the list' automatically and forgotten." The comment of another doctor was: "Hospitals vary in length of waiting-time; but the reason usually is that 'interesting' cases (that is, cases which are good for teaching or investigating) are admitted before those cases which are 'ordinary' but causing inconvenience to the patient."

Waits for Admission to Beds

The tables below summarize the information received in reply to a question asking a group of general practitioners whether their patients had to wait for admission to various groups of hospital beds:

1. Hospitals: Ordinary Cases			
Replies	Total	%	Length of Wait, where Specified
No	51	16	1-7 days
Yes	268	84	1-4 weeks
Reply indefinite	2	—	1-3 months
Total replies	321	100	3-6 "
			6-12 "
			6-24 "
			12-24 "

2. Hospitals: Semi-urgent Cases

Replies	Total	%	Length of Wait, where Specified
No	109	34	1-7 days
Yes	208	65	1-4 weeks
Reply indefinite	4	1	10 days-6 weeks
Total replies	321	100	1-3 months
			3-6 "
			6-12 "

3. Beds in Sanatoria

Replies	Total	%	Length of Wait, where Specified
No	22	7	1-4 weeks
Yes	280	87	1-3 months
Reply indefinite	19	6	3-6 "
or no experience			6-12 "
Total replies	321	100	1-2 years

4. Beds for the Chronic Sick

Replies	Total	%	Length of Wait, where Specified
No	13	4	1-7 days
Yes	305	95	1-4 weeks
Reply indefinite	3	1	1-3 months
Total replies	321	100	3-6 "
			6 months-2 years
			3 years
			Indefinitely

Emergency Admissions

A group of general practitioners were asked whether they experienced difficulty in obtaining hospital beds for emergency cases. Of the 385 who replied one-half found no difficulty. A further 36% found occasional difficulty.

On the whole it is usually possible to obtain a hospital bed for an emergency case, though sometimes admission may be achieved only after an expenditure of much time and effort by the general practitioner. The difficulty most frequently mentioned (17 replies) was that of making use of contact with a responsible officer at the hospital. The practitioners resented what one of them termed "a minor inquisition" by newly qualified house officers or having their applications dealt with by "a series of secretaries, porters, telephone operators, etc."

Twelve doctors suggested that beds which should be available for emergencies were "blocked" by their use for other purposes—for example, by specialist grouping, for the chronic sick and long-term cases, and for private patients. One of them amplified this as follows: "It is rarely possible to get a bed in the hospital of your choice—for example, local or teaching—and far too many cases under investigation at one hospital are admitted as emergencies to another (for example, cardiacs or perforated ulcers). This usually involves unnecessary investigations and expenditure of time and money by the hospitals. I think alternative but none the less essential arrangements should be made for the following types of cases blocking up hospital beds: (1) The sociological cases that cannot be nursed at home. (2) The terminal cases that cannot be nursed at home. (3) Cases undergoing routine hospital investigations as in-patients. (4) Cases awaiting disposal while room is found for them elsewhere."

The difficulty of defining an "emergency" sometimes results in differences of opinion between the general practitioner and the hospital officer. A doctor writes: "It is difficult to convey over the 'phone the nature of the emergency. A case diagnosed as 'acute bronchitis' in an afebrile patient over the age of 55 is in my experience a graver emergency than a pneumonia, yet this diagnosis does not carry enough emphasis to make admission by hospital more certain. G.P.s' requests for admission must be accepted as evidence of urgency unless the G.P. agrees to delay." Some of the difficulty of obtaining admission for elderly patients is due to the fear of the hospital authority that they may have to retain the patient as a chronic case when the acute illness has passed. A doctor writes: "The

difficulty arises mostly in winter and mostly for old people (70 or over), of whom there are very many in my region. There is a tendency of the bed bureau clerks (who, be it said, are most helpful and obliging when pressed) to fail to realize that over-70s can have acute illness from which they may recover and are not necessarily chronic cases."

In order to avoid the necessity of telephoning to a number of hospitals eight doctors recommend the establishment of a central bureau.

The appointment of a particular medical officer for an area with the responsibility of finding beds for all emergencies was suggested by three practitioners, and two recommended that if beds were not available temporary ones should be made up. Another suggested that "cases which a local G.P. feels are urgent should be admitted without question at least overnight, in a special 24-hour ward if necessary, and discharged, if hospital authorities think fit, next morning."

The Hampering of General Practice by Defects in Hospital Procedure

Eight groups of general practitioners were asked questions designed to ascertain whether general practice is hampered by any defects in hospital procedure.

Delayed Appointments

The tables below summarize the information received from a group of practitioners in reply to a question asking whether patients they referred to hospital for consultation had to wait for an appointment.

Is there Delay?			Length of Wait		
Replies	Total	%	Up to 1 week	2 weeks	19 cases
Yes	288	82	" 1-2 weeks	" 3-4 "	83
No	53	15	" 5-6 "	" 7-8 "	53
Varies	12	3	" 9-10 "	" 11-12 "	40
Total replies	353	100	" 13-14 "	" 15-16 "	7
			" 17-18 "	" 19-20 "	31
			" 21-22 "	" 23-24 "	16
			" 25-26 "	" 27-28 "	5
			" 29-30 "	" 31-32 "	6

The departments in which the longest delays occurred were stated to be the orthopaedic (66 replies), ear, nose, and throat (45), medical (30), and psychiatric (27).

In commenting on the length of the wait for an appointment three practitioners pointed out that after the initial wait for an appointment there was further delay before necessary specialist treatment or investigation was carried out. Secretarial delay might further lengthen the time that elapsed between the initial request for a consultation and the receipt of a report.

The length of wait may vary with the popularity and seniority of the consultant. One doctor estimates a wait of three or four weeks for "a good senior" and one week for a "junior." One doctor overcomes the difficulty by never specifying the name of a consultant. "Thus, for example, I ask for an appointment for 'a physician,' 'a surgeon,' 'a gynaecologist,' 'a throat consultant,' etc. This (a) ensures the patient gets the first available 'date,' (b) ensures the consultant is the least busy one at the hospital. I have pursued this line for years and so get a cross-section of all consultants and their views and methods (and can assess how much work they do!)." "The

The most frequently suggested cause of delay was that there were too few consultants and that they saw too few patients at each session. Comment which concerns methods of improvement includes the following: "It seems to me that the question is one of the attitude of approach to an appointments-system. It seems to me that such a system could be designed either (a) to improve the specialist's working conditions, or (b) to increase the patient's convenience. Regarding (a), we would all very much like to do better work by seeing fewer patients in a more leisurely way. But if the work is there to be done we have to scramble through

it as best we can. Whatever crowd is in his waiting-room the G.P. must see them all. In the past the hospital specialist had to do the same. He must now do it again. Regarding (b), if it can be arranged that a patient does not have to report at a hospital at 9 a.m. for a consultation at noon it should be arranged. This is the only proper purpose (under present conditions) of an appointments system. In my view every applicant for an appointment received by a given time (say 48 hours before a clinic) should be given an appointment for that week, at the available time divided up equally between the applicants. The consultant is then no worse off than without an appointments system, whilst the patient is better off. Carry-over from one week to another is almost bound to be cumulative, and should not be allowed." Other practitioners made a similar comparison between the general practitioner who, however hard pressed, must continue to work until he has finished and the consultant who sees patients only within the time limit of his session.

Appointments Systems

A group of general practitioners were asked whether an appointments system for out-patients operated in the hospitals in their localities, and, if so, whether it worked satisfactorily for their patients.

The replies of 370 practitioners indicate that most hospitals operate an appointments system, and that of these systems nearly 70% are reasonably satisfactory.

The main criticisms were that an appointments system creates a long waiting-list for consultations, which may be delayed for several weeks, and that, even though an appointed time may have been arranged, the patient still has to wait, sometimes for several hours, before he sees the consultant or his deputy. This waiting at the hospital is often due to the fact that many patients are given the same time of appointment.

The timing of sessions is sometimes inconvenient for patients. Five doctors mentioned the difficulties of country patients in reaching the hospital for an early morning session, and an urban doctor wrote: "Many patients attending O.P. departments are fit for their employment (for example, those attending for barium meals, massage, radiant heat, etc.) but remain incapacitated, as these special examinations, treatments, etc., can only be carried out during normal working hours (for example, between 9 a.m. and 5 p.m.). Suggest evening sessions."

A suggestion was made for a revised method of applying for a consultation: "In my opinion the easiest and best method is an application for appointment made on a form in part completed by the doctor and in part by the patient. The form is then posted by the patient in an official stamped envelope. Where the patient is left to 'phone the hospital for an appointment mistakes are common. If the doctor does this himself valuable time is wasted."

The following tribute was paid by a practitioner to the staff of his local hospital: "In so far as I am concerned, it may be placed on record that the O.P. system of the general hospital here is admirable. The specialists are a fine bunch, kind, tolerant, and helpful. They seem to take a personal interest in cases sent for their advice. My patients never fail to mention the fine impression left on them."

Delayed Reports

One group were asked whether they found that delay occurred between the discharge of a patient from hospital and the receipt of a report. Of the 387 practitioners who replied, 64% experienced such delay.

In considering the replies, however, allowance must be made for individual definitions of "delay." At least three practitioners answered "No" for reports which were received within a week, while of those who answered "Yes," 37 assessed the average delay up to one week, a few adding that this was not unreasonable. Of two

practitioners answering "Yes," one considered a delay of 7-10 days to be satisfactory, while the other found the same period "a source of annoyance to both doctor and patient." Specific periods quoted by practitioners answering "Yes" were as follows:

Delay up to 1 week	77	Delay up to 3 weeks	38
" " " 2 weeks	87	" " " 4 " "	9

Avoidable delay is attributed to secretarial routine and the failure of junior medical staff to appreciate the importance of reports to the general practitioner. Two practitioners refer to the delay caused when reports from several departments have to be co-ordinated. One finds teaching hospitals unsatisfactory in this respect: "As they are dealing with the unusual type of case this delay is particularly unfortunate. Occasionally the report on the 'follow-up examination' never comes at all."

A doctor who reports one to two weeks' delay states that he counteracts this by telephoning the R.S.O. or medical registrar in important cases: "the information so obtained is of more value than any written report." Another states: "Report from local hospital never received until I ring up to find out: (1) what was done; (2) when discharged."

A few suggestions for improving procedure are offered among the replies: "I can see no reason why every patient should not bring his discharge letter home with him. The saving in postage would even be worth while. A family doctor's letter always accompanies the patient, so it cannot be impossible to reciprocate." "I recommend most strongly that a patient who is to have a particular drug or treatment should either be given a proforma to show the practitioner, or given a sufficient supply of drugs to tide him over the period which must elapse before a report is sent out." "Might I suggest that when a patient dies in hospital the general practitioner should be notified immediately."

Notifications to General Practitioners

A group of practitioners were asked whether they were notified by the hospital if a patient sent for consultation was retained or sent to another department.

Only about 10% of the 345 replying fail to receive notifications, though many of those who replied in the affirmative categories added that notifications and reports were nevertheless much delayed.

A doctor replying "No" amplified his answer thus: "By and large, I am not notified if a patient is retained or transferred to another department. This does hamper me in my practice, in so far as one has got to question the relatives of the patients to find out what is going on. Also it does not inspire the patients' confidence in their own practitioner if he obviously does not know what is going on. Thirdly, one ultimately has to write to the consultant concerned in order to get the report required. Finally, operative procedure is often undertaken without the formal consent of the patient's own practitioner."

An example of the embarrassment caused by delayed notifications of discharge was given by one doctor: "Notification that a patient has been discharged from hospital is often most dilatory, sometimes 10-14 days elapsing before letter arrives. The patient is told on discharge that the doctor will visit in a few days, and is naturally annoyed when he does not come."

A doctor compared the methods of the larger hospital in his area, which does not notify, with a smaller hospital, which does: "The weakness in the hospitals is due to their large swollen staffs, both medical and clerical, working, it seems, on shifts with little continuity and less responsibility for the patient. This is a marked feature of the larger hospital. In the smaller hospital we are notified, and the standard of work, as far as it goes, is more satisfactory from our point of view than in the larger hospital."

VI. THE ORGANIZATION OF GENERAL PRACTICES

A series of questions was included in the review to obtain some information on doctors' methods of organizing their practices and on any changes which may have been necessitated by the introduction of the N.H.S. A report on the replies to another question concerning the effect of income on organization will be found in the next section.

1. The Effect of the N.H.S.

One group of general practitioners were asked whether the introduction of the N.H.S. had affected the organization of their practices, and a list of possible alterations was offered for them to mark "Yes" or "No."

Of the 315 practitioners who replied to the question on this subject, 36% had made no change in their organization as a consequence of the introduction of the N.H.S. The change most frequently mentioned was the employment of secretarial assistance, and next came the provision of new accommodation to meet the increased demands for service.

2. Non-medical Assistance in Surgeries

Of a group of 342 doctors, 63% employ some form of ancillary assistance in their surgeries, mainly clerical and secretarial. The help employed, however, was not always sufficient, and 162, or 48%, of the doctors who replied to the question felt handicapped by the absence of some particular form of help. Of the 126 doctors who had no help, 90 were thereby handicapped in their practice.

3. The Doctor's Wife

A separate question was devoted to the part played in the administration of the practice by the doctor's wife. The replies showed that in the practices of 277 married doctors the doctor's wife takes a considerable part in 39% and a moderate part in 58%. Only in 3% did she take no part at all.

4. Co-operative Arrangements for Relief

The Committee wished to ascertain to what extent neighbouring general practitioners co-operate to enable each of them to have some time off duty. A group of practitioners were asked whether they had any arrangements with neighbouring doctors or partners to permit some relief from duty, either regularly or occasionally, or arrangements for periods of holiday or illness. Of the 342 doctors who replied only 28, or 8%, have no arrangements whatever, and 17 of these are single-handed rural practitioners.

5. Employment of Locums

Of the 321 doctors who replied to a question asking whether they experienced difficulty in obtaining suitable locums, 57% had not needed to employ them. Difficulty had, however, been experienced by 86 doctors, or 29%. Among the 127 single-handed doctors who replied, 43, or 34%, had experienced difficulty.

6. Appointments Systems in General Practice

A group of general practitioners were asked whether they adopted an appointments system for all consultations or for private patients or special examinations. An appointments system for all consultations was adopted by only 8 out of 321 practitioners (2%) in the N.H.S. and by 5 out of 12 private practitioners. Among the N.H.S. practitioners 245, or 76%, arranged appointments for special examinations or, in some cases, for private patients.

An appointments system is rarely adopted in general practice. A few doctors in the group had tried it. One found that "patients had not the intelligence" to use it, and another stated that "on the whole 5 o'clock means any time between 5.30 and 7 in this area." A doctor wrote: "Appointments system was tried for 12 months. It worked well at first, but gradually the work increased up to 50% and the system was abused—discontinued when patients

complained they had to wait three hours if they had not previously made an appointment. Patients phoned at all hours of day and night for appointments for next day or in two to three weeks' time." An appointments system was considered to be administratively impracticable by a doctor who replied: "If we worked to an appointments system not one of three partners would ever be able to do any domiciliary visiting—our staff of three receptionists, etc., would have to be doubled, and a telephone exchange installed."

7. Health Centres

The Committee asked a group of practitioners whether they favoured, or did not favour, health centres as a basis for general practice for their areas or whether they were indifferent to the subject. Of the 362 who replied, 38% were in favour, 53% were against, and 9% were indifferent.

The majority opposed to the idea of health centres is maintained among both the town and the country groups and among all the age groups. The reason most frequently given for opposing health centres is the fear that such a basis of practice would disturb the doctor-patient relationship. "Health centres would mean the abolition of general practice and general practitioners. Space does not allow me to make this point clear, but it may suffice if I say the purpose of a doctor in a community is but little understood by the advocates of 'clinics and health centres.' We are little removed from the witchcraft of primitive societies, and to help the people to a way of life we should be with them, not apart, or separated by official centres." "Group practice—yes, but the essential of the G.P. is to see and advise his patients in his own surgery. The development of health centres and clinics, etc., would tend to take the patient away from the family doctor, who should be the friend and companion of his patients and not deal with them as mere numbers. The development of health centres is bound to make the contact impersonal."

The reason most frequently given by those who support the idea of health centres is that they would enable the doctor and his family to have more privacy in their own home.

Twelve doctors who replied that they were in favour of health centres added qualifications; for example, provided that the centres were conducted by the doctors themselves and not by an outside authority, or that they were better equipped than the average individual surgery. Three of them thought that, while health centres might raise the standard of medical practice, they might do so at the expense of the doctor-patient relationship.

Among those who were indifferent to the idea, a doctor wrote: "I do not think health centres would benefit the patients. They would enable G.P.s to have more leisure and their wives more freedom; but we would have to pay heavily for this (in cash). In this area any G.P. can have what leisure he wants, because there is no professional jealousy and we all willingly see each other's patients, etc., as it is now, and has been for many years." Another replied: "The answer depends too much on what solutions are found for other problems."

VII. WORK AND REMUNERATION IN THE NATIONAL HEALTH SERVICE

Although the Committee is not concerned with the actual amount of remuneration paid to general practitioners working in the N.H.S., it has endeavoured to obtain information on some aspects of the relation of professional income to services rendered and the effect of any inadequacy of income on the practitioner's efficiency.

It must be emphasized here once again that the inquiries from which these figures were obtained took place before the announcement and application of the Danckwerts award and of the recommendations of the

Working Party on the calculation and distribution of the Practitioners' Pool. It seems probable that the changes recently introduced will have affected these figures very considerably and will have restored, at any rate in part, some of the imbalances which they show.

1. Unnecessary Demands for Services

The series included three questions dealing, in a general way, with the amount of work required of practitioners in the N.H.S. The first asked a group of general practitioners whether unnecessary demands were made upon their time and services. Of the 351 who replied, 53% feel that excessive demands are made upon them to a considerable degree and 41% to a less degree.

Most of the practitioners who added comments stated that the excessive demands consisted of requests for treatment for trivial conditions and the demand for visits when the patient might be expected to attend the surgery. The next most frequent kind of excessive demand was the clerical work involved in issuing certificates and other forms. Some practitioners were especially irritated by the hindrance to their rounds when they were asked to prescribe for members of the family other than the patient visited, or when "buttonholed" by neighbours of the patient. To others the particular annoyance was the calls made unnecessarily late in the day or calls during the night which could wait until the morning.

Five doctors replied that there were a few unnecessary demands, but no more than before the introduction of the N.H.S.

From among the examples of unnecessary demands given by the doctors replying, three may be quoted:

"One Sunday in the middle of my lunch I received a message to come at once to a man who does get attacks of asthma. I left my meal to ruin and went immediately. His wife opened the door, looked rather startled, and said, 'I am sorry, we did not expect you yet, and he has gone out to have a drink.'"

"A patient attended at home with slight bronchitis sent for me two days later to ask was it in order for him to eat meat."

"Another woman asked me to visit her and wanted me, before doing so, to 'phone some of her friends in a town over twenty miles away and tell them she would not be there that day."

Several doctors made an estimate of the unnecessary demands on their time and services. One found that 5-10% of his patients were persistent offenders. Higher estimates include the following:

"50% of my 'visits' could attend the surgery, and 30% would never have seen a doctor if they had to pay."

"There is no doubt that 85% of the patients I see do not require medical attention."

"The practice has varied little in numbers for which it is at risk, yet I previously ran it alone, and now have a partner doing a full share of work and I give three times as many consultations and do twice as many visits as formerly. The increase is due to the influx of children and formerly uninsured women."

"At least 50% of my work in the surgery could be done by a qualified nurse."

Four doctors had disciplined their patients successfully, but another stated that he had lost patients since he had become firmer with them. One wrote: "I have tried to drill my patients, and I find that the exhibition of the B.M.A. notice on timing and urgency of calls is very valuable. This notice should be put up in every waiting-

room." Two found that unnecessary demands were reduced or eliminated through the help of a full-time secretary-receptionist or caretaker.

Two doctors mentioned the importance of recognizing that a condition which might seem trivial to the general practitioner might appear serious to the patient. "This is a difficult problem. We should not discourage patients consulting us with early symptoms of grave conditions. The average patient is not competent to decide the significance of certain symptoms."

The continuity of the insurance form of practice was mentioned. One doctor wrote: "In my district 'Club' medicine has been practised for many years, and both doctors and patients have become acclimatized to conditions rather similar to the present. The Health Service is not such a novelty to these patients as to those whose medical care was governed by financial factors." On the other hand, another replied: "This practice was almost entirely covered by colliery schemes or doctors' clubs before N.H.S., so the increase is not due to increased availability of attention without direct payment, but to an attitude that 'It's there for nothing, and that's what the doctors are for.' Tendency has much increased under N.H.S., and they will not bandage a cut finger for themselves."

2. Ex-Private Patients

It is sometimes alleged that many unnecessary demands come from those patients who formerly paid private fees for the services they required. The Committee therefore asked a group of practitioners: "Have you experienced any increase or decrease in the number of services required in the N.H.S. by patients who, before July, 1948, were your private patients?" Replies from 355 were as follows:

Replies	Total	%
No	20	6
Increase slight	74	21
Increase considerable	218	62
Decrease slight	7	2
Decrease considerable	3	1
Not in the practice before July, 1948	32	9
Answer irrelevant	1	—
Total replies	355	100

3. Relation between Income and Organization of Practice

A group of practitioners were asked whether they were able to organize their practices in the way they desired on the amount of remuneration they received. Their replies, which should be related to the summaries in Section VI (2), show that 72% of the 338 practitioners replying are handicapped by financial inability to organize their practices as they would wish. The most serious handicap is the absence of secretarial and other non-medical help. Others are unable to afford improvement or extensions of surgery or waiting-room accommodation or to buy new equipment, while some are unable to employ an assistant.

4. Effect of Financial Anxiety on Efficiency

A group of general practitioners were asked whether the efficiency of their practice was disturbed by personal anxiety about finance. A few of those who replied "No" seemed somewhat shocked at such a suggestion, but the number who replied in the affirmative shows that some reduction of efficiency on this ground does occur.

Of the 360 who replied, 64% feel that their efficiency is impaired, to some degree, by personal anxiety about finance. The causes of anxiety most frequently men-

tioned amongst the numerous comments were the heavy overhead expenses and the fact that too large a list has to be accepted in order to maintain income.

The following quotations have been selected to illustrate the comment:

"A continuing sense of frustration due both to the inadequacy of the capitation fee and to the uncertainty of the amount paid at any quarter (the sum may vary up to £25 for the same number of patients). The increasing cost of living plus anxieties about finding the money for children's education in an underpaid and overworked profession."

"My List is 2000+. I cannot afford a part-time dispenser or secretary. My telephone charge to ring the nearest hospital is 4d.—I would often like to ring the hospital and inquire from the house-surgeon if my diagnosis is confirmed. I cannot truly afford this. I would very much like to attend a monthly clinical meeting or medical dinner. I cannot afford to do this."

5. Size of Doctors' Lists

In view of the frequent complaints that many general practitioners in the N.H.S. have more patients on their lists, often for financial reasons, than they can efficiently care for, the Committee asked a group of practitioners for how many patients, both N.H.S. and private, they were at risk at the present time and how many they thought they could look after efficiently and to their satisfaction. They were asked, in estimating the latter figure, to disregard any consideration of remuneration. The optimum size of list for any particular practitioner will, of course, depend upon many factors, including the doctor's own temperament and skill, the age distribution of patients, the kind of district, and whether midwifery is undertaken.

The number of practitioners who replied to this question was 344, or 71% of the 487 addressed. The information provided is tabulated below. In analysing the present size of lists of practitioners in partnership, the average number per partner has been taken where it is clear that the number given by the practitioner applies to the partnership as a whole.

(i) Number of Patients at Present Time					
(a) N.H.S. and Private			(b) N.H.S. Patients		(c) Private Patients
No.	Total	%	No.	Total	%
Under 1,000	19	5	Under 1,000	76	8
1,000-1,999	67	20	1,000-1,999	66	19
2,000-2,999	115	33	2,000-2,999	115	33
3,000 and over	143	42	3,000 and over	137	40
Total	344	100	Total	344	100

(ii) Optimum Number of Patients					
Town			Country		
No.	Total	%	No.	Total	%
Under 1,000	1	—	Under 1,000	20	18
1,000-1,999	16	7	1,000-1,999	75	67
2,000-2,999	136	59	2,000-2,999	15	13
3,000 and over	77	33	3,000 and over	2	2
Answer indefinite	2	1	Answer indefinite	—	—
Total	232	100	Total	112	100

(iii) Comparison between Optimum and Present Numbers			
	Total	%	
Optimum	115	34	
More than now	139	40	
Less than now	86	25	
About the same as now	4	1	
No comparison available	—	—	
Total	344	100	

One doctor states that the optimum list would vary according to the standard of service expected:

"Under present conditions, about 500 really well; about 2,500 up to expected standard; about 4,000-5,000 if fully staffed and equipped health centres were provided."

A few other notes have been selected for quotation:

"A maximum of 2,500: beyond this number it is necessary to be a 'business man' doctor: the visiting speed of the 4,000-5,000 doctor is fascinating: he meets himself coming out of the house as he is going in. I would like to judge some of them by their reports to R.M.O. on R.M.2."

"Between 4,000 and 5,000. I have never looked after less, and I invite any sceptic to stay with me for a week to see if he thinks my practice is efficiently run."

"I was able to look after about 2,300 patients by diligence before 1948. But now I believe that the number should be almost halved for efficiency. For now work is slavery in a scattered area such as this, where, instead of an annual mileage of 14,000 miles, I must travel 22,000 miles. Work is two to three times as great as before July 5, 1948."

"I should say up to 2,200, which with a practice extending over 80 square miles of country would mean 35-50 miles a day, and from December 1 to end of May some 25-35 visits a day. I reckon 4½ visits an hour, and if I have no meals from breakfast to dinner and visit steadily from 10 a.m. to 6 p.m.—that is, surgery to surgery—34 visits."

6. Method of Remuneration

A group of general practitioners were asked whether the capitation fee system worked fairly for them as a method of payment, excluding from consideration the actual size of the Central Pool. The replies of 345 practitioners were heavily in favour of the capitation fee as a fair method, for the majority of those giving a negative reply and offering alternative suggestions favoured some variation of the method. The figures were as follows:

Replies	Total	%
Yes	224	65
No	118	34
Answer indefinite	3	1
Total replies	345	100

Those replying "No" and adding comments are classified as follows:

	No.	% of Total (345)
Some form of sliding capitation fee	33	10
Other variation of capitation fee	35	10
Item per service	23	7
Salaries service	4	1
Other methods	13	4
Total	108	32

By adding to the affirmative replies the 68 practitioners who, though replying "No," nevertheless think that a capitation fee should be the basis of remuneration, it is seen that about 85% of those replying to the question favour the capitation method.

Although the question excluded consideration of the amount of the capitation fee, 13 doctors replying "Yes" added that the present rate was inadequate, and at least four of those replying "No" showed that it was only the amount of the capitation fee to which they objected.

The sliding scale of capitation fee suggested usually meant a higher rate for the first 1,000 patients or for the small list. Two suggested up to the first 2,000. A few suggested also a reduced rate over a certain size of list. A more complicated scale was proposed by one doctor:

"Payment of £1 10s. per head on first 1,000 patients
" " £1 " " " next 500 "
" " 15s. " " " " 500 "
" " 10s. " " " " 1,000 "
" " 7s. 6d. " " " " 1,000 " and over
Also an additional 5s. per head per annum on people under 16 years and over 65."

The suggestion for a higher rate of capitation fee in respect of children, old people, or the chronic sick appeared in the replies of six doctors. Variations which took into account the factors of seniority or years of service were suggested by four doctors.

Criticism of the mileage scheme was the subject of the comment of seven doctors—five in the rural classes and two in urban areas.

Another doctor thinks that urban practitioners should receive a higher capitation fee than rural practitioners because they work harder, have more surgery hours, and see more of their patients. Nine practitioners wished to have a fixed capitation fee without deductions, and three stated that monthly, instead of quarterly, payments would cause them less inconvenience.

As will be seen from the second table above, 23 doctors in the group would like a fee for each item of service. Four others suggested a fee per service, paid partly by the Government and partly by the patient.

The "other methods" in the second table were usually combinations of methods, such as

- a small basic capitation fee, plus a fee for each item of service;
- a basic salary plus a fee for each item of service;
- a capitation fee plus a small payment by the patient for each attendance or visit;
- a basic salary plus capitation fee;
- an expenses allowance plus a capitation fee;
- an expenses allowance, allowance for length of service, and a capitation fee.

7. Recognition of Skill and Length of Experience

The capitation fee in the N.H.S. is paid at a flat rate for each person on a doctor's list, whatever the doctor's age or the length of his experience in general practice and whether or not he possesses some special skill in a particular branch of medicine. Suggestions are made from time to time that the incomes of general practitioners should be adjusted in some way which will take into account variations in these factors. The Committee endeavoured to ascertain the views of general practitioners on this subject by asking a group whether they thought that some financial recognition should be given to a practitioner in the N.H.S. for (a) special skill and (b) length of experience, and, if so, what method they would suggest for providing it. The answers of 340 practitioners were as follows:

(a) Recognition of Special Skill

Replies	Total	%	Age Groups					
			25-39		40-59		60+	
			Total	%	Total	%	Total	%
In favour ..	183	54	50	50	110	55	23	59
Not in favour ..	125	37	44	44	71	35	10	26
No opinion ..	31	9	6	6	19	10	6	15
Answer indefinite	1	—	—	—	1	—	—	—
	340	100	100	100	201	100	39	100

(b) Recognition of Length of Experience

Replies	Total	%	Age Groups					
			25-39		40-59		60+	
			Total	%	Total	%	Total	%
In favour ..	221	65	54	54	141	70	26	67
Not in favour ..	95	28	36	36	51	26	8	20
No opinion ..	23	7	10	10	8	4	5	13
Answer indefinite	1	—	—	—	1	—	—	—
	340	100	100	100	201	100	39	100

The figures indicate that of the doctors who replied 54% were in favour of the financial recognition of the possession of special skill and 65% of length of experience. Many suggestions were offered for the application of the idea, some detailed, others very general. A number of practitioners who submitted suggestions made a reservation that the additional money required should not come from the Central Pool.

Some of those who gave negative replies to one or both parts of the question did so because they felt that in general practice skill and experience bring their own reward through their recognition by patients. Others thought that any scheme would be too difficult to apply fairly. One replied that "a general practitioner is a specialist and should be paid as such."

The suggestions most frequently made for methods of recognition of special skill were the payment of a fee per item of specialist service rendered, with opportunities to undertake such work and extra payment for special qualifications.

Two of the ideas for special diplomas or examinations for general practitioners may be quoted: "For diplomas in medicine I feel that the universities could usefully institute an M.D. qualification attainable after five years in general practice in which the general practice aspect of all branches of medicine is especially stressed." "This would be a great incentive to do good work. Examinations should be held every three or five years in special branches, such as cardiology and chests; paediatrics; eye, E.N.T., and skins."

A higher capitation fee and a bonus or percentage addition to remuneration were the two methods most frequently suggested for the recognition of length of experience. Several practitioners made the point that in computing years of service experience in the National Health Insurance scheme should be included.

As his suggestion for recognition of length of experience one doctor wrote: "Make 15 years' G.P. experience a *sine qua non* for election to local medical committee—members of which could then be paid a honorarium—subject to satisfactory attendance at meetings. This would get an experienced body of practitioners actually competing for places on L.M.C., which at the moment is often run by an enthusiastic few."

8. Are Doctors Happy?

To one group of general practitioners in the N.H.S. the Committee put the question, "Are you reasonably happy and contented in your work?"

The replies of 345 practitioners indicate that 54% are reasonably happy and contented, though a number had qualifications to make. Four, who are included under "Yes," made a philosophical distinction: they are happy but not contented. The comment on present conditions of practice ranges from "Yes, would not go back to the old days for anything," to "No. If I could get out tomorrow I should."

Seven of those who replied "Yes" wished to make it clear that their answer did not imply that they were satisfied with the present rate of remuneration. Other reservations included the lack of time for study and leisure, overwork, and the excessive demands of patients. Three stated that they were happy in N.H.S. work only because they retained a certain amount of private practice or hospital work.

Some similar reservations were made by doctors who gave negative replies; they could be happy were it not

for the numerous trivial conditions they were called upon to treat. The excessive demands of patients were referred to by most of those who gave a reason for their unhappiness. The general sense of frustration expressed by seven doctors may be illustrated by the following answer: "Since the scheme, despite no real change in number of patients, my work is increased, my pay much less, and I have not the size of practice which I could undertake before in that it is financially not worth while doing minor surgery and giving physiotherapeutic measures and x rays. I feel frustration in my work and deplore the deterioration in relations between the patients and doctor, who no longer come for advice but for authority to gain benefits for which otherwise they would have gone elsewhere but paid directly." Another doctor wrote: "I like being a G.P.—I like my work—but consider conditions have deteriorated since N.H.S. Patients have not the same respect—I work harder and am paid less."

Of those who made a definite comparison with their degree of happiness before July, 1948, six replying "Yes" stated that they were not so happy now as before the introduction of the N.H.S., and four replying "No" stated that they were happy before 1948. One of the latter wrote: "I was very happy in my work prior to the New Health Act. The soul went out of medicine in July, 1948."

9. Effect of N.H.S. on Interest in Practice

Another group of general practitioners were asked whether they experienced any sense of gain or loss of interest in their work now as compared with the years before July, 1948.

Of the 341 practitioners who replied to the question 56% feel some degree of loss of interest in their work since the introduction of the N.H.S. This result may be compared with the replies to the preceding question. The comment suggests that one of the chief reasons is that the proportion of time spent on the treatment of trivial conditions and on routine work is so great that, in the words of one young doctor, "only rarely do I feel I am really practising medicine." Other reasons given are the changed attitude of patients, the loss of interesting cases to the hospitals, the lack of time for reading, and the lack of opportunity to continue special interests. An illustrative general statement was the following: "It has been chiefly loss. One tends to be more mechanical in one's attitude to patients. The undue proportion of trivial complaints, 'mass' consultations, and the feeling of being imposed upon for semi-medical articles have tended to make one a little 'sour.' On the other hand, I have been glad of the opportunities to prescribe much-needed preparations for people who could not previously afford them. In this practice, generally speaking, patients have behaved very fairly and there is still a good spirit prevailing between doctor and patient. I have been determined to preserve it, to prevent complete frustration." One doctor added to his reply: "Loss, yet not 'loss of interest'; it's just a loss—that one can't satisfy oneself, with everything so busy."

Among those who have experienced a gain of interest is a doctor who wrote: "I consider that closer contact with the family as a unit obtains under the N.H.S. and that this creates a warmer and better climate in which to work." Relief from financial considerations and book-keeping was mentioned by two practitioners. Another as found a new interest in his trainee assistant. Through the N.H.S. I am enabled to employ a trainee

assistant, which has given me a new interest in introducing the newly qualified to general practice, and I benefit from his new ideas."

VIII. THE CONTINUOUS EDUCATION OF THE GENERAL PRACTITIONER

1. Local Facilities for Postgraduate Education

The Association's Report on "General Practice and the Training of the General Practitioner" defined the postgraduate education of the established general practitioner as "a continuing process, extending throughout the practitioner's active life, whose object is to preserve and increase his technical competence and to provide a continuing contact with hospital practice and with advances in the diagnosis and treatment of disease." The Committee asked a group of practitioners some questions designed to ascertain whether local facilities for postgraduate education were available to them, whether they took advantage of such facilities as there were, and whether they wished for more facilities, and, if so, of what kind. The information obtained from 320 practitioners is summarized below:

1. Facilities Available Locally

(a) Clinical Meetings and Lectures			(b) Local Courses		
Replies	No.	%	Replies	No.	%
None ..	27	8	None ..	154	48
Occasional ..	185	58	Available ..	155	48
Frequent ..	100	31	No reply to this part ..	11	4
Available (unqualified) ..	6	2			
No reply to this part ..	2	1			
Total ..	320	100	Total ..	320	100

2. Use Made of Local Facilities

Replies	Total	%
Used occasionally ..	155	48
" frequently ..	67	21
" (unqualified) ..	10	3
Not used ..	79	25
No facilities ..	5	2
No reply to this part ..	4	1
Total ..	320	100

Of the 79 practitioners who did not use the facilities available 54 gave as the reason lack of time or pressure of work. Distance was the difficulty for 10 practitioners, and for 15 the times of meeting were inconvenient.

One doctor complained that general practitioners are not notified of opportunities, and another suggested that the Secretaries of B.M.A. Divisions might help by issuing local news sheets of forthcoming meetings and courses.

Eleven doctors did not find what they wanted in local arrangements. Two thought that direct consultations on their own cases were of more value than organized instruction. Four preferred to attend courses away from their own areas. "A fortnight's intensive course at one's old medical school or hospital (with locums provided) is a much more satisfactory way of doing postgraduate work, and is a greater stimulus to learn and put the lessons into practice than any number of half-daily sessions or lectures at local hospitals, many of the staffs of whom are not accustomed to any serious teaching."

Criticism of the standard of teaching came from three practitioners:

"I endeavour to keep up to date. There is not time to take advantage of all opportunities to learn. Many lecturers

hand out material that can be got from standard texts at home. What is needed is *not* spoon-feeding at medical students' standard, but new approaches."

"Apart from meeting other doctors (the chief reason for going to such meetings), I learn as much from the weekly refresher articles in the *British Medical Journal*. The courses I have attended are too like the rounds when a medical student, and frequently out of touch with the problems of general practice."

"We used to have consultants with whom we consulted and by whom we were taught. Now we only have specialists who have no time to consult or teach even if we had time to consult and learn."

To a further question asking whether more local facilities were desired, 62% replied "Yes," and 31% replied "No."

Of those who specified the kind of facility they desired, the majority needed some kind of clinical meeting. Thus 92 wanted clinical meetings, 54 hospital work, and 28 local courses.

Several practitioners emphasized the need for a clinical approach to all subjects of lectures, for the inclusion of the common conditions seen in general practice, and for the demonstration of cases of interest to general practitioners, including "general-practitioner cases" as well as hospital patients. One suggested lecture-demonstrations locally on the lines of the refresher courses in the *British Medical Journal*, and another similar suggestion was that there should be half-day "courses" on specific subjects, with instruction in the most recent developments.

One doctor made the point that clinical meetings should include free informal discussions with the hospital staff; and another replied: "I would like to have more clinical meetings with the local and personal factors emphasized—for example, based on a regional hospital with consultants and G.P.s using that hospital engaged in joint consultation *re* their own cases, rather than the more formal academic discussions which usually prevail."

The variety of times suggested for meetings—afternoons, evenings, week-ends, Sunday morning, summer time—indicates the importance of consultation between those responsible for arranging programmes and the local general practitioners. One doctor suggested that "direct teaching should be given at more than one hospital on more than one evening a month, so that if one is engaged on, say, a Wednesday one can get a tutorial on a Thursday. Meetings should not clash with one's surgery hours."

The most favoured forms of teaching through hospital work were ward rounds (13 replies), clinical assistantships (10), and attendance at out-patient sessions (10). Twenty practitioners desired more association with hospital work and closer liaison with consultants. The desire for continuous education through hospital contacts is illustrated by the reply of a doctor who wants "personal contact with doctors in hospital, socially as well as professionally, with a feeling of freedom to move about the hospital," and by the doctor who wrote: "Doctors should be able to go to out-patient clinics at times suitable to themselves and be given tuition and be able to take part in the session."

A few novel ideas were put forward, including the following:

"I suggest consultants spend an occasional half-day with a doctor, seeing, say, a morning surgery and a morning round."

"I would like to collect all my difficult cases at one surgery, about once a month, and have a physician go over them with me, showing points in detection of physical signs, etc."

"Continuous postgraduate education of the G.P. should be a duty of the regional hospital board. Each physician should have a number of G.P.s allotted to him. The physician would arrange for regular frequent meetings. He would keep his G.P.s in touch with all advances in diagnosis and therapeutics, he would be available to discuss with G.P.s their difficulties and problems. He would arrange for his other colleagues (E.N.T., obstetrics, paediatrics, etc.) to keep G.P.s familiar with their side of the picture."

2. Special Interests of General Practitioners

A group of general practitioners were asked whether they had any special interests within the scope of general practice, and, if so, whether they were able to pursue and develop those interests. The replies of 271 practitioners indicate that 54% take a special interest in some particular branch of medicine within the scope of general practice, but only one-third of these are able to develop their interest.

The branch in which the greatest number of practitioners take a special interest is midwifery, which was given by 51 practitioners, and 8 gave gynaecology. Then came paediatrics (18), anaesthetics (16), minor surgery (13), general medicine (9), psychiatry (8), cardiology (6), tuberculosis and chest diseases (6), and dermatology (5).

The main reasons for the practitioners being unable to develop their special interests are lack of time (33 replies) and lack of access to hospital beds and facilities (36). In midwifery there was also the lack of cases owing to bookings with midwives and attendances at local authority clinics. A doctor who is interested in obstetrics wrote: "I am able to practise only within the range of my own practice. I would favour a scheme in which a general practitioner interested such as I am would receive what one might call local consultant status, and thereby be given the opportunity to help with the more difficult cases of one's colleagues. One's experience and skill would thereby increase. I hold the D.Obst.R.C.O.G., but under the present scheme this is not much advantage to me, as officially one receives no added recognition or status."

Several practitioners complain that they are unable to obtain hospital appointments necessary for the development of their interests, and some who hold special qualifications are unable to make use of their knowledge. For example: "I possess M.R.C.P. and am interested in general medicine. I have no access to x-ray investigations or pathological ancillaries, which I have been trained to interpret. I have time in my work to pursue any interest I may have owing to group practice organization, but no hospital connexion. This would add interest to my work."

3. The General Practitioner's Reading

An important part of the continuous education of the general practitioner consists of his own reading. In order to obtain some information about the extent to which practitioners make a habit of reading medical literature, the Committee asked a group to classify themselves under the most appropriate of three categories; 322 replies are tabulated on the next page.

Some of the practitioners slightly amended the wording to suit their positions. The question of time arose. Ten of those who replied under Category C gave as a reason the lack of time, and six in Category B stated

Replies	Total	%	Age Groups					
			25-39		40-59		60+	
			No.	%	No.	%	No.	%
A. Reads a considerable amount of medical literature	50	16	10	10	31	17	9	26
B. Studies regularly one or two medical journals	211	65	71	72	119	63	21	60
C. Reads little or no medical literature	60	19	18	18	37	20	5	14
Answer indefinite	1	—	—	—	1	—	—	—
Total replies	322	100	99	100	188	100	35	100

that they found it difficult to find time for regular reading. Two others in Category C stated that they had read more before the introduction of the N.H.S. "Before the 1948 Act I managed to read a reasonable amount of medical literature, but now it's a quick look through the *B.M.J.*"

IX. INTERESTS OF GENERAL PRACTITIONERS OTHER THAN CLINICAL MEDICINE

The Committee thought it would be useful to include in its survey a question concerning the general practitioner's non-professional activities and his participation in what are known as medico-political activities which affect the profession as a whole. It asked a group of practitioners in the N.H.S. to compare the part they now take in medical politics, local politics, other communal activities, and hobbies with the part they took in them before July, 1948. Of the 339 practitioners who returned their forms 303 replied to one or more parts of the question, and 36 were not in practice before July, 1948, and therefore could not compare.

THE COMMITTEE'S REPORT

1. THE GENERAL PRACTITIONER IN THE HISTORY OF THE MEDICAL PROFESSION

1. The survey published in the opening pages of the *Journal*, and the postal inquiry preceding this report, present a picture of the general practitioner and his work at a particular period—the year 1951-2. It is appropriate to recall briefly how the general practitioner have developed in being and how he and his function have developed in relation to other branches of medical practice.

2. It is unnecessary for the present purpose to go further back into history than fifteenth- and sixteenth-century England, when the differentiation between the status and functions of surgeons and physicians was first clearly established in the rise of the Company of Barber-Surgeons and the Royal College of Physicians. A third group of practitioners was recognized in 1617, when the apothecaries, originally those members of the Company of Grocers who sold drugs, severed their association with the grocers and obtained a separate charter as the Society of Apothecaries.

3. The apothecary may be regarded as the ancestor of the modern general practitioner and the family doctor. Members of the new society prescribed as well as sold drugs, and, as their practice developed, they made considerable encroachments on the sphere of the physicians. The latter, who were cultured men moving in the highest circles, confined their practice largely to those who could afford to pay fees, and worked in the hospitals, while the apothecaries, less educated and inferior in social standing, practised among the poorer members of the public. The difference between the two groups was one of education, standing, and extent of knowledge and facilities rather

Replies	Medical Politics		Local Politics		Other Communal Activities	
	Total	%	Total	%	Total	%
No change	9	3	3	1	19	7
Smaller part than before	59	19	22	7	101	34
Greater part than before	97	32	14	5	51	17
Has never taken any part	138	46	261	87	124	42
Total replies	303	100	300	100	295	100

The figures above show that over half of the practitioners replying take some part in medical politics and in various communal activities, but only 13% participate in local politics. Since July, 1948, one-third of them have taken a greater part in medical politics, but at the same time a similar number have reduced their communal activities.

Doctors' Hobbies

Gardening is the doctor's most popular hobby according to this survey, for it was given by 115 of the 254 practitioners who responded to the Committee's invitation to state the nature of their hobbies. Next in order came golf (87), reading (44), music (36), tennis (35), motoring (27), photography (27), shooting (24), sailing (23), and fishing (22). Other hobbies which claimed smaller numbers of devotees ranged over a very wide field, from plumbing to philosophy, from mountaineering to small pet dogs.

The replies show that since the introduction of the N.H.S. 70% of the doctors replying have had to reduce the time they can devote to their hobbies. Twenty-seven stated that they had no time for hobbies.

than of essential function. In 1815 the Society of Apothecaries received the legal right to grant licences for the practice of medicine throughout England and Wales, and in 1858 its licence was made registrable equally with university degrees and the diplomas of the Royal Colleges.

4. The Apothecaries Act is important in the history of general practice, for it gave legal recognition to a body of practitioners who had hitherto existed on sufferance. It laid down regulations for apprenticeship and for examination in Latin, pharmaceutical chemistry, materia medica, and the theory and practice of medicine. Surgery and midwifery were not included, but licentiates frequently obtained the membership of the College of Surgeons, and the usual qualification of this class of practitioner became "M.R.C.S., L.S.A." The term "general practitioner" seems to have come into common use soon after 1815.

5. The best type of English general practitioner in the mid-Victorian period was described by Sir Clifford Allbutt in 1920 in his presidential address to the British Medical Association: "His university . . . was nature; in his clinical experience he enriched the instruction, half empirical, half dogmatic, of his medical school by the shrewd, observant, self-reliant, resourceful qualities of the naturalist. His science and his practice were of the naturalist, not of the biologist. In my early days a country drive with such a doctor used to be one of the rewards of the consultant; and a bedside talk with him a lesson in quickness of wit and hand, and of instructive inference and prognosis; his rules of thumb were not without their efficacy, and his flair for the issues of disease marvellous."

6. The general practitioner was steadily gaining ground during the period of the great reforms of the nineteenth century and the period of social revolution. His standard of education, both general and technical, improved. In 1832 a general practitioner, Charles Hastings, founded what was to become the British Medical Association. In 1859 the Royal College of Physicians, which had hitherto concerned itself only with the consulting physician, instituted a new class of licentiates with the right to dispense medicines for their own patients. The general practitioner now also began to take university degrees. Before the end of the century his function in medical practice had become clearly recognized. He was the family doctor, the personal medical adviser of his patient, exercising continuous responsibility and calling in specialist assistance when it became necessary.

7. The result of the various developments and reforms of the nineteenth century was to weld all medical practitioners into a single profession of medicine, but even while that unity was being achieved other forces, some of them outside medicine, were threatening the profession with disintegration of a different form. The increased momentum of these forces is one of the most difficult problems facing the profession to-day. Two main influences may be distinguished. First, the rapid growth of scientific knowledge, which, having extended the potentialities of medicine to undreamed-of horizons, necessitates specialization in particular fields of practice. Secondly, the interest of the State in the health and welfare of the people has led to the public provision of medical services.

8. These factors must be accepted as inevitable in modern society, but their effect on general practice has not been wholly good. The growth of specialism in the profession has tended to transfer to the hospital some parts of the general practitioner's work and to deprive him of these personal contacts with practitioners in other branches of practice which had come to mean so much to him. At the same time, however, it is recognized that the growth of medical knowledge has placed in his hands the means of treating at home conditions which formerly could only be treated in hospital.

9. The interest of the State in medical practice made its first impact on general practice in 1911 with the National Health Insurance Act, which introduced a third party into the relations between doctor and patient. The doctor's "list" and the capitation fee, applied then to the lower-income groups of wage-earners, have now been applied to the whole population, with the result that the environment of medical practice has changed from mainly private practice to mainly State practice. This change in itself is not necessarily a disadvantage, but certain fears for the future of good medicine have been felt. One is that the general practitioner working in a State scheme may be so overloaded with non-essential and administrative duties that his clinical enthusiasm may be curbed and consequently the field in which he exercises it may be contracted. Another is that administrators may tend to regard administration as of more consequence than the service they administer. Administrative convenience may sever the various branches of medical practice and so aggravate the isolation of general practice which specialization in medicine has already begun.

10. State activity in connexion with medical practice has also affected the attitude of the patient towards the doctor. With the increased literacy of the population medicine has naturally lost something of its mystery, but

some doctors feel that they are losing professional status in the eyes of their patients. The patient tends to come not for advice but for a tangible return for his contribution—namely, the "bottle of medicine." It has been said that Mr. Lloyd George introduced the "bottle of medicine habit" in 1911. A love of medicine is perhaps ingrained in human nature, whether it be the charms of primitive medicine, the pills and potions of the early modern period, or the bottle of medicine of the twentieth century, but the danger of the present attitude is that the patient is coming to regard the general practitioner not as his adviser but as a person to give prescriptions and certificates and to refer to a specialist any illness of more than a minor nature. It may be replied, of course, that if this happens the doctor is himself partly to blame because he fails to exercise proper discipline in his practice.

11. Besides the central government, local government authorities, since the Public Health Act of 1875, have concerned themselves with the prevention and treatment of disease. They have certain statutory duties to fulfil—for instance, the notification of disease and the control of infectious diseases—but they have also provided services which general practitioners feel encroach upon their sphere and attract patients away from the surgery to the clinic. It is true that some of these services, such as the school and maternity and child-welfare clinics, were originally instituted by the local authority because general practitioners displayed no desire to undertake the preventive work required, but the important fact is that there has been antagonism and division of responsibility where there should have been co-operation and integration.

12. It is the cumulative repercussion on general practice of all these events and developments which has made the general practitioner of to-day apprehensive of his fate. This uncertainty has been illustrated in numerous aspects of the Committee's survey, and it points to the need for a more precise understanding by the profession itself, by official quarters, and by the public, of the function of the general practitioner, the range of his practice, and the difference between medicine as practised in the home and as practised in hospitals. The terms of service of general practitioners in the National Health Service are, of course, under constant review by the General Medical Services Committee, which, in continuing the work of its predecessor, the Insurance Acts Committee, has already made a very substantial contribution to the improvement of general practice in the National Health Service. The recent establishment of the College of General Practitioners has also been noted with interest.

13. The general practitioner to-day holds a more important place in medicine than ever before, and the nation is receiving from him a more valuable service than ever before. With the modern aids to diagnosis and methods of treatment which the advance of medical knowledge has placed in his hands, sick people are restored to health and activity in a shorter period than formerly, and they can be treated, for a very wide range of conditions, in their own homes without the expense and disturbance of entering hospital. Moreover, the general practitioner is the only person whose view ranges over the whole complex field of modern practice. He selects, on behalf of his patients from his knowledge of the scope and potentialities of all the special branches of medicine, those services and those specialist practitioners most suitable for the individual needs of the patient.

14. Thus the humble apothecary, obscure and unrecognized, has evolved, by the sterling worth of his character and the work and the progress of knowledge, into a highly trained and indispensable practitioner upon whose care for his patient in the home rests the whole edifice of modern medical practice.

II. THE GENERAL PRACTITIONER AS AN INDIVIDUAL

15. The foundation of general practice is the mutual trust and confidence between the individual general practitioner and the individual patient. Each of them makes a contribution to this relationship, the precise nature of which will vary with the characters and temperaments of each. There are, however, certain personal qualities, many of them inborn, which most good general practitioners possess or acquire and which lead a man or woman to choose medicine, and more especially general practice, as a career. Conversely, general practice makes on the practitioner certain demands, both physical and mental, which call for the highest standards of personal character.

16. General practice requires in the practitioner, to a higher degree than many other fields of human activity, a sense of vocation. This call to a medical career may be felt at an early age, or the possession of the special aptitude and personal qualities required for general practice may be discovered only after a period of actual practice. The sense of fitness is most felt by the doctor, perhaps, in the patient's attitude and approach to him—in the confidence and trust with which the patient pours out his troubles to the doctor, and the consolation or courage which is seen to derive from the consultation. The doctor feels his power to cope with his patients' problems and to allay their anxieties, even when these are unexpressed.

17. The Cohen Report contains in paragraph 43 a fairly comprehensive survey of the personal qualities of the ideal general practitioner. It may usefully be recalled here: "An enumeration of the desirable personal qualities of the ideal general practitioner reveals that only a superman could possess them all. He should have an exhaustible tact, wisdom, patience, discretion, and that 'imperturbability' which Osler placed in the forefront of the qualities of a physician or surgeon. He needs to be gentle, yet firm in speech and action, and his manner must inspire confidence and trust. He should have a kindly, humane approach to his patients and, however pressed he may be for time, each patient should be made to feel that his illness is of real concern to the doctor. The general practitioner needs a deeply imaginative sympathy which enables him to understand his patients' fears, anxieties, pain and discomfort. . . . The general practitioner is all things to all men; he is guide, philosopher, and friend to patients of all classes, and shows himself equally at ease with the duke and the dustman, the bishop and the boilermaker. Such 'bedside' qualities must be supplemented by sound medical knowledge and efficient practical work, and the practitioner's art must be applied through scientific methods—observation, discrimination, selection, diagnosis and decision. His general conduct in professional and private life should be guided by high moral principles, and in his practice he should adhere steadfastly to the spirit of the Hippocratic Oath."

18. The Committee would lay stress on the qualities of versatility and adaptability in dealing with a wide variety

of situations, resilience in accepting with equanimity occasional failure and rebuffs, and a physical constitution to withstand the rigours of climate.

19. The general practitioner, in common with other members of the profession, must be trustworthy and possess integrity and a sense of honour and duty. He must be a "gentleman" in that broad sense of the term which, though undefinable, is nevertheless recognized by everyone. Insistence on the sterling and irreproachable character of entrants to general practice is important, for any weakening of the moral tone of the profession may damage the unique relationship between doctor and patient. Perhaps extra vigilance is needed at the present time, when, as is commonly acknowledged, the values placed by society in general upon the practice of religion, upon honour, duty, and moral rectitude are less strict than two or three generations ago.

20. The general practitioner is the patient's chosen personal medical adviser, and this position is the key to his professional function and standing. He is concerned for his patient in sickness and in health, and his interest continues even if it should become necessary for a time for a consultant to assume responsibility for the treatment of a particular condition. When his patient enters hospital the general practitioner does not feel that he is therefore divested of his relationship with the patient. He expects to know what measures are being taken, and perhaps to see his patient in the ward, so that he may subsequently resume his active responsibility with all the requisite knowledge. His position may be compared, in a general way, with the continuous responsibility of a ship's captain, who even when not in direct control on the bridge is still concerned for the safety of the ship and all those on board.

21. As personal medical adviser the general practitioner provides or obtains for his patient the best available diagnosis and treatment. He himself will give a wide range of service according to his skill and the facilities at his disposal. When he needs specialist help he must know where to find the best for his purpose and be able to appraise critically what is available. It follows that he must know the specialists, preferably personally but at least where they are to be found; he must know what each can do, and whether their work is fundamentally good. General practice is based, in this respect, on a series of personal relationships. On the one hand, there is the doctor's patient, with the continuous intimate relationship which is found in no other branch of the profession, and on the other are the specialists from whose ranks the general practitioner selects the help he needs for any particular purpose. It is this unique position which makes general practice a "special" or distinctive branch of practice. The Cohen Report made the same point, but it has been misunderstood by many readers. General practice is not a specialty in the sense that, say, major surgery is a specialty, but it is a distinctive branch with its own special outlook and problems.

22. It has been suggested that the general practitioner is the "all-rounder" of medical practice. He must possess a high degree of resourcefulness and initiative, for he has to be able to turn his hand to any medical task that needs to be done. He has to be competent to cope with influenza epidemics, accidents, aid raids, and any kind of unexpected situation; he must fill the gap when there is no one else to do the job; and he must take over when the specialist physician or surgeon can do no more for the patient.

23. General practice cannot be standardized. Each practitioner, within the commonly accepted traditions, works out his own methods and organization and his own characteristic relations with his patients. He is intensely individualistic, and the interaction of personality and environment needs full play. For his self-realization he must be allowed to choose the type of practice in which he can give of his best, whether single-handed or in partnership, and whether in town or country, and he must be allowed to choose his own partners or assistants. The breadth and variety of the general practitioner's culture and non-clinical interests are well illustrated by the replies to the Committee's question on hobbies.

24. The all-round character of the work of the general practitioner, the personal relationships which it involves, the demand for a sound understanding of human nature, and the necessity for the frequent exercise of common sense, emphasize the breadth of education needed for general practice. The Committee believes there has been a fall in the standard of general education of entrants to the profession due to premature specialization in scientific subjects. This may in time have an unfortunate effect on general practice, for, of all members of the profession, the general practitioner needs the widest possible general education. The foundations of a broad interest in general subjects must be laid before medical training is begun, and the Committee draws attention to the recommendations made in the Association's report on "The Training of a Doctor." It has heard with satisfaction and interest of certain schemes designed to inform medical students of the nature of general practice, including those where general practitioners have been invited to lecture to students in medical schools and where general practitioners have themselves received medical students as guests in their practices for instructional purposes.

III. THE GENERAL PRACTITIONER AND HIS PATIENT: THE DOCTOR-PATIENT RELATIONSHIP

25. The patient, who chooses his doctor of his own free will, has a right to expect from him the best service of which he is capable. At the same time he himself must bring to the relationship intelligent co-operation. There is no standard by which the doctor-patient relationship can be measured, and thus no absolute comparison can be made to show the effect of the introduction of the N.H.S. There is this difference, however. The fee paid by the private patient includes payment not only for the doctor's medical skill but also for the time spent by the doctor in suiting his practice to the patient's convenience. Under the N.H.S. the patient is required to conform to a certain amount of regulation, and, while he may well expect to receive the same standard of medical treatment as the private patient, he is under an obligation not to abuse the Service by making excessive demands on the doctor's time.

26. There is little doubt that there has been at least some deterioration in the doctor-patient relationship. It is surprising that there have not been greater difficulties when the magnitude of the change which took place in 1948 is taken into account, and also the extra work with which doctors have been faced and the fact that some patients appear not to understand that the N.H.S. is a medical service and not a "giving" service. It became apparent in the course of the Committee's discussions

that there has been less interference with the doctor-patient relationship in scattered country practice than in industrial practice. The smaller numbers of patients and the more numerous channels of contact between doctor and patient in such practice as compared with urban, particularly industrial, practice accounts for this difference. In the country personal knowledge of one another is closer and more detailed, and the traditional relations are more persistent. The population is more static and relations do not suffer, as they do in the towns, where loyalties to and preoccupation with mass interests count for more than personal contacts.

27. The Committee feels that the method of payment of practitioners may have a direct effect on the doctor-patient relationship. There seems little doubt that practitioners, on the whole, are happier in their relationships now that fee-charging and the rendering of accounts are almost entirely a thing of the past. Some practitioners, however, are finding difficulties in their relationships with their patients under the present system because there is no payment for individual items of service. Nevertheless, the Committee firmly holds the view that where the doctor is receiving payment for each individual patient by capitation fee, as at present, the relationship is better than it would be in a salaried service. Where the relationship was formerly sound, the institution of a capitation fee has made it sounder. At the same time, the possibility cannot be denied that where the doctor-patient relationship was defective the institution of a capitation fee might well tend to render the link weaker. The Committee believes that the institution of payment by salary would virtually deprive the patient of free choice of doctor.

28. The majority of practitioners find that their relations with the majority of their patients are friendly. By most the general practitioner is regarded as a professional man and friend. On the evidence from the field and postal surveys the Committee is satisfied that there has been exaggeration in the reports that doctors are commonly regarded as servants and officials. There is undoubtedly an increased tendency for the general practitioner to be regarded as a "supplier of medicaments" rather than a medical adviser. Some say a few patients so regard them, and others say many do. As a doctor in the postal inquiry wrote: "At first thought the answer would be 'many,' but the recurrence of the 'few' makes them appear 'many.'"

29. In this quotation seems to lie the general answer to a series of questions. There is a core of patients whose behaviour does not permit the proper functioning of the doctor-patient relationship. Their number may not be large in any one practice, but they are sufficient to cause the doctor irritation and annoyance and to obstruct his work. Taken over the whole country, the minority must be sufficient to give rise to the general impression that the N.H.S. has brought about a deterioration of the doctor-patient relationship.

30. Practitioners were also questioned to see whether any of the excessive demand for services which has been complained of since July, 1948, came from those patients who were formerly the doctor's private patients and are now on his N.H.S. list. Most of them have so transferred. There is a discrepancy here between the results of the field survey and the postal inquiry, though the slight variation of the wording of the question may have had some effect. In the former the number of doctors stating that ex-private patients required a disproportionate increase of services was 26%, while 61% of the

practitioners in the postal inquiry stated that the increased demands from these patients were considerable. In the field survey 16% stated that the increase came from a few patients, and in the postal inquiry 21% stated that the increased demand was slight. The Committee itself was inclined to disagree with statements that have been made to the effect that middle-class ex-private patients have been making excessive demands on the Service.

31. In both the field survey and the postal inquiry there was a heavy majority of practitioners (96% and 82% respectively) who were in favour of the conception of the "family doctor"—one doctor for the whole family. The Committee agrees with this majority, making allowance for the occasional cases where the female members of a family like to have a woman doctor, while a male doctor attends the men. The majority of women doctors customarily attend whole families in the same way as do the men.

32. While it would appear from the figures collected that the doctor-patient relationship is felt, on the whole, to be satisfactory, the Committee thinks it desirable to set down one or two aspects of this relationship which are apt to be overlooked. It is not enough that there should be absence of friction or that the doctor shall have satisfied the demands of his patients. The ideal doctor-patient relationship is dynamic. It needs time for discussion and confidence, and the doctor must be prepared to take infinite trouble to provide for his patient the best available diagnosis and treatment.

33. It is not wrong to expect financial reward for taking trouble, and the financial incentive is an effective means of encouraging good work. The attitude towards financial reward, however, is changing under the N.H.S. Formerly, in private practice, the doctor took an enormous amount of trouble on behalf of his patient, and he did not shirk the difficult or the old or the chronic patient, at whose bedside he would sit to give medical reassurance and consolation. He hoped he would be repaid financially, but he regarded taking this trouble for his patients as part of his practice. To-day in the N.H.S. there is some tendency to secure large lists of the more trouble-free and healthy members of the community, and doctors are left with no time, and perhaps with less inclination, to take trouble for their patients over and above the bare minimum required by their terms of service.

34. There are two ways, complementary to each other, of overcoming any such tendency, which is bad for medicine and bad for the individual doctor, because it weakens the doctor-patient relationship. First, a larger capitation fee and more competition in the form of free choice of doctor may be effective in securing for the practitioner his appropriate financial reward, and in encouraging him to take trouble on behalf of his patient. The investigator in the field survey estimated that, on a high standard, at least one in four of those visited, not content with discharging to the full their obligations under the N.H.S., appeared to be willing to go to great lengths in the interests of their patients.

35. The second way lies in the continuance of a certain amount of private practice. Many patients prefer the more elastic relationship of private practice, and they prefer, for their own reasons, to be independent of regulations which may, in their minds, prevent the relationship with their practitioner from attaining its fullest scope. They wish to be able to approach their practitioner without feeling that they are imposing upon

him in order to discuss their problems with him, even though these do not come apparently within the orbit of what is normally understood to be medical treatment.

Private and State Practice

36. Whether a particular doctor combines private with N.H.S. practice is a matter for individual decision, for it involves temperament and opportunity. A certain discrepancy is observed in the results of the field survey and the postal inquiry, though the wording of the questions differed slightly. The field survey shows that 35% of the practitioners like private patients and feel that there should always be some in the practice, while in the postal inquiry 66% like to include both private and N.H.S. patients in their practice, and a further 15% would like to have private patients only. Those who do not want private patients formed 43% of the field survey and 19% of the postal inquiry. On the lowest of these figures, slightly more than one-third of general practitioners feel that private practice has a definite value.

37. There is room for both N.H.S. and private practice. There will always be some practitioners who can work best outside a public service, as there will always be some who prefer to combine the two. Perhaps most of the 66% who replied to the postal inquiry in the latter sense would echo the practitioner who added: "Because it doesn't make any difference to me whether it is a National Health or a panel patient, or a private patient. I am always ready to attend to any ill person no matter who it is or whether he can pay or not. I think this is our real duty."

38. A further question asked practitioners whether they thought that the fact that private patients were unable to obtain drugs under the N.H.S. had caused many who would have preferred to remain private patients to claim treatment under the Service. In the field survey 50% thought there had been no such effect, and in the postal inquiry those who replied "No effect" and "A few patients only" represented 50% of the group. In considering this figure note should be taken of the reply of a doctor in the postal inquiry: "Many patients say that but for the drug bill they would be private patients, but, if put to the test, I doubt that many of them would return to private status; in my opinion it is just a convenient excuse for registering."

Relations with other Branches of Practice

39. In many parts of this Report attention is called to the effect on general practice of the inadequate liaison between the general practitioner and other branches of practice. The absence of personal contact adversely affects not only the quality of the service the general practitioner can provide for his patient, but it also touches the fundamental doctor-patient relationship itself. The patient notices when consultants or other hospital staff ignore or depreciate his own doctor, and this cannot but diminish his trust in his doctor's competence and his standing in the profession.

40. All medical practitioners, in whatever branch of practice, have the interests of the patient at heart, but some of them fail to realize that they are not serving those interests if they permit any action or omission on their part to threaten the relations between the patient and his general practitioner. This relationship should indeed be one of the strongest unifying influences in medical practice. The Committee is bound to point out that the general practitioner has a responsibility to do his share and should respond to such co-operation as is offered to him.

IV. THE GENERAL PRACTITIONER AND HIS PATIENT: THE RANGE OF SERVICE

41. The Cohen Report discussed in Chapter 3 the nature and scope of general practice, and it analysed, so far as was possible on paper, the functions and responsibilities undertaken by the general practitioner in modern medical practice. The General Practice Review Committee, accepting the description as a fair general statement, has endeavoured in its inquiry to ascertain the attitude of individual doctors to the various functions and responsibilities mentioned, and whether they felt that the introduction of the N.H.S. had had any effect on their ability or opportunity to provide their patients with the range and standard of service they would like to offer.

Continuity of Care and General Responsibility

42. The Committee views with favour any arrangement which permits and encourages the general practitioner to maintain a close contact with his patient during his stay in hospital. This is brought out to most advantage where the general practitioner is on the staff of a local hospital. Whereas an operation or the general direction of the patient's treatment is in the hands of a visiting consultant, the general practitioner is in the hospital each day and is, literally, seeing the patient through the illness. He not only bears but is also enabled to carry into effect the continuous responsibility of steering the patient through the period of trouble, even though he must enlist the aid of a consultant to act as pilot where expert knowledge is essential.

43. The tendency nowadays is to depart from this ideal. There is evidence that, even if the practitioner has time to call to see his patients in hospital, he may not be welcome and may be regarded as something of a nuisance. So often admission to hospital constitutes a break in the contact between the doctor and his patient, only to be restored at some uncertain date in the future, when the patient is discharged. Medicine must be practised as a unity, and this is an example of what happens when it is not.

44. It is just as absurd, or even more absurd, that a patient should be completely isolated from his own family doctor while in hospital as it would be were it decided that a consultant should never visit a patient in his own home.

45. It should be an accepted principle in all hospitals that reasonable opportunities are provided for general practitioners to visit their patients from time to time and to discuss their progress with members of the hospital staff. Such liaison between the general practitioner and the hospital should be regarded as a necessary part of the practitioner's postgraduate education.

46. In a single-handed practice continuous responsibility through a succession of illnesses is obviously exercised by the doctor chosen by the patient, even though an assistant may attend on occasion, but when a single-handed practice is replaced by a partnership a new situation, with both advantages and disadvantages, arises. Partnership arrangements are likely to be such that on some occasions a patient will be seen by a partner other than his own doctor, and the larger the partnership the greater the care necessary to preserve the principles of personal responsibility and continuity of care.

47. Arrangements for a division of work in a multiple practice should be such as will encourage the principle of responsibility for continuity of care. Both the field survey and the postal inquiry indicate that the majority of general practitioners endeavour to secure for their patients the greatest possible degree of continuity of care, though there seems to be no uniformity of method. Conditions in the N.H.S., with heavier and longer surgery hours, have made it desirable in some partnerships to "regionalize" visits—that is, one partner will visit on a particular day all the patients of the partnership living in a particular district, both his own and those of his partners. There can be no objection to these arrangements so long as the principle of

responsibility for continuity of care by the patient's own chosen doctor is preserved. There may, indeed, be some advantages in such a division of visits. It enables all the doctors in the partnership to become known to all the patients, and thus minimizes difficulty when a patient's own doctor is not available—and this must sometimes happen in the conditions of modern life. The interchange also provides an opportunity for the discussion of a case between the partners. This is often of much value to the patient.

48. The Committee recommends that the principle of "one illness, one doctor" should be regarded as the ideal. Such modifications of the ideal as do not conflict with personal responsibility should not be discouraged, but there should be no departure from the rule that a patient joins the list of an individual doctor. He is responsible for giving his patient continuous personal care or, on occasions when he cannot be at hand, for ensuring that the best available care is provided.

Health Education and Preventive Medicine

49. The combination of health education with medical advice is an important part of general practice. The majority of practitioners appear to give advice on hygiene and preventive measures when asked, but many lack the time to do more than this, and patients themselves are often uninterested. The general practitioner, with his intimate knowledge of the home and family circumstances of his patients, is in a strong position to advise on individual measures for the prevention of sickness or improvement of health. Probably much depends upon the skill of the practitioner in making his teaching of personal and individual interest to the particular patient. It is often found that, if the patient is told exactly what preventive measures he should take and why, he is more likely to co-operate than if he is given instruction in the form of general rules of health.

50. The general practitioner's aid can be invaluable in keeping the medical officer of health informed of community sickness trends, particularly, but not exclusively, in connexion with the notifiable infectious diseases and food-poisoning. The general practitioner should recognize that the public health department has an important part to play in health education.

51. There is another aspect of preventive medicine in which the Committee feels that the general practitioner should take an important part. This is in the field of occupational health and industrial medicine. The Committee is of the opinion that managements would achieve maximum results in the field of preventive medicine were they to employ, so far as is practicable, general practitioners, part-time, for advice and work in this field. The Committee notes the current tendency to regard industrial medicine as being unconnected with the curative and preventive medicine practised by the general practitioner. Believing that the general practitioner can be of the greatest assistance in this field, it urges upon those concerned the need to reverse this tendency. Should the general practitioner be excluded from participating in occupational health schemes a valuable opportunity will be lost.

52. General practitioners undertaking this work will realize that, although they are bringing to the task the knowledge and the special approach which they have learned in general practice, their relations with employees cannot be the same as those obtaining with their own patients in their practice.

Treatment of the Patient as an Individual

53. The Committee notes with concern the effect of lack of time in the N.H.S. which prevents a doctor from familiarizing himself with the "totality" of his patient, including his past history and his background. Knowledge of the personality and constitution of one's patient is essential to good medicine. Conditions of practice must be such as will give the practitioner the time he needs for each patient.

54. Part of the explanation of the lack of personal knowledge, however, seems to lie in the attitude of the patients themselves, who frequently misunderstand the functions of

the general practitioner and overemphasize the place of the hospital in medical treatment. Practitioners reported to the Committee that many patients do not expect their doctors to make any thorough examination, but simply to prescribe or refer them to the hospital. Both patient and doctor lose by this attitude.

55. Many patients come not for advice but to get something. They enter the consulting-room with a demand for some ephemeral proprietary preparation on their lips. Urban practitioners are experiencing these difficulties much more than are their country colleagues.

Diagnosis

56. The standard of history-taking and clinical examination is gratifyingly high according to the field survey, and the Committee was informed that among the youngest age group 70% of those visited were placed in the highest class, as against 54% in the middle-age group and 60% in the oldest group. It may be that, while the young man tends to place more emphasis on physical signs, the older man is in a position to rely more often on his clinical instinct, his experience, and his knowledge of his patient. The observer made allowance for this in his assessment, however.

57. Against this good result of objective observation must be set the subjective feeling expressed by a large number of doctors in the postal inquiry that they are unable, through lack of time, to examine patients as thoroughly as they would wish.

Minor Surgery

58. Minor surgery appears to be one of the branches of general practice which have suffered by the conditions of practice in the N.H.S. Both the field survey and the postal inquiry show that there are many doctors who used to do minor surgery and want to do it now, but who are unable to undertake it because the pressure of work in the N.H.S. is too great to allow time for it, because they have lost the hospital facilities which they formerly used for their minor surgery, or because patients think they ought to be sent to hospital for any surgical procedure, however slight. There are, of course, general practitioners who dislike minor surgery or who feel that they do not possess sufficient skill and therefore prefer to send such cases to hospital. There are also others who seem to welcome the excuse of extra work in the N.H.S. for sending all minor surgery to the hospital and thus shedding some of their responsibility. A reason given by some is that no special remuneration is received for minor surgical procedures. The Committee deprecates this attitude. It is of the opinion that general practitioners should undertake for N.H.S. patients those minor operations which, before the Service was introduced, they performed as part of clinical treatment in the ordinary course of general practice.

59. The habitual transfer of minor surgery to the hospital is neither necessary nor desirable. The training of the doctor has included instruction in this work, and, in the view of the Committee, it is a part of general practice. The constant sending of cases to hospital results not only in the loss of practical experience but also in a belief on the part of the hospital staff, especially the junior staff, that general practitioners are not competent to perform minor operations. Moreover, in present hospital practice, especially in towns where there are large hospitals in the immediate neighbourhood, the general practitioner frequently loses contact with his patient because the hospital retains the patient for any aftercare required instead of returning him to his own doctor. Sometimes the reason is simply that some young house officers, eager to see their cases through, forget the general practitioner and their duty to return the patient to him. Whatever the reason, the general practitioner is deprived of his patient and of clinical material.

60. Unless a practitioner really dislikes minor surgery he should be expected and encouraged to undertake it, and he should endeavour to organize his practice in such a way

as to enable him to do so. It is indeed in the interests of his own prestige that he should be prepared to perform this service for his patients. Admittedly it may be difficult in a single-handed practice, but it should be possible to arrange for minor surgery to be undertaken in partnership practices.

61. The Committee is aware of the reasons underlying the efforts of certain organizations to impress upon practitioners the legal risk incurred in undertaking surgical operations of any kind. It considers, however, that it is undesirable for any outside body to attempt to restrict a practitioner in performing for his patient any service he feels competent to undertake. The decision is a personal one, which each practitioner must make for himself in each particular case. He will consider whether the risk is one which he, as a general practitioner, would be expected to accept, and whether, in the interests of the patient, he should perform the operation himself or send the patient to hospital.

62. The remedy for the threatened divorce of minor surgery from general practice lies in the association of the general practitioner with hospitals and consultants. General practitioners should be allowed the use of facilities in local hospitals where they may perform minor surgical procedures and give the necessary immediate aftercare, as was formerly the case in cottage hospitals. Their work should be under supervision of a member of the hospital staff. It seems to the Committee, on the face of it, that the casualty department of a hospital is the ideal place for a general practitioner to do minor surgery. It is realized, however, that there are administrative difficulties. These should not be insuperable, and are worth overcoming in the interests of preserving minor surgery in general practice. Further, much of the present uncertainty about which minor operations ought to be sent to hospital for specialist attention and which the general practitioner can quite well perform himself could be removed by local discussion and agreement between hospital staffs and general practitioners.

Certification

63. Administrative duties, on the whole, seem to cause little difficulty to most practitioners, though certification sometimes presents a problem. The Committee believes that some practitioners do not regard certification with due seriousness, while others find more difficulties than they need. If these doctors would study the current regulations they would find them not so irksome after all. Only a minimum of certification should be necessary, and the practitioner should bear in mind that his primary duty is his clinical work.

64. Not all the blame, however, should be laid on the doctor. He is, to some extent, at the mercy of outside influences. The public generally has little regard for professional ethics and cannot, or will not, understand the doctor's hesitation. Patients are quick to take advantage of any weakening on his part. Further, the practitioner is subjected to pressure by the Ministry of National Insurance, which, regardless of practicability, demands certificates on a particular day of the week. Many practitioners do not seem to realize what the regulations are. The second certificate of incapacity for work must be given within seven days of the first. Thereafter the weekly certificate may be given on any day between Sunday and Sunday of each week. If there is hardship caused by uneven payments of sickness benefit the problem for solution is administrative, not medical. The Committee is of the opinion that more account should be taken of the difficult position in which the pressure of events has placed the general practitioner. Doctors could help themselves if all those in an area could meet together from time to time in order to determine and agree upon a "common certification front."

Non-medical Advice

65. Little comment need be made on the last of the functions of the general practitioner listed in the Cohen Report. The great majority of general practitioners are prepared to

give, when asked, advice which, though not strictly of a medical character, yet has a bearing on the general well-being of the patient and may be regarded as incidental to general practice.

Special Interests

66. Both the field survey and the postal inquiry show that about one-half of the doctors concerned take a special interest in a particular branch of general practice. Sometimes, indeed, the interest tends to become a specialty. In the N.H.S., however, about one-third of these practitioners are unable to develop their interests, mainly through lack of time or lack of access to hospital beds and facilities.

67. The Committee is of the opinion that general practitioners should be encouraged to develop special interests within the scope of general practice. This is most easily arranged in a group practice, and it is one of the arguments used in favour of health centres. It also raises again the need for the association of general practitioners with hospital work. One way of providing facilities would be by clinical assistantships which would interfere as little as possible with the management of the practice.

68. It should be emphasized that the development of the special interest should not necessarily be a step towards transferring to a specialty, but it should add variety to general practice and enable the practitioner to provide a fuller service for his patients. In some areas the local doctors find it an advantage to have among their number one who has made a special study of a particular aspect of practice and who can help with difficult cases.

Midwifery

69. The Committee has devoted much time to the consideration of the place of midwifery in general practice and the repercussion on general practice of outside events in the field of obstetrics. It is firmly of the opinion that midwifery is an integral part of general practice and that every possible encouragement should be given to general practitioners to undertake it. The coming of a new baby is an important event in the family, and the family doctor should be closely concerned with it. Many long-established doctors have found midwifery to be the most satisfying part of their experience. They believe that, generally speaking, a general practitioner who does good midwifery makes a better all-round doctor than one who does none. During recent years there has been a tendency to divorce midwifery from general practice. Much of this is due simply to the fact that the interest and competence of the family doctor have been ignored by those responsible for obstetric services.

70. There has been a gradual diminution in the amount of domiciliary midwifery carried out by general practitioners. The Committee considered it important to discuss the reasons for this diminution and to suggest methods of encouraging domiciliary midwifery.

71. One reason for the diminution was that, even before the war, expectant mothers were becoming more "institutionally minded." In the post-war period this outlook, coupled with housing difficulties and with the fact that institutional confinements are a good deal cheaper for the patients than home confinements, made institutional confinements more popular. Then there is the tendency among mothers to hold the hospital in higher esteem than the general practitioner, and to feel that in the hospital everything will be at hand in the event of an emergency.

72. The general practitioner thus loses contact with his patient at an important moment of her life, and responsibility passes for the time to a consultant. Present arrangements for institutional midwifery, it has been said, tend to place normal cases in an environment suited to abnormal cases. An event which should be a natural physiological process supervised by the family doctor takes on the aspect of a major illness requiring the care of a special department. Responsibility is divided and continuity of care is

broken, for, while antenatal care has been given by the general practitioner or clinic medical officer, a member of the hospital staff is responsible at the confinement.

73. It is apparent to the Committee that a high proportion of general practitioners like midwifery and wish to do as much as possible. A few comments are quoted in the report of the postal inquiry to illustrate how some practitioners feel that midwifery is, as one puts it, "the keystone of a successful general practice." There has been a great deal of argument in recent years for and against general-practitioner domiciliary midwifery, but the Committee feels that, in the light of opinions expressed to it, it must put forward a further plea on behalf of the general practitioner.

74. It seems likely that steps will be taken to adjust monetary considerations as between institutional and domiciliary confinements. It is also likely, however, that the housing problem will be with us for a considerable number of years. The Committee is of the opinion that if, owing to unsuitable home conditions, the confinement must take place in an institution and the woman would like to be attended by her own doctor, there should be a number of beds available for this purpose.

75. These beds, forming maternity units for cases which clinically could be domiciliary cases, need not be in general hospitals and need not carry the full established staff of a specialist maternity unit. The midwife who would have attended in the home would attend the case in such a unit. Consultant advice should be readily available if required by the general practitioner. The Committee believes that, by this provision, the expectant mother would receive adequate care during her confinement. Such provision may have the additional advantage of reducing the present high cost of institutional confinements.

76. Such domiciliary midwifery as remains tends to be undertaken by midwives, the general practitioner being called in only in an emergency. The result is that the general practitioner, excluded from institutional obstetrics and restricted in domiciliary obstetrics to emergencies, is placed at a disadvantage, for his loss of contact with normal midwifery reduces his ability to deal with the abnormal. This explains the reluctance of many general practitioners, both young and old, to undertake midwifery. The Committee believes that many practitioners are content to leave domiciliary confinement to the midwives, but part of the responsibility for this situation must be attributed to the attitude of some midwives who attempt to exceed their proper function and are unwilling to co-operate with general practitioners. This is not in the interests of the patients, and deeper thought should be given to the relations between doctors and midwives.

77. Particularly since the coming into force of the National Health Service Act, the more general booking of general practitioners by expectant women has tended to alter this. This has caused grave concern to midwives, who feel that their status is being attacked and that they will in future become "maternity nurses" rather than midwives, thus tending to create a feeling of resentment and competition rather than co-operation between midwives and general practitioners.

78. The Committee wishes to place on record its high appreciation of the splendid work midwives have done in the past, and would like to assure them that general practitioners are just as keen as midwives to encourage an efficient and satisfactory domiciliary midwifery service. It feels, however, that it is important for the good of both professions and for the patients that any gulf between general practitioners and midwives, imaginary or real, should be bridged.

79. The Committee believes that, if general practitioners and midwives could work together as a team, each with his or her own function and responsibility, much of the present difficulty in domiciliary midwifery would disappear. The trouble is that, with the depleted number of domiciliary confinements, some midwives are reluctant to take on the

attendance at the confinement. There need be no such antagonism if the relative functions are understood and observed. The midwife is highly trained in a restricted field. The doctor is trained in the wider field of medicine, surgery, and obstetrics, and, as the family doctor, he is intimately concerned with all that happens to his patient. To him the pregnancy and the confinement are events in the life of his patient with environmental, psychological, and medical implications.

80. This indicates the character of the team-work, and it also suggests a line of procedure. At an early date in the pregnancy the patient, her family doctor, and the midwife should meet together in the doctor's surgery and decide whether the doctor should attend at the confinement in any event or only if the midwife finds his attendance necessary. In a normal case the decision must depend largely on the wishes of the patient. Some women like to have their doctor present; others are satisfied if they feel assured that he will come if he is needed. At this early meeting the doctor will also make arrangements for antenatal care. He should examine his patient as often as he considers necessary. According to generally accepted standards he will see her at least once every month until the 36th week and thereafter more frequently. The more care he gives during the antenatal period the fewer will be his abnormal confinements. The midwife, of course, will also make her routine visits. The doctor may or may not attend at the actual confinement, but if the delivery is left to the midwife he should attend within a stated period to satisfy himself regarding the patient's condition. Finally, he will make at least one post-natal examination.

81. If young practitioners were made to realize that midwifery comprises all this care, it is likely that they would feel more encouraged to undertake it. Midwives also, when they appreciate this view of midwifery, are more likely to be willing to co-operate with the doctor.

82. It should be appreciated by the general practitioner, the midwife, and the public that where doctor and midwife are working together as a team this in no way relegates the midwife to an inferior status; she is a midwife and is working as such. The Committee feels strongly that this situation is not fully appreciated by either doctors or midwives and that it has an important bearing on the present confused ideas about the correct professional relationship between doctor and midwife.

83. The Committee feels that clarification of the situation is necessary, and that responsible professional and administrative bodies at all levels should take steps to clear up the misapprehensions which exist. For example, the use of the term "maternity nurse" should be discontinued when a midwife is working with a doctor.

84. A further point in the problem of general-practitioner midwifery is the tendency, among administrators, consultants, midwives, and others, to underestimate the competence of general practitioners to undertake midwifery. This is seen in their exclusion from institutional midwifery and, in England and Wales, in the requirement of approved postgraduate experience for admission to local obstetric lists. The Committee will not enter into the long-drawn-out argument of whether admission to undertake midwifery implies the same degree of competence to undertake midwifery as to treat patients for any other condition, but it takes its stand with those who would allow any registered medical practitioner to provide a midwifery service for his patients if he wished and who would encourage him to increase his experience. In saying this it emphasizes two points. The first is the view already expressed that midwifery consists of much more than the conduct of a confinement. The second is that present planning is for the future, and in the future newly qualified practitioners who are interested in obstetrics will have an opportunity of improving their knowledge and experience during the post-qualification year of resident appointments. It is to be hoped also that there will in the future be an increasing measure of co-operation and mutual understanding among

the different branches of the profession. It is against this background that the Committee recommends that any general practitioner who wishes to undertake midwifery should not be precluded from doing so by administrative restrictions. The present obstetric lists maintained on a basis of varying criteria by local obstetric committees in England and Wales should be replaced by the Scottish procedure—that is, that every registered medical practitioner should be eligible to have his name included, if he so desires, in a list of practitioners undertaking to provide midwifery services, and should receive the full fee.

85. Finally, the relations between the general practitioner and the public health service in connexion with midwifery are at present somewhat confused and unsatisfactory. The Committee has been informed of attempts to persuade women to attend local authority clinics rather than their doctors for antenatal examinations. If the midwifery service develops on the lines suggested in the foregoing paragraphs there will be no need for antenatal examinations to be made by any doctor other than the one who is to be called in in the event of emergency at the confinement, thus preserving continuity of care.

86. The Committee is aware of the history of local authority clinics and the reasons for their existence, but it believes that the time has now come for some reorientation of the local authority maternity services in conformity with the general practitioner's outlook. Possibly antenatal clinics might be staffed by general practitioners provided that, normally, the antenatal examinations would be undertaken by the doctor who was to be responsible for the confinement. In any case, the question whether the patient will attend at the clinic or the doctor's surgery during the antenatal period is best decided in consultation between the patient and the practitioner. The clinics will still exercise an educational function, for many matters in the field of mothercraft may be better taught by midwives or others in such clinics than by the doctor in his surgery. It is important, however, that co-operation with the general practitioner should be maintained.

87. That there are difficulties is hardly surprising, for, as has been said elsewhere, to have three separate administrative bodies dealing at once with one event in a patient's life is to invite confusion, trouble, and, consequently, misunderstanding and bewilderment on the part of those actually attending the patient.

The Care of Tuberculosis

88. In some areas, as a result of the lack of institutional accommodation, the domiciliary care of patients suffering from tuberculosis falls increasingly heavily on the general practitioner. About half of the general practitioners in both the field survey and the postal inquiry are satisfied with the arrangements for the domiciliary care of tuberculosis. The main complaint of the remainder was the insufficient visiting by the chest physician and health visitor.

89. The domiciliary care of tuberculosis has been affected by the transfer of responsibility for treatment from the local health authority to the regional hospital board. The former tuberculosis officer, whose outlook was mainly preventive and one of whose duties was the visiting of patients in their homes, has been replaced by the chest physician, whose outlook is mainly clinical and who is more interested in institutional treatment. Moreover, the tuberculosis officer was concerned wholly with the care of tuberculosis, while the chest physician's interest lies in all diseases of the chest, of which tuberculosis is only one. The chest physician, who usually sees the patient at a clinic, knows little of the home environment, and domiciliary care is left to the general practitioner, who has little or no personal contact with the chest physician.

90. There should be more co-ordination between provision for the diagnosis and the treatment of tuberculosis and between out-patient and domiciliary treatment. This implies more co-operation between the public health officer,

the chest physician, and the general practitioner. In both diagnosis and treatment the chest physician should be available to the general practitioner for consultation in the same way as other consultants, and when a patient is discharged from hospital the general practitioner should be notified. The district nurse should work under the direction of the general practitioner, with whom she should keep in constant contact.

91. The Committee believes that co-ordination on these lines, together with a fuller service of home help, would place the domiciliary care of tuberculosis on a better basis than exists at the present time, but there is also urgent need of more beds in hospitals and sanatoria. All the domiciliary care that can be given by general practitioners cannot take the place of institutional treatment for those who need it, or prevent the spread of infection to other members of the household when isolation or removal from unsuitable housing conditions is necessary. Apart from the long waits for beds in sanatoria, there is difficulty in securing the admission to hospital of cases of acute tuberculosis. The Committee recommends that provision should be made in each area—for example, the area of each hospital management committee—where practicable, for a certain number of beds reserved for acute tuberculosis.

Care of the Chronic Sick

92. One of the social problems of the day which have an important repercussion on general practice is the need for the provision of care and treatment for the elderly and infirm. The Association published a report on this subject in 1947, mainly in connexion with the planning of hospital services. It quoted one of the members of the Committee who prepared the Report: "What is needed more than anything material is an awakening of the whole community to the existence in their midst of a state of affairs often tragic in its melancholy and suffering." No one is more aware of this suffering and also of the hopelessly inadequate means of relieving it than the general practitioner and the district nurse. They see the heart-breaking plight of the aged sick living without domestic help in unsuitable accommodation and the reluctance or inability of younger members of some families to look after them. Although very often the general practitioner can do little more than ease pain and bring consolation, the burden of frequent visits imposes a serious strain on his practice, and there is no one to whom he can turn for help.

93. More institutional care on the lines of the Association's earlier report is certainly required, and there should be some means of ensuring that those most in need are admitted. An old person who is acutely ill should be treated in a general hospital in the same way as a younger person, the same principles for urgent admission being applied. Old age or infirmity should not, of themselves, prejudice admission to hospital.

94. In many areas there are long lists of old or chronically ill people waiting for admission to institutions. As a means of reducing these lists some doctors suggest the re-establishment of the relieving officer, but the Committee is not in favour of this. It does suggest, however, that an appropriate medical officer should visit and examine every patient proposed for the waiting-list for institutional care, and assess the degree of priority or urgency in consultation with the general practitioner.

95. The Committee believes that the most pressing need in this field is for Eventide Homes rather than for hospitals for the aged and infirm. The very care which the old people receive in Eventide Homes prevents them from reaching the stage where hospital admission is essential. Thus the demand for hospital accommodation can be kept within bounds. A number of these Eventide Homes have been opened in various parts of the country and are performing a great service. Those in the homes are under the care of a general practitioner, who can at least feel that what he is called upon to do for his patients is the more worthwhile on account of their more satisfactory environment.

96. The ideal in many cases is that the old person should be kept going under satisfactory conditions in his or her own home. In order to effect this there is a great need for an expansion of the home-help service. The service of a home help should be interpreted broadly, to include more than the usual domestic work. The good home help will bring a degree of companionship to the aged person or chronic invalid, help him to move about the house as much as possible, and stimulate his interest in various ways. Such service may require a certain amount of training, and efforts should be made to enlist the help of more women of the right type.

97. Another advantage of a more adequate home-help service is that it would enable the earlier return home of many elderly hospital patients who at present tend to occupy beds, badly needed for other purposes, simply because they have no one to look after them on discharge. A complete home-help service would include night attendance. The mere presence of a companion during the night is a great comfort to the old person. Perhaps appropriate voluntary organizations could incorporate the provision of such "night-sitters" in their activities.

Advances in Medical Knowledge

98. The range and methods of general practice are necessarily influenced by the general advance of medical knowledge and by progress or change in other fields of medical practice. Both the field survey and the postal inquiry show that the majority of general practitioners are conscious that they now have in their hands more effective means than their predecessors of diagnosing and treating illness, and that they can cure in the home conditions which could formerly be dealt with only in the hospital.

99. The advances in medical science bring to the general practitioner responsibility as well as power, for they increase the need for vigilance and acumen in making an early diagnosis. They should also raise the relative importance and prestige of general practice in the profession. It is important that this broadening field of the general practitioner should be recognized both by practitioners in other branches of medicine and by the public. Patients might become less "hospital-minded" if they were more aware of the capacity of their own doctors to treat, successfully and quickly, most of the common illnesses.

Changes in the Profession

100. The advance of medical knowledge must necessarily bring with it some changes in the organization of the medical profession. The most noticeable result of the widening horizon of medicine and the greater depth of knowledge is the increasing fragmentation of medicine into specialties. The Committee inquired whether this had any adverse effect on general practice. Many general practitioners are not conscious of any handicap from this cause, but the replies of those who are indicate that some attention should be given to this repercussion.

101. The two particular adverse effects which seem to cause most trouble are the breaking up of hospital accommodation into specialist sections and the difficulty of obtaining general consultant opinions. This latter results in the transfer of the patient from one consultant to another, and a tendency for all of them to overlook the general practitioner's interest in his patient. Increasing specialization in so wide a field as medicine now covers must be accepted, but it emphasizes the necessity for closer liaison between the general practitioner and the hospital.

102. There is, further, the danger that the most able young practitioners may be attracted to specialization at the expense of general practice if the range and interest of the latter are sacrificed. General practice must be allowed to retain its appeal for those young doctors who enter upon their career with the idea of working and living among the people. The view that general practice is a branch of medicine with its own special outlook and special problems should receive wider recognition.

Effect of the Operation of the National Health Service

103. In both the field survey and the postal inquiry about a quarter of the general practitioners concerned felt that the operation of the N.H.S. had had no effect on the scope of their practice. In the field survey 45% considered that their scope had been increased, because they could now do more for their patients without taking finance into account. In the postal inquiry the emphasis of the replies was on the increased attendances, which allowed the doctor less time to undertake services which he formerly gave his patients, thereby diminishing his scope.

104. The changes in hospital organization and the public health service brought about by the introduction of the N.H.S. have had their effect on general practice. This effect is felt rather in the matter of relationships and contacts than in the range of service given by the doctor to his patient, and is therefore reserved for discussion in later sections of the report.

Public Education in Health

105. A feature of modern life which affects the service of the general practitioner is the new knowledge, or perhaps half-knowledge, on medical matters acquired by the public. The effect of the instruction given through the radio, television, the Press, various organizations, and other means may depend upon the personality of the individual patient, and may be good or bad, but it is certain that it has introduced a new complication into general practice in recent years. Often this consists in counteracting the effects of the instructions given by others. Illustrations of how the doctor has to cope with his patients' "little learning" are given in the reports of the field survey and the postal inquiry.

106. There is some divergence of opinion on whether public instruction, even of the highest standard, in the working of the human body and the causation of disease is good or bad for the public health and patients' peace of mind.

V. THE GENERAL PRACTITIONER AND HIS PRACTICE

107. The Cohen Report contains the following sentences in para. 53: "At least part of the secret lies in efficient organization, and this will depend to a considerable extent on the practitioner's having a sense and understanding of business method, the keenness of his interest in his work, and his ability to delegate non-medical duties to competent ancillary staff. Efficient organization enables work to be done with greater ease, more speed, and less distraction from the truly medical work of practice."

108. The investigator in the field survey estimated that in 66% of the practices he visited the organization was "adequate," that in 84% the administration was "adequate," that 49% of the consulting-rooms were adequate for the maintenance of a reasonably high clinical standard, and that 91% of the practitioners had a full range of essential equipment. In record-keeping 53% see the cards of most patients in the surgery, while a further 21% take them out on their rounds as well. The introduction of the N.H.S. does not seem to have caused any radical change in methods of organization.

Non-medical Help

109. The employment of clerical help in the practice relieves the practitioner of much of the burden of administrative detail, and gives him greater freedom for clinical work. In both surveys a number of practitioners reported that they were handicapped in the conduct of their practices by the lack of such help. The Committee believes that, in addition, many doctors who say they do not want clerical help would appreciate its value when once they had it. It recommends that practitioners should be aided and encouraged to employ non-medical help. It is not always necessary to engage for this work a trained shorthand-typist; an intelligent general clerk or receptionist can give valuable help at less cost. The Committee believes in some areas

men or women of a suitable type could be found who would be willing to work at hours to suit the practice, though in others the irregular hours and split working day may cause difficulty.

Nursing Help

110. A small proportion of practitioners have a trained nurse helping them in their work. A substantial number stated that a trained nurse would prove of great value to them in the conduct of their practice. The advantage would be that they could delegate to the nurse the many time-consuming procedures such as dressings and injections, thus allowing more time for the study and diagnosis of the patients' complaints.

111. There are doctors who have no desire for any such assistance, preferring to do themselves for their patients everything that is required. The obstacle of expense is plain to all, but the Committee considers that a trained nurse can be of tremendous advantage to a practitioner. At present the cost must restrict the employment of trained nursing help almost entirely to the larger partnerships.

112. Some have solved the problem satisfactorily by employing a trained nurse for clerical and clinical duties.

The Doctor's Wife

113. A general practice pervades the general practitioner's whole household, and the part played by his wife is of the highest importance to the smooth conduct of the practice. The employment of non-medical help would relieve her to some extent of her unceasing responsibility to the practice, faced as she is with a diminution or a disappearance of domestic help. Among the married doctors 84% in the field survey and 97% in the postal inquiry were helped to at least a moderate extent by their wives. The proportion, however, of those wives who took a considerable part in the administration of the practice was much higher in the postal inquiry (39%) than in the field survey (19%). The difference in figures is accounted for by the more precise classification possible in the field survey.

114. In some places it has proved possible to ease the burden, at least partially, and thus to overcome the problems created by the virtual disappearance of domestic help. Where manual exchanges exist temporary transference of telephone calls to the house of a partner or colleague during off-duty times is a fairly simple matter. In the increasing number of areas served by automatic telephone exchanges the problem is more difficult. It is understood that notice is required in order that the machinery may be adjusted for the purpose. Doctors have adopted the device of installing an extension to their own telephone in the house of their partner, and vice versa, so that if one partner is off duty his calls are automatically received in the house of the other. Some members of the Committee reported on the usefulness of including an alternative number in the telephone directory.

Appointments System

115. Few practitioners in the N.H.S. adopt an appointments system for all consultations—the field survey and the postal inquiry showing 2% each. Appointments are arranged, however, by 65% in the field survey and 76% in the postal inquiry for special examinations and private patients.

116. The former includes, for example, examinations for life assurance and instances where the practitioner feels that he would rather devote a special time to a case calling for detailed or exhaustive examination than undertake it in the rush of a busy surgery. There can be no objection to a system of appointments for private patients only, provided that it does not interfere with the arrangements for N.H.S. patients.

117. The Committee is aware that, over and above these special appointments, many practitioners make appointments less precise as to time, either to meet the clinical needs of the case or to suit the convenience of the patients. For

example, they will ask patients to come at a certain surgery when they expect to be less busy, or they will arrange to see patients attending for routine injections in the half-hour before their surgery officially begins.

Health Centres

118. A Committee of the Association has already reported its views on the general subject of health centres. The present review has given an opportunity of ascertaining the opinions of individual general practitioners on whether the health centre is desired as a basis of general practice. The result was as follows:

	Field Survey		Postal Inquiry	
	No.	%	No.	%
In favour	90	48	139	38
Not in favour	88	47	192	53
No definite opinion ..	10	5	31	9
Total	188	100	362	100

The views for and against the establishment of health centres are varied. One of the main arguments in favour of them is that they would give the doctor and his family more privacy in the home and ease the domestic burden. One of the main arguments against them is that they would disturb the doctor-patient relationship.

119. The Committee would draw the attention of those concerned with the development of general-practice organization to the fact that many who favour the setting up of health centres of the kind on which most argument is at present based do so for the personal reasons mentioned above. The survey has not revealed any considerable body of feeling that health centres are essential to the improvement of the standard of general practice. The Committee believes that further experiment is desirable, including the development of health centres, in stages, from communal surgeries. It is preferable for the development to come from within the profession rather than from some health-centre organization superimposed from outside. There are signs that general practitioners are discovering the advantages of mutual association among neighbours, and they may find through this experience the ideal character of co-operative practice. It is of the utmost importance that general practitioners should be consulted on the subject and not be regarded as so much technical labour.

120. At this juncture it is useful to quote the following paragraph from the Report of the Nuffield Provincial Hospitals Trust for 1948-51. The Committee has no desire to condemn or disparage health centres merely because of a lack of enthusiasm at present prevalent, which, as indicated in the following, cannot be based on experience:

"This declining enthusiasm may be due in part to the differing opinions on what health centres should be, and in part to the general practitioners' individual preference for courteous competition; but not a little of the atmosphere or disillusion may be due to the absence of working examples by which the benefits and defects of different forms of health centre can be judged. The financial limitations which have prevented [...] health centres [...] from being put into operation are to be regretted, not because they have prevented the wide realization of an ideal, but because the general ban has to some extent hindered local experimentation with a few prototypes of different kinds of health centre."

121. Many matters affecting ownership and finance would arise in the consideration of any scheme of health centres. Although some doctors would wish them to be owned, financed, and administered by the profession, many others would expect relief from their present heavy overhead expenses and the provision of non-medical staff at no cost to themselves. Health centres of the latter type are likely, in the Committee's view, to open the door to lay administration and so create new problems for the profession.

Although the doctor may expect to receive assistance in obtaining the necessary services, it must be expected that a substantial proportion of the cost would be borne by the N.H.S. or the doctors themselves.

122. While it is undesirable that local authorities should seek to initiate health centres conceived primarily from the point of view of administration, they should be prepared to support and encourage any co-operative schemes proposed by the local doctors. It would be an advantage to the discussion of the subject if more general practitioners were members of health committees of local authorities.

The Committee's Views on Organization

123. It is not possible to lay down any ideal organization for a general practice, for so much depends upon individual temperament. Some practitioners prefer to work alone, others prefer a partnership. Among the practitioners included in this review between 40% and 45% are in single-handed practice and between 55% and 60% are in partnership. There are disadvantages at each extreme. The rural single-handed doctor may be so completely isolated from his colleagues and from hospitals that he is denied the benefit of new knowledge and methods, while in a large partnership the work may be so subdivided that the individuality of the doctor-patient relationship is obscured.

124. One of the advantages of a partnership practice is the opportunity it gives to each partner to develop some special interest, whether by obtaining hospital appointments or by undertaking all the work of the practice in a particular field. Alternatively, many practitioners prefer to maintain their separate practices but to associate themselves with others in order to enable them to develop a special interest in a similar way. The Committee recommends the encouragement of such group practice. The continuous contact of the group provides a valuable stimulus to all its members, and also permits the easy working of a rota arrangement.

125. In visualizing the general practice of the future, the Committee would include, as essential elements wherever practicable, personal contacts with consultants and public health medical officers, and ready access to diagnostic aids.

VI. THE GENERAL PRACTITIONER AND HIS COLLEAGUES

126. The Cohen Report emphasized the importance to general practice of full co-operation between all branches of medicine. The general practitioner must maintain a series of personal relations which enable him to obtain, when necessary, the best possible advice and treatment for his patient. The Committee accordingly devoted part of its inquiry to this subject.

127. The results of the field survey and the postal inquiry agree fairly well in showing that, on the whole, there is an absence of discord among the general practitioners of a district, though active cordiality is not always evident. The introduction of the N.H.S. has not had any very noticeable effect. Where professional relations were good before, they remain so, but there is a certain amount of mutual suspicion.

Off-duty Arrangements

128. Most practitioners make some arrangement with their partners or assistants or with neighbouring doctors to enable them to have occasional week-ends free of duty, or freedom from night calls or emergencies, and to provide a substitute for periods of illness or holiday. The Committee endorses the remarks of the investigator on the value of such co-operative arrangements where they are practicable. As he puts it, many a rota "has turned the sourness of professional rivalry into the sweetness of co-operation." The number of doctors participating in any one rota should not be too large, or the scheme will become unwieldy and impersonal. A small friendly group, where each practitioner is well known to all the others, is to be preferred. Some doctors

like an unwritten mutual understanding better than a fixed rota. Whatever the detail of the method, the Committee recommends the formation of local rota schemes as a method of providing relief for individual practitioners and of increasing the efficiency of practice. It tends to heighten the ethical tone and neighbourliness of local practice. It enables a practitioner to leave his practice for a short time without fearing that he may lose patients to a rival or that his patients will be neglected. The Committee observes, however, that there can be too much emphasis on "time-off" in general practice. A rota system should be small in extent, lest it warrant the description "organized absenteeism."

Opportunities in the National Health Service

129. One of the dangers of an official medical service is that administrative considerations may stifle freedom and opportunity for the practitioners who provide the medical care.

130. There are widespread reports and complaints about the difficulties confronting the young man in his entry into practice. Not so loudly heard are the voices of those practitioners in middle life who wish to change their practices.

Changing of Practices

131. To consider the latter first, the abolition of the buying and selling of practices in the N.H.S. has affected the freedom of all practitioners. It is not the desire of the Committee to enter into the pros and cons of the sale of practices. The Committee feels, however, that in a survey of general practice it must point out how the freedom of general practitioners has been affected.

132. A certain proportion of practitioners settle in practices as young men and remain by their own desire in the same practices until they retire. Probably the majority do not stay in the same practices but make at least one change in the course of their professional career. Changes in family circumstances, increasing years, and a natural wish of children as they attain adulthood, and a natural wish for a change to more salubrious surroundings, albeit with less financial reward, are some of the common reasons for a change.

133. In the past a general practitioner could sell his practice and search, with his money in his pocket, for what he wanted. It was by no means always easy, but so far as opportunities presented he was the master of his choice. Now a further factor has been introduced which may, at any rate in some cases, make a suitable change more difficult to effect. He now has to apply for what is virtually a public appointment, in the competition for which he has been found to be at a disadvantage, possibly for the very reason for which he is seeking a change, that he is over 45 years of age. He cannot sell and he cannot buy, and his future must be decided by others. Many practitioners feel, as one of them put it, that they are in bondage. There are men who have worked hard in their earlier years in unattractive industrial areas and have covered their children's education and now wish to change to less well remunerated and more pleasantly situated practices. There are also men in small country practices who, in order to provide for growing families and/or larger income to provide for growing families, feel compelled to change to large urban practices. Investigations should be encouraged in the means by which such men may be put into touch with one another. There are facilities, through the Medical Practices Advisory Bureau, for the exchange of practices. In theory such exchanges should be easy to arrange, but experience shows that, in spite of the number of applicants, they are surprisingly difficult.

Assistantships and Partnerships

134. To turn to the young man entering practice, the Committee believes that any measure which leads towards the permanent establishment of practitioners in practice is to the good. Every encouragement should be given to men

and women to practise in the area and type of practice to which they are suited, and in which they can practise good medicine. Some young men like to try two or three types of practice before settling down, but the general rule should be that a man is received into a practice with a view to remaining there. There are, of course, a very small number of doctors who do not wish to become principals at any time and prefer to remain permanent assistants.

135. The Committee believes that assistantship for a reasonable period remains the best introduction to the work of general practice, following the usual resident hospital posts.

136. Assistantship with a view to partnership is the commonest mode of entry to general practice, and probably the best. The ideal period would seem to be from six months to two years. Despite all that has been said over the years it still seems necessary to say that no young doctor should take an assistantship without taking proper advice and seeking the elementary safeguards for his future. So much has been heard of the "view" that turned into a mirage that the Committee reminds all those entering practice of the necessity for safeguards and of the services available through the Association and the Medical Practices Advisory Bureau. The *Medical Practitioners' Handbook* and the model forms of agreement prepared by the Bureau should be carefully studied.

137. Abuses by principals of assistantships occur from time to time. "Farming out" a practice with multiple assistants has died out since 1948. Only occasionally is a practice heard of in which the assistant is required to do the bulk of the work. Assistantship with view may come to an end owing to an incompatibility between the doctors concerned which becomes apparent. On the other hand, it may have been a bait to a series of assistants to attract them to the practice for a limited time, only to change when the question of implementing the promise of partnership is raised by the assistant.

138. Some more senior practitioners are understood to be reluctant to take their assistants into partnership, partly because the remuneration of their practice will not allow of it and partly because such action on their part would have an immediate adverse effect upon their superannuation prospects. Fears on these grounds are understood to be ill founded in many instances, because superannuation is based upon net income—that is, after the deduction of the assistant's salary. The Committee believes, however, that in some circumstances reduction of pension may ensue as a result of taking an assistant into partnership.

139. Applications for practices are reported to be exceedingly uneven; often there are fifty or more applicants for a practice, or a doctor may apply for many practices before he is even short-listed. Nevertheless it is known that a few vacancies in certain areas of the country have received no applications at all, and many receive only a small number. Undoubtedly, there would be more offers of partnership to assistants if a portion of practice compensation could be realized by the principal at the time of taking an assistant into partnership. Whereas the Committee believes in the value of assistantships, it firmly supports any measures which will encourage principals to have partners rather than assistants, the post of assistant being preferably regarded as a temporary measure in any one practice.

Postgraduate Study

140. Opportunity for a high standard of clinical work implies freedom to develop special clinical interests and time for postgraduate study in various forms. Postgraduate study, especially when arranged locally, is also of value in helping the general practitioner to maintain contact with his general-practitioner colleagues and with practitioners in other branches of medicine. There is a discrepancy between the answers in the field survey and the postal inquiry to the question whether practitioners desire more facilities for postgraduate study. In the former only 27% desired more facilities

ties, while the corresponding figure in the postal inquiry was 62%. Probably the objective field survey gives a truer answer. Nevertheless, the Committee believes that, with more time and less pressure of work, practitioners would feel more interested in keeping themselves up to date and participating in local postgraduate activities, and it recommends that the various suggestions made in the Cohen Report should be put into operation wherever possible.

141. It will be remembered that the Cohen Report recommended that the responsibility for all the arrangements in an area should rest with a Postgraduate Committee and the Dean. The needs of the general practitioner in the matter of postgraduate courses were considered to include: (i) the refreshment of basic knowledge and procedures, including the clinical methods; (ii) information on new methods of diagnosis and treatment; (iii) the relation of new knowledge to his own approach to medicine and to his patient; (iv) a periodical restatement of the contribution of other sciences to medicine. The report recommended that programmes of local postgraduate education, which should be arranged in consultation with local general practitioners and for times to suit their convenience, should include: (i) lectures, with or without clinical demonstrations, time being allowed at the end for questions; (ii) various types of courses at local teaching and non-teaching hospitals; (iii) discussion groups and conferences; (iv) clinico-pathological and clinico-therapeutic conferences; (v) medical films; (vi) "brains trusts"; (vii) meetings with members of other professions.

142. Wherever possible, combined clinical meetings between general practitioners and consultants should be held at local hospitals, and the academic interest should be given a social background. This might well be arranged by the hospital's providing for light refreshments to be served: it would appear to be a proper way of using "free moneys" in the provision of educational facilities and staff amenities. It has been shown that this type of meeting is usually better attended than the ordinary lecture or demonstration, and goes further to establish cordial relations between the general practitioner and the hospital staffs.

Trainee Practitioners

143. The trainee practitioner scheme has now been in existence for four years, and it would be inappropriate if a survey of general practice failed to make some comment upon it.

144. To deny the soundness of the theory of an apprentice system for general practice would be difficult. But has the system in practice fulfilled theoretical expectations? Does the trainee practitioner subsequently become a better practitioner than he would have done had he entered practice by the traditional route? The answer to these questions is important for the good of general practice, and for the good of the public purse.

145. The success or otherwise of any education system is difficult to appraise. Examinations are an imperfect yardstick, but the best that can be applied. They are inapplicable to the trainee scheme. Nor can we appeal to comparison as a measure for guidance, since the trainee system is too young. Also the practice of medicine itself changes too much. We must therefore rely for our judgment upon our own experience of the scheme and the impressions we have gained.

146. Clearly the potential benefit to be gained by a willing pupil from the individual instruction of a tutor who has the requisite knowledge and the ability to impart it to others is enormous. No doubt this ideal situation has obtained in many of the doctor-trainee relationships. Equally clearly it cannot have done so in others.

147. Although certain guiding instructions have been laid down which aim at weeding out from the list of trainers these general practitioners who are too busy to teach or whose practices are too small to provide the necessary teaching material, a perfect method of selecting teachers is difficult to devise. The present scheme is fundamentally good,

though there have been criticisms of the way in which trainers have been selected, and also of the way in which trainers have carried out their obligations. It is, however, too early to reach any definite conclusion on its efficiency. Any alternative mode of selection by a central committee would not be an improvement, because lack of local knowledge would obviously be an impediment. Perhaps the best answer to the problem is that intending trainees will naturally select those teachers who have built up a good reputation.

148. It is inevitable from the nature of the financial arrangements of the trainee practitioner scheme that there should be a tendency to regard the trainee as a cheap form of help rather than as one who should be helped. No doubt most principals are conscious of their obligations, but because of lack of time some are unable to carry them out to their satisfaction. They find that they cannot do their own job and teach a trainee at the same time. Others feel that the best way for an assistant to learn general practice is by finding out for himself, and they treat the trainee as they would an ordinary assistant. Many will agree with this opinion, but nevertheless it is not in accord with the intention of the scheme or the purpose of its financial subsidy.

149. It is probable that future generations of general practitioners will benefit from some preliminary training in the practical aspects of their future work. It is open to question whether the present scheme is the best or the most economical means of attaining the object in view.

150. At least one big teaching hospital runs its own "general practice" in which students are working under general practitioners. It would seem well worth while to explore the idea of associating senior medical students with general practitioners, more especially in the neighbourhood of teaching hospitals. This may indicate a means of teaching the ways of general practice to all medical undergraduates, whatever their future work may be, and of bringing a whiff of general practice into the rather rarefied atmosphere of the teaching hospital.

VII. THE GENERAL PRACTITIONER AND THE PUBLIC HEALTH SERVICE

151. The same proportion (79%) of practitioners visited and those replying to the postal inquiry expressed the view that the introduction of the N.H.S. had had no effect on their professional relationships with public health medical officers. Some weakening of the personal contact has occurred through the transfer of certain functions from non-county boroughs to county councils, and by the use of bed bureaux for the admission to hospital of cases of infectious disease, while in London a similar weakening has occurred through the transfer of functions from the Metropolitan Borough Councils to the London County Council. The replacement of the tuberculosis officer by the chest physician and the result of the transfer of responsibility for the treatment of tuberculosis to the regional boards has already been mentioned.

152. In spite of these transfers there is still much of mutual interest to general practitioners and public health medical officers. There is no need for the atmosphere of competition between the two branches to persist. When difficulties arise they are sometimes found to be due to the separate approach to patients by members of the public health staff without communicating with the general practitioner concerned, with the result that conflicting advice is given.

153. The remedy seems to the Committee to be to some extent with the initiative of medical officers of health, who are appreciating more fully this need for personal contact. The M.O.H. should make himself known and accessible to the general practitioners of his area, ascertain their views and their problems in relation to his own service, and ensure that his staff co-operate, in their various spheres, with the patient's family doctor. The Committee heard with pleasure

of a newly appointed M.O.H. who made it one of his first duties to make himself known by telephone to each general practitioner in his area and to offer his help whenever it might be needed. Against this must be set the statements made to the Committee by several general practitioners that they scarcely knew, or never met, their M.O.H.

154. Another suggestion that the Committee would like to make is that the M.O.H. should arrange some system of liaison between the different groups of workers who are each contributing in their own fields to the welfare of the patient—general practitioners, midwives, district nurses, and health visitors. Only good can come from personal contact and knowledge of each other's work.

155. At the same time the Committee wishes to call the attention of general practitioners to the need for reciprocal action in this matter. They are urged to make themselves acquainted with the services and co-operation offered by the public health medical officers, and to respond to their initiative.

156. The Committee has also found that in areas where the M.O.H. is a member of the local medical committee the relationship between him and the general practitioner is improved. This means of contact, if generally adopted, might well resolve many difficulties.

School Medical Officers

157. The complaint of a doctor in the postal inquiry that he had received in five years only two notes from school medical officers about children in his care serves to draw attention to the following policy agreed between the Association and the Society of Medical Officers of Health:

(i) Where, in the opinion of a medical officer employed by a local authority, a child needs special investigation (other than an ophthalmic examination) or treatment, he should send the child to a specialist only after prior consultation with the child's own doctor, upon whom rests the responsibility for general medical care.

(ii) In consulting the general practitioner, the medical officer should give him the opportunity to make the arrangements for a reply consultation or to agree—by replying or in the absence of a reply—that the arrangements should be made by the medical officer.

(iii) A copy of any special report on the child received by the medical officer should be sent to the child's own doctor.

158. The Committee particularly stresses the need for close liaison between school medical officers and general practitioners regarding the treatment (among other things) of all children whose tonsils appear to be enlarged. In its opinion the decision whether a child should be sent to a consultant should rest with the general practitioner. He knows the family history and can relate the child's condition to the environment, and he can best decide whether tonsils, which may be large, are injurious to the child's health. It is important that the school medical officer should refer children to their own doctors and not to the hospital or a specialist.

District Nurses

159. There is less criticism of district nurses than of midwives. Indeed, many practitioners are full of praise for them. They are indispensable to efficient general practice, and can relieve the doctor of many routine duties, such as the changing of dressings or the giving of certain injections. A minority of doctors feel that they are losing place to new. The local district nurse as old methods give place to new. Formerly she worked for a particular district, where she was known to the doctors and patients and was a familiar figure going her rounds on her bicycle. Now she is less visible in her motor-car. She works with limited hours. Despite the obvious and often necessary advantage to the nurse, these new conditions may result in some loss of the personal touch. For example, one patient may be visited by several district nurses in the course of an illness. The doctor is thereby placed at a disadvantage, for there is often no particular district nurse to whom he can give instructions.

160. Wherever this loss of contact has occurred the local doctors should make a positive effort to counteract it. They are in a position to make strong proposals, for, although the district nurse is employed by the local health authority, she works under the clinical direction of the individual doctor whose patient she is attending. A suggestion which appealed to the Committee and seems well worth consideration by the appropriate authorities is that each general practitioner in an area should have a particular district nurse attached to his practice. Both the doctor and the district nurse would gain by the personal contact and common interest in the patient, and the patient would be happier with a district nurse whom he could identify with his doctor's practice. The Committee is, of course, aware that under present circumstances the number of areas in which such an arrangement would be introduced is limited.

161. It was reported to the Committee that some doctors are inclined to leave a great deal to the district nurse without proper supervision, and thus to take up so much of her time that the patients of other doctors are deprived of her services. Doctors should be considerate in this matter. While the giving of certain injections may safely be delegated to a district nurse, the general practitioner must himself supervise her work and visit the patient frequently.

Health Visitors

162. Although the number of practitioners in the field survey and the postal inquiry who made complaints about the activities of health visitors were in a minority, the character of their criticism suggests that in some areas there is serious cause for a review of the functions and activities of this group of public health officers. Hitherto health visitors have been mainly concerned with maternity and child welfare, but now they are rather general social workers visiting the home for a variety of purposes. Some reorientation of training and attitude is required to meet the new type of duty, and in the present transitional stage a number of health visitors, failing to appreciate the change, are causing difficulty between patients and doctors. The Committee agrees with the view that the future training of health visitors should consist of a basic training in nursing, and a general training in social work specially related to the total environment of the patient.

163. Such a training should produce a suitable type of health visitor. The Committee would emphasize the particular need of training her to work in co-operation with the patient's doctor. At present health visitors usually visit the patient's home without the doctor's knowledge and give independent and sometimes different advice. Patients are bewildered and doctors irritated.

164. It is most important that the health visitor should always get into touch with the patient's own doctor so that she may work in close co-operation with him in every case. The administrative arrangements should be such as to give effect to and recognize this relationship. It is understood, of course, that she would also report to the M.O.H. This would tend to increase and improve liaison. The Committee has heard of Joint Committees of the General Practitioners, Midwives, and Health Visitors, which have resulted in improved relations and a better service for the patients.

Liaison with General Practice

165. The Committee has little doubt that medical officers and others working in the public health service are on the whole perfectly ready to work in close liaison with the general practitioner in the interest of the patient. It seems tolerably certain that many general practitioners have hardly considered the possibilities, or, alternatively, look upon the public health service with suspicion.

166. The Committee believes that until there is at least a closer and more general administrative liaison between these two branches of the Service some difficulties and misunderstandings will persist.

VIII. THE GENERAL PRACTITIONER AND CONSULTANTS

167. The personal relationship between general practitioners and consultants is closely bound up with the impact on general practice of the reorganization of the hospital services under the N.H.S. The personal contact remains of the utmost importance, yet there is evidence that it has become weakened during the last few years. The Committee has tried to find out the nature and the cause of the threatened cleavage, and to suggest how it might be averted. In order to avoid a one-sided view it invited a number of consultants in different branches to answer certain questions, and it is most grateful for their willing co-operation.

168. The results of the various questions put to the general practitioners in the field survey and the postal inquiry show that, to the majority, their degree of personal contact with consultants is satisfactory. Out of 32 consultants who were approached 23 (72%) felt that no alteration had occurred in their relations with general practitioners since July, 1948. Yet the Committee does not feel that all is well in this respect. It believes that some general practitioners tend, without much reflection, to accept isolation from hospitals and an impersonal relationship with consultants as an unavoidable result of the N.H.S. This is not in the interests of good medical practice, and the Committee attaches importance to the minority expressions of opinion to the effect that certain features of the consultant services tend to weaken the relationship between the general practitioner and the consultant. If the patient and the general practitioner are to obtain the full value of the consultation there must be personal contact or communication.

169. A complaint which was made in connexion with this and several other aspects of the Committee's inquiry was that a patient referred by a general practitioner to a particular consultant was often seen only by a registrar or junior. The Committee understands that registrars and junior consultants must be given opportunities of acquiring experience, and that the overcrowded out-patient departments require their assistance. Nevertheless, if a general practitioner takes the trouble to select his consultant and to address a letter to him personally, he is justified in expecting that his letter will be seen by that consultant personally, who will take full responsibility for the patient. There is here an insidious alteration of relationship which should not be allowed to develop. Hitherto the consultant was responsible to the general practitioner who sought his opinion, and, indeed, he depended upon the good will of the general practitioner for his livelihood. Now the consultant is becoming a remote impersonal hospital officer who delegates some of his work to registrars. He thus tends to become a consultant, not to the general practitioner sending the case, but to a registrar needing help. This appearance of an intermediate relationship is not in the interests of the patient or of general practice.

170. In drawing attention to practices of this kind the Committee is looking ahead to the attitude of future generations of consultants. The young consultant with only hospital experience of medical practice who absorbs this view of the consultant's function will be unaware of the proper relations between the consultant and the general practitioner and, indeed, of the purpose of the general practitioner's reference.

171. The Committee heard with interest of the success of informal teatime meetings arranged at one or two hospitals in the country where general practitioners are welcomed to demonstrations and discussions of cases. The Committee believes that the widespread development of such meetings will bring decided advantages to patients, consultants, and general practitioners. The Committee looks to all consultants to show more interest in professional gatherings, clinical and otherwise. The opportunities that arise at these meetings for getting to know one another and hearing one another's views are of undoubted importance.

172. There is also much that the general practitioner himself can do to help the development of good neighbourliness between consultant and general practitioner. The Committee knows that social contacts are common in some areas, and believes that the more general they become the better co-operation will there be between these two branches of the profession.

Information to Consultants

173. The Committee understands from its inquiries that most consultants, when a case is referred to them, prefer a letter of medium length summarizing the case history.

174. Of 983 patients referred to 34 consultants, 69% took with them letters from the general practitioners which were considered by the consultants to be satisfactory; 26% took letters of little or no value; and 5% took none at all.

175. The Committee recommends that, where appropriate, hospital authorities should consider the introduction of suitable forms acceptable to both the general practitioner and the consultant for the use of general practitioners who desire them when referring patients to hospital.

176. Whether or not a form is used, hospital procedure should ensure that a letter or form addressed to a consultant is seen only by the consultant, and is not available for scrutiny by the patient or by lay staff other than the confidential clerk concerned. A satisfactory arrangement is mentioned in the report of the field survey—namely, a letter-card addressed to the hospital appointments clerk which contains on the outside all the information required by the clerk, and a sealed inner letter to be opened by the consultant to whom it is addressed.

Domiciliary Consultations

177. The great majority of general practitioners attend to meet the consultant at domiciliary consultations; in fact, the number shows a slight increase since the introduction of the N.H.S. There are, however, some general practitioners who do not feel that it is necessary to be present, and a number of consultants who do not hesitate to see a patient without the general practitioner. The Committee was informed that some consultants arrange domiciliary visits at times to suit themselves, regardless of the convenience of the general practitioner.

178. The Annual Representative Meeting and the Joint Subcommittee of the Central Consultants and the General Medical Services Committees have expressed the view that a domiciliary consultation should be a consultation with both the general practitioner and the consultant present, and that only in exceptional circumstances should a consultant conduct such a consultation in the absence of the general practitioner. The value of the personal consultation cannot be too strongly emphasized. It is, indeed, the essence of the domiciliary consultation, and in the Committee's view no consultation in the proper sense takes place if the general practitioner is not present.

Causes of Diminishing Contact

179. The Committee questioned practitioners on possible specific causes of any diminishing contact or understanding between general practitioners and consultants. There is a distinct feeling (41% in the field survey, and 55% in the postal inquiry) that the tendency of prospective consultants to begin specialist training immediately after qualification frequently places an obstacle to their appreciation of the general practitioner's work and problems. Unless this understanding is present, it is difficult for the consultant to know exactly the kind of help the general practitioner needs when he refers a patient for an opinion.

180. While it is not within the competence of the Committee to make recommendations concerning the training of the consultant, it will not be exceeding its function if it puts forward for the consideration of those concerned some

observations on the repercussion of specialist training on general practice. The general practitioner when referring a patient is justified in expecting that the consultant will appreciate his needs and advise measures that are practical. Unless the consultant has had some actual experience of general practice he is likely to lack a realization of the background and environment of the patients he sees. Several general practitioners in the inquiry stated that the consultants who had had some experience of general practice gave more valuable advice than those who had not, and even that the two groups could be distinguished by their general approach to patients. Further, the consultant who has received his entire training in hospital tends to develop the technical aspects of his work at the expense of the personal touch. This has led to the appearance of what some doctors called the "technician type" of consultant, who is not the type to attract the confidence of the general practitioner. A short period of experience in general practice could do much to counteract this tendency. Although it may involve some modification of the accepted scheme of training of consultants in the N.H.S., the Committee puts forward for consideration the view that such basic clinical grounding, over and above the experience gained prior to registration, is particularly important in view of the high degree of specialization now existing in medicine. Unless those practising a special branch have been so grounded, there is a grave danger that the work and development of that specialty will become warped. After all, the *raison d'être* of the consultant is to advise the general practitioner needing specialist help, and, unless he can in imagination place himself in the general practitioner's position and appreciate the patient's outlook and background, he cannot advise to the most valuable degree.

Administrative Separation

181. Practitioners on the whole do not seem to be conscious of any adverse effect on their practices of the administrative separation of the consultant section of the profession under the regional hospital boards and the general-practitioner section under the local executive councils. They are perhaps not sufficiently interested in administration to give the matter much thought. To the Committee, however, this separation, together with the separation of the public health medical service, is one of the greatest defects of the N.H.S., and one of the most important causes of the lack of contact between the three main branches of the profession. Possibly the divergence of interests had begun before July, 1948, but it has certainly been intensified since that date by a rigid administrative scheme which makes no provision for collaboration between practitioners giving different, though complementary, service in the same profession. The effects permeate general practice, as is shown in various parts of this report, and, while the Committee is not directly concerned with administration, it would recommend that the feasibility of co-ordinating the administration of the N.H.S. should be studied by the authorities concerned as a matter of urgency.

IX. THE GENERAL PRACTITIONER AND THE HOSPITAL: HOSPITAL FACILITIES

182. It was put to the Committee that, just as every patient has his own doctor, so every general practitioner should have his own hospital. Although the two parts of the proposition are perhaps not strictly comparable, there is much to be said for it. It is already the policy of the Representative Body of the Association that the general practitioner should constantly and closely associated with the hospital, and both the field survey and the postal inquiry attempted to ascertain whether this association existed in practice. The result found is that there is insufficient liaison, and there is less now than before July, 1948. At present occupied in adjusting themselves to increased demands, many general practi-

tioners do not appear to feel any serious adverse effect on their practices of the absence of hospital facilities. Some complain that they still do not enjoy direct access to pathological and radiological departments.

183. Interpreting the idea that "every general practitioner should have his own hospital," the administrative arrangements would include direct access to the special departments, the allocation to general practitioners of beds where they could treat their own patients for "general-practitioner conditions," and the appointment of general practitioners to part-time appointments or clinical assistantships. All these facilities will give the practitioner added interest and more incentive to good work, and they will also bring with them the more intangible effect of mingling with consultants on their own ground and of becoming known in the hospital. It is often because he is so little known that the general practitioner receives such scant respect from the hospital staff. A further advantage is that association with a hospital will raise the status of the general practitioner in the eyes of the public. In order to achieve a positive association of the general practitioner with the hospital it will be necessary for hospitals to take steps to encourage contacts.

General-practitioner Beds

184. In the opinion of the Committee general-practitioner beds are a desirable part of the doctor's equipment on both clinical and social grounds. There is often no need for a patient who requires treatment in an institutional bed to enter an ordinary hospital ward under the care of a consultant. Such cases are to-day augmented by social conditions, and many patients who could be treated at home must enter hospital simply because home nursing and attention are not available.

185. Both the field survey and the postal inquiry showed that the great majority of general practitioners (89% in the former and 72% in the latter) have no access to beds. Although some are conscious of the effect of this on their practices, many feel no adverse effect. The Committee feels that general practitioners should be taught to appreciate the value to them of hospital beds where they may treat their own patients for "general-practitioner" conditions.

186. The Committee believes that great benefit will accrue to general practice if hospital authorities provide, whenever possible, a small number of beds specifically allocated to general practitioners for their own cases. These need not necessarily be in a separate hospital, though the modern type of cottage hospital would serve the purpose well. In modern conditions it may be found more convenient to allocate a ward in a general hospital for this purpose rather than to create new units with, possibly, a lower standard of nursing and accommodation. Such an arrangement would be on the understanding that, if a general-practitioner bed were unoccupied, it could be utilized by a consultant rather than allowed to remain empty until the general practitioner next happens to need it.

187. In the view of the Committee it is of particular importance to town practitioners that they should be allowed close association with and access to hospitals. It is doubtful whether industrial practice can ever be run on lines similar to the family practice in the country. The country practitioner, by virtue of distance alone, is bound to perform a wider variety of services for his

patients. In the town it is more convenient, and sometimes even more proper, for the practitioner to pass the patient on to the nearby hospital for such services.

Clinical Assistantships

188. The Committee agrees with the suggestion that there should be general-practitioner clinical assistantships in hospitals. The Cohen Report, in recommending these, emphasizes more particularly that the appointments should not be used to dilute the staff of the hospital, nor should general practitioners be employed primarily to share in the burden of the routine work. They are there, the report says, essentially for educational purposes. The present Committee was interested to note, from the field survey, that 81% of general practitioners were in favour of some type of clinical assistantship. It is a useful means of associating the practitioners with the hospital, and to this the Committee attaches much importance.

189. The Committee favours the suggestions made in the Association's Report on the Association of the General Practitioner with Hospital Work, that there should be three types of clinical assistantship available to general practitioners. The first is the honorary clinical assistant, for practitioners to be attached to a department or departments for their own education. The second type, the established clinical assistant, would be for a longer period and would enable the practitioner to have responsibility in the department, to gain very considerable experience, and to qualify to sit for a diploma. The third type, the senior clinical assistant, would be a post for general practitioners with adequate experience in a specialty.

190. The Committee endorses the warning in the Cohen Report that clinical assistantships must not be used to encourage the appearance of an inferior grade of specialist.

Access to Special Departments

191. The Committee's inquiries show that over half of the general practitioners have access to pathological facilities and about half to radiological facilities, and that the absence of such access causes difficulty to about half of those without it. In the postal inquiry, however, many practitioners, when replying to other questions, mentioned the difficulty and delay caused by having to send cases through a consultant. Other evidence before the Committee suggests that the question of allowing access to these departments to all general practitioners should be considered as a matter of urgency by the authorities concerned.

192. In order that it should see both sides of the subject, the Committee invited a few consulting pathologists and radiologists attached to hospitals or laboratories where direct access was allowed to comment on their experience of the use of their departments by general practitioners. Most of them are satisfied with the arrangements and can cope with work sent by general practitioners. The degree to which practitioners use the departments depends much upon whether the facilities offered are made known to them and upon the standard of interest and knowledge of the practitioner.

193. For example, a consulting pathologist told the Committee: "We have two Dr. F.s using this laboratory; the contrast in what they ask us to do has constantly made us wonder what the difference is in their practices. Dr. F. 1 finds the most exciting cases, uses

the laboratory wisely and constantly, appreciates every figure and result sent to him, and has repeatedly praised the service. Dr. F. 2 sends occasional specimens without any definite indication of what he wants done, seldom appears to recognize the disease he is dealing with even when he has sent the case to us for investigation, has to have even normal figures interpreted to him, and rejects every suggestion we make as to treatment—for example, in pernicious anaemia."

194. A radiologist who states that nearly all the local general practitioners use his department to varying degrees writes: "The privilege does lead to some appreciation of the department. One town general practitioner frequently calls to discuss a case before making any request, and invariably appears later to see the films. This practice is more prevalent among the better-quality general practitioners, and for them is worthy of encouragement."

195. The Committee believes that advantages to both sides would result from the opening of pathological and radiological departments to general practitioners. It would encourage closer relations between the consultant and the practitioner, and it would relieve the strain on out-patient departments. The Committee puts forward the following series of recommendations:

- (i) It is desirable that general practitioners should have direct access to pathological and radiological facilities.
- (ii) It is desirable that general practitioners should have direct access to pathological departments at least for the taking of blood counts and simple chemical investigations, in addition to the bacteriological and serological facilities provided by the public health laboratories.
- (iii) The use of the facilities should be regarded as a consultation between the general practitioner and the pathologist or radiologist.
- (iv) The general practitioner should be encouraged to discuss the results of the investigation with the pathologist or radiologist when such a discussion seems desirable.

Physiotherapy Services

196. The ancillary treatment which general practitioners find it most difficult to obtain for their patients is physiotherapy. This is caused partly by the lack of sufficient physiotherapists and partly by the necessity, in the N.H.S., for sending every patient to a consultant before treatment can be ordered. The patient has to wait a long time for an appointment, the domiciliary service is inadequate, and the long journey that may have to be undertaken to attend the physiotherapy centre sometimes undoes the benefit obtained by the treatment.

197. The Committee was also informed that some consultants who prescribe the treatment may have no experience of general practice or knowledge of the home conditions of patients, that they may prescribe in unsuitable cases, and that they may allow the treatment to be continued longer than is necessary or desirable. In the view of the Committee the advice of a competent general practitioner would help to ensure that the facilities for physiotherapy were used to the best advantage and in those cases where it is likely to prove most beneficial. The number of consultants in physical medicine is likely to remain small for some time to come, and the Committee considers that a physiotherapy department which has no consultant in physical medicine might well be placed under the direction of a suitably trained general practitioner, acting in the capacity of a member of the hospital staff.

X. THE GENERAL PRACTITIONER AND THE HOSPITAL: RELATIONS WITH HOSPITALS

198. The Committee has already considered the general practitioner's personal relations with consultants in hospital and his opportunities, or absence of opportunities, for taking part in hospital work. It now turns to the effect on general practice of the inadequacy of hospital provision and of certain aspects of hospital procedure. About half the practitioners in the field survey and nearly two-thirds in the postal inquiry state that their practice is obstructed in various ways. Replies to other more specific inquiries show that the greatest difficulties arise from the insufficiency of beds, long waits for consultations, and delays in sending notifications and reports to the general practitioner.

199. There is little complaint of actual encroachment on general practice by hospitals. Indeed, as the investigator in the field survey found, many general practitioners are only too glad to let the hospitals relieve them of some of their burden. Patients are rarely accepted in the out-patient department without a letter from the general practitioner, but one-third of practitioners complain that patients sent for consultations are retained for treatment unnecessarily. There was, however, a substantial amount of dissatisfaction that, after the initial treatment or after discharge from the wards, patients are required to return to the hospital at frequent intervals for inspection or aftercare which the practitioner could provide just as well in his surgery.

Out-patient Waiting-lists

200. Both the field survey and the postal inquiry indicate that the period of delay for making an appointment with a consultant in the out-patient department is most frequently two or three weeks, and that the department in which the longest delays occur is the orthopaedic department. Some practitioners in the postal inquiry added that, after the first consultation, further delay occurred before specialist treatment or investigation was carried out.

201. The majority of hospitals operate an appointments system, and the majority of general practitioners who were questioned on this matter found that it worked satisfactorily. The Committee agrees that appointments systems in out-patient departments are desirable. It heard also, however, a certain amount of criticism, and there seems to be room for improvement. For example, it was informed that at some hospitals all patients are instructed to attend at the same time, and then wait their turn, perhaps for two or three hours. In the view of the Committee this does not constitute an appointments system.

202. One cause of delay which was often mentioned in the inquiry and which appears to be a source of irritation to busy general practitioners was the fact that consultants saw only a limited number of patients at each session, and any excess numbers have to be given an appointment at a later date. There may be a good reason for this, as in the case of a surgeon who must restrict the number of consultations he gives in order to keep his operation list within practicable limits, or a consultant who is pressed to keep his other commitments, but some general practitioners have the feeling that consultants who are now salaried, are disinclined to work beyond the limits of their "notional half-day." This is contrasted with the lot of the general practitioner, who must con-

tinue his surgery until the last patient has been seen, no matter how late the hour.

203. The Committee suggested that the difficulty might be eased if separate sessions were held for new patients and "old" patients, appointments being made only for the "old" patients.

204. Both the general practitioner and his patient would undoubtedly feel more satisfied and have more confidence in the consultation if they were assured that all the letters were opened in the first instance by the consultant himself and that only he would delegate cases to a first assistant. The consultant would then be freer to see the more difficult cases himself and still remain available to advise the assistant when necessary. The Committee is informed that this system works efficiently in at least one out-patient department.

Minor Operations in Out-patient Departments

205. Long waits occur also for minor operations to be performed in the out-patient department. One cause of this is that many general practitioners send to hospital cases which, before the introduction of the N.H.S., they would have undertaken themselves. The Committee has already made recommendations on this matter.

206. The greatest delay occurs in the ear, nose, and throat departments; children may wait one or two years for the removal of tonsils. One unavoidable cause of this is the fact that, owing to the danger of subsequent poliomyelitis, operations on tonsils and adenoids are now performed only during the six months from November to April.

Admission to Beds

207. A large majority of the general practitioners in the postal inquiry stated that their patients had to wait for beds, and in the field survey 58% found their practice obstructed by this delay. The waiting period may be as much as a year for some non-urgent cases.

208. Where difficulties arise with emergency admissions they are usually great and frustrating. A feeling which found expression to a considerable extent was that increasing specialization brought with it so much sectionalization of the beds in a hospital as to remove flexibility. This has the effect of reducing the number of beds that can be made available for the admission of cases, particularly in emergency. The Committee does not dispute the necessity for increased sectionalization of hospital beds. It does, however, plead for the abolition of the administrative rigidity associated with such sectionalization.

209. If a general practitioner is associated with any particular hospital, to which he normally sends his cases, that hospital should share with him the responsibility of finding a bed for his patient in an emergency.

210. Another obstruction to the speedy turnover of beds is their occupation by patients who are waiting to see the consultant either before or after treatment. A new patient may occupy a bed for two or three days before he is seen by a consultant, and if it is necessary for two or more consultants in different branches of medicine to see him several days may elapse before a decision on procedure is taken. The Committee recommends that every effort be made to arrange for new patients to be seen on the day of admission by a member of the staff who is competent to make a decision on the disposal of the case.

Reports and Notifications to Practitioner

211. Complaints were received in both the field survey and the postal inquiry of the delay in receiving reports and notifications concerning their patients in hospital. The failure of the hospital staff to inform the general practitioner of the result of an out-patient consultation or of the discharge or death of an in-patient is not only discourteous but it also frequently places the doctor in a difficult or embarrassing position—for example, when the discharged patient comes to him for further treatment or when he hears of the death of his patient from the relatives. It also lowers the status of the practitioner in the eyes of his patients if they find that the hospital does not trouble to give him information.

212. In order to have evidence from both sides the Committee asked a group of consultants whether they sent an immediate report to the general practitioner concerned on the discharge of a patient from hospital. Of 44 consultants 23 replied "Yes" and 21 replied "No." The delay, which was in most cases up to one week, was usually explained as arising in the clerical or records department. Three stated that letters were written only on certain days.

213. There is a natural tendency on the part of the general practitioners to lay the blame for these shortcomings squarely on the shoulders of the medical staff, especially those of more junior status. The Committee urges that every effort be made to solve this problem, which is of very great importance to the practitioner in his treatment of and personal relations with his patient. It realizes that there are difficulties, especially where sufficient clerks conversant with medical terms are not made available to ease the burden borne by many a depleted house staff.

214. A suggestion which was made by a general practitioner and is already adopted by at least one consultant is that on discharge the patient be given a brief letter to present to his doctor. The Committee suggests that this procedure could well be more widely adopted. It also recommends, most emphatically, that when a patient dies in hospital the general practitioner should be notified immediately.

215. The Committee considered, without reaching a definite conclusion, whether it was desirable for a practitioner to be notified when a patient sent for consultation was transferred to another department or required some investigation. Some members thought that he should be informed before any decision was taken, because it was the responsibility of the general practitioner to decide whether the suggested further action should be taken and to select the consultant to be approached for the further opinion. Others thought that the reference back at every stage might cause needless delay, and they would be content for the consultant simply to inform the doctor of the action taken.

216. These difficulties would be minimized if the general practitioner were better known at the hospital and were able to take some part in the work, in accordance with the Committee's earlier suggestions. The result of closer contact between the general practitioner and the hospital would reduce formality in all sorts of ways, and would supplement formal notification with friendly discussion. The almoner is in a position to contribute another link between the general practitioner and the hospital. Whenever a patient is discharged from hospital there should be close liaison between his doctor, the almoner, and the health visitor.

XI. THE GENERAL PRACTITIONER AND THE STATE

217. Since 1911 the majority of general practitioners have combined State practice with private practice, their income being composed in part of capitation fees from the State for State patients and in part of fees assessed by themselves as the value of services rendered to private patients. One of the fundamental changes brought about by the N.H.S. was the severe curtailment of the field for private practice. Most general practitioners now receive all, or nearly all, their income from the State for the treatment of N.H.S. patients. While in theory this fact should make no difference to the quality of medical care, the change has brought with it many new problems. Some of these are concerned with finance and the practitioner's dependence upon a national capitation fee rather than upon his own assessment of fees. Some of them are of a more subtle nature and concern the practitioner's attitude towards his work.

218. The Committee's purpose in this section of its inquiry has been to ascertain whether the N.H.S. has had any adverse effect on the standard of general practice. Some of its questions, for example, attempted to find out whether there was any justification in the complaints frequently heard that general practitioners work much harder now than before July, 1948, and that much of their time is spent in dealing with trivial ailments which would previously have been treated by the patient at home.

Excessive Demands

219. Rather more than half the practitioners in the field survey and 80% in the postal inquiry feel that they are working harder now than before 1948, and 30% and 53% respectively feel that excessive numbers of unnecessary demands on their time are being made by patients. The tendency of some doctors to complain that a certain proportion of their time is spent in the treatment of "trivial" ailments needs scrutiny. There can, of course, be no firm definition of a trivial ailment, either from the patient's point of view or from the doctor's. A request for treatment which to one doctor is merely an annoyance may present to another material of real clinical interest or even a basis for research in the study of so-called trivialities. Moreover, who shall say without examining the patient whether a condition is "trivial"? If patients are encouraged by the profession itself to seek medical advice in the early stages of illness they cannot wholly be blamed if some of them approach the doctor unnecessarily. What seems trivial to the doctor may not be so to the patient, who may have no one else to turn to for help in his problem. Some doctors, especially the younger ones without long experience, may not be aware how helpless the patient may feel in his small troubles and what relief a sympathetic hearing can give him.

220. The Committee is of course aware that in most practices there are a few patients who make unreasonable demands and cause the doctor irritation out of all proportion to their number. It is also aware of the existence of the patient with the "shopping list." Its view is that, while it is important that patients should be encouraged to seek medical advice in the early stages of disease, it is reasonable to expect that the public might be educated to be more self-reliant and to become acquainted with the elements of first-aid and home nursing. Similarly the Committee feels that there is

room for some education of the public in the proper code of conduct in the doctor-patient relationship.

221. The investigator in the field survey had the opportunity of noting that this difficulty of unnecessary demands for service was not met in colliery practices which were formerly conducted as "club practices." These practices had already passed through the change which tends to occur in the attitude of the patient when the financial barrier to the doctor's service is removed, and the coming of the N.H.S. has had little effect on them. Other practices are now passing through a similar phase. Some doctors think that the peak has been reached and the demand is settling down to what is likely to be the normal in the new conditions. Others say that the demand remains at the peak. The Committee believes that the average number of services likely to be required of a practitioner in the future will remain higher than in the pre-N.H.S. years.

Prescribing

222. Overprescribing includes the prescribing of expensive equivalents instead of comparatively inexpensive medicaments, and the use of more popular, more complicated, and more expensive remedies in the place of simple inexpensive drugs which are therapeutically as effective. Some of these inexpensive drugs were proved remedies before the introduction of newer discoveries which have tended to be taken into wholesale, and sometimes indiscriminate, use.

223. The Committee believes that overprescribing plays at least some part in the magnitude of the nation's drug bill. But it does not believe that this is entirely the fault of general practitioners. A potent factor is the demand by patients for expensive preparations which have been recommended by hospitals or have been selected by the patients themselves in response to hearsay.

224. While the Committee recognizes that the General Medical Services Committee has the subject constantly under consideration, it would resist most strongly any attempt to restrict the liberty of any doctor to prescribe what is necessary for the patient. Nevertheless, it believes that many might with advantage review their prescribing habits, including a study of the *National Formulary, 1952*. The Committee believes that the *Formulary* forms an excellent basis for the self-education of the doctor in the art of prescribing at once economically and efficiently. It is of the opinion that all members of hospital staffs, especially house officers, should also be supplied with copies of the *Formulary*.

225. There is, here and there, a tendency to use a steam-hammer where nutcrackers will do. In past years the absence of remedies that now exist and are regarded by some almost as panaceas made it more easy to realize that nature has a part to play in the resolution of illness. Now there is danger, for example, of "sulpha" drugs taking the place of diagnosis.

226. The Committee feels that the nation's drug bill will continue to increase. At present it is difficult for the local medical committees to act in this matter as they are acted under the National Health Insurance because of the backlog which at present obtains in the pricing bureaux.

227. The profession is therefore urged to exercise the greatest care in prescribing in order to counteract the

inevitable rise in the drug bill. Discrimination in prescribing should be more widely taught in the schools, and it should be realized by all that economical prescribing is usually good prescribing.

Size of Lists

228. The reports in the field survey and the postal inquiry show that in 1951-2 the number of patients cared for by a practitioner lay most frequently within the range 2,000-3,500. There were undoubtedly some practitioners who found no great difficulty in properly looking after a full list of patients (4,000). There were others who felt compelled by economic necessity to care for more patients than they could, in their view, properly manage, although their lists were under 4,000. Yet others were finding difficulty in building up a list of patients large enough to give them a reasonable livelihood and sufficient clinical experience.

229. The Committee offers no solution to this problem, but it stresses its view that the mere size of list is by no means the only criterion of a good practice. The financial advantage of a large list has played too great a part in general practice under the N.H.S. It has been sometimes all-important, which is undesirable. It now remains to be seen whether the new financial arrangements will effect the necessary adjustments of these difficulties.

The General Attitude

230. One of the best tests of the efficiency of a medical service is whether the doctors operating it are reasonably happy and contented. The field survey and the postal inquiry agree in showing that about 55% of general practitioners are reasonably happy and contented in the N.H.S., excluding from consideration any question of finance. Obviously there is considerable room for improvement, but the proportion suggests that there is less downright opposition to the N.H.S. than is sometimes supposed. Practitioners are critical and feel restricted in the service they can render to their patients under the scheme, but, as the field investigator has found, they are in a receptive state of mind and are ready to make the scheme a better service if they are allowed the opportunities to do so.

XII. CONCLUSION

231. The ultimate question to which the Committee has sought an answer is whether the general practitioner of to-day is able to practise good medicine. It believes, on the evidence it has collected, that an unqualified affirmative answer cannot be given. If the scope and conditions of general practice are conducive to good work the right type of men and women will enter it and provide a high standard of service for their patients. If the scope and conditions fall short of a satisfactory basis for a career, general practice will either fail to attract the best type of medical practitioner or it will be pursued in a spirit of anxiety and frustration, to the detriment of the medical profession and of the community as a whole.

232. The results of the surveys suggest that about half the general practitioners in the N.H.S. are reasonably happy and contented in their work, and that a similar proportion may be described as "good" doctors. It is significant that in the field survey the youngest age group has the highest proportion of doctors in the category "good"; in the other two age groups the highest pro-

portions are classed as "adequate." If the young entrant to general practice is indeed of a high quality, it is all the more incumbent upon those responsible for the organization of the N.H.S. to ensure that he has the "tools" to do his job.

233. Two obstacles to the improvement of general practice to-day lie in the insufficiency of personal contact between general practitioners and practitioners in other branches of practice and in the separation, in both practice and administration, of the three main branches of medicine—namely, general practice, hospital practice, and public health practice. From these two defects flow most of the general practitioner's difficulties. The tendencies to disunity are not new; they have been creeping on the profession for at least thirty years. They are due, historically, to the continuous broadening of the field of medicine, the consequent specialization, and the different rates of development of the different sections of medical practice. The progress of general practice has been overshadowed by the rapidity of the growth of other branches, and the general practitioner has not shared in the limelight of his specialist colleagues or in the local publicity of the public health services.

234. The practice of good medicine is also endangered when clinical activity has to be subordinated to administrative duties in the N.H.S. and when excessive demands for service curtail the time available for the adequate knowledge and treatment of individual patients. The doctor consequently loses interest and feels frustrated; one young doctor replied to the postal inquiry, "Only rarely do I feel I am really practising medicine." This barrier to good medicine is intensified by the fact that insufficient remuneration leads many doctors to accept larger lists of patients than they can efficiently serve—some may even be selective and refuse to accept the chronic sick or those who are likely to require much attention. The general public, too, must share some of the responsibility for the failure to allow general practice to achieve its fullest scope. The growing emphasis in the public mind on hospitals and specialists at the expense of the general practitioner reached its climax at the introduction of the N.H.S., when, having been promised a complete and "free" medical service, a large proportion of patients demonstrated their opinion of general practitioners as suppliers, on demand, of prescriptions and certificates. Although, as Lord Dawson said, "Man sick is individualistic," and in real illness turns, as always, to his own doctor for help, the time and skill of the general practitioner are too often abused by patients who have no true need of his services or who regard him as only an intermediary to the hospital service. The proper discipline of his patients is, of course, in the hands of the general practitioner himself, but some of the effort which is given to public instruction in the wonders of scientific medicine and the marvels of the modern hospital service might with advantage be devoted to informing the public of the functions of the general practitioner and of the way in which his services should be sought.

235. That there is something wrong seems to be shown by the fact that, although there is a substantial annual increase in the number of principals in general practice, there are still young practitioners who cannot find the kind of practice they want. It is said that they all seek the easier practices in the more favoured parts of the country. The Committee cannot help feeling that some young men expect to get on rather too early and too

quickly. They want the cream before they milk the cow. On the other hand, there are young practitioners who say they cannot find the type of practice where they can "really practise medicine" and not be merely finger-posts. The Committee believes it to be the case that at present there are more opportunities for finger-posts and financial advantages for the practitioner who is inclined to be superficial and who is easy with prescriptions but reluctant to sign on the chronic sick. There are too few openings and inducements for the careful, keen practitioner who likes to be thorough in his examinations and treatment and to have time for study and reflection.

236. The general trends of practice and the dangers threatening general practitioners were recognized by the Association in its *General Medical Service for the Nation* in 1929, by the Medical Planning Commission in 1942, by the profession's negotiators in the years following the issue of the Beveridge Report, and by many of the more thoughtful members of the profession. All this work did not stem the tide, and the practicalities of the N.H.S., with its deliberate tripartite administration, only exacerbated already existing tendencies, with the result that many general practitioners now feel that they are entirely separated and isolated from their colleagues in other branches and left with a contracted scope of practice.

237. One of the greatest services which the present generation of practitioners and administrators could render to the profession would be the reversal of these disintegrating tendencies and the restoration in the professional and the public mind of the sense of the oneness of Medicine. There must be more understanding that, on a long view, the interests of all branches of the profession are the same and that no one section can continue to prosper at the expense of the others. All categories and individuals are interdependent, so that if one group is injured or depreciated the whole balance of medical practice is upset and the standard of service to the community is lowered. General practice is being injured at the present time by disunity and lack of co-ordination. There is urgent need for a sense of professional unity and for deliberate and early action to give the general practitioner his proper place in a united profession, opportunities and freedom to exercise his skill, personality, and initiative to the fullest extent, and an environment of practice in which he may fulfil his sense of vocation as family doctor and personal medical adviser.

SUMMARY

The General Practitioner

1. Those responsible for the selection and training of medical students should have regard to the broad general education and the "all-round" knowledge and skill required for general practice. (Paras. 15-24.)

The Doctor-Patient Relationship

2. The conditions of general practice should be such as will encourage the maintenance of the highest possible standard of the doctor-patient relationship. (Paras. 25-40.)

The General Practitioner's Range of Service

3. In order to permit continuity of care and general responsibility it should be an accepted principle in all hospitals that reasonable opportunities are provided for

general practitioners to visit their patients from time to time and to discuss their progress with members of the hospital staff. (Paras. 42-5.)

4. Arrangements for a division of work in a multiple practice should be such as will encourage the principle of continuous responsibility. (Para. 47.)

5. There should be close and active co-operation in the field of health education and preventive medicine between the general practitioner and the public health department. (Para. 50.)

6. So far as is practicable, occupational health schemes should employ general practitioners in a part-time capacity. (Paras. 51-2.)

7. The conditions of general practice should be such as will give the practitioner the time he needs for each patient. (Para. 53.)

8. The general practitioner should undertake for National Health Service patients those minor operations which, before the Service was introduced, he performed as part of clinical treatment in the ordinary course of general practice. (Paras. 58-61.)

9. Consideration should be given to the possible advantages of granting general practitioners facilities in local hospitals for performing minor surgical procedures for their patients and give immediate aftercare. (Para. 62.)

10. General practitioners and members of hospital staffs should discuss and decide upon their respective ranges of activity in minor surgery and other fields. (Para. 62.)

11. Account should be taken of the difficult position in which the pressure of events has placed the general practitioner with regard to certification. (Paras. 63-4.)

12. General practitioners in an area should meet from time to time to determine and agree upon a "common certification front." (Para. 64.)

13. A general practitioner who wishes to develop a specialty, either within his own practice or with a view to becoming a consultant, should be given opportunities to do so, with a minimum of interference with the management of his practice. (Paras. 66-8.)

14. Midwifery should be regarded as an integral part of general practice, and every possible encouragement should be given to general practitioners to undertake it. (Paras. 69-87.)

15. General-practitioner maternity units should be established for confinements which, but for social circumstances, would have taken place at home. (Paras. 74-5.)

16. The general practitioner and the midwife should work together as a team from the first antenatal examination. (Paras. 76-83.)

17. The use of the term "maternity nurse" should be discontinued when the midwife is working with the doctor. (Para. 83.)

18. The present obstetric lists maintained in England and Wales should be replaced by the Scottish procedure—that is, that every registered medical practitioner who indicates his willingness to practise obstetrics regularly should automatically be eligible to have his name included, if he so desires, in a list of practitioners undertaking to provide midwifery services, and should receive the full fee. (Para. 84.)

19. The maternity services of the local health authority and the general practitioner should be complementary and not alternative, and, in order to preserve continuity of care of the patient, it should be an accepted principle

that the proper person to conduct antenatal examinations is the doctor who will be responsible for the confinement. (Paras. 85-7.)

20. In order to co-ordinate the various sections of the service dealing with the prevention and care of tuberculosis, there should be the closest possible co-operation between the general practitioner, the chest physician, and the tuberculosis visitor. (Paras. 88-91.)

21. In each area beds should be available at reasonably short notice for cases of tuberculosis requiring early admission and for any acute emergencies. (Para. 91.)

22. Old persons who are acutely ill should be treated in a general hospital in the same way as a younger person, the same principles for urgent admission being applied. (Para. 93.)

23. An appropriate medical officer should visit and examine every aged, infirm, or chronic sick patient proposed for the waiting-list for institutional care, and assess the degree of priority or urgency in consultation with the family doctor. (Para. 94.)

24. More Eventide Homes should be provided. (Para. 95.)

25. There should be a substantial expansion of the home help service, including night attendance, for the aged and chronic sick. (Paras. 96-7.)

The Organization of General Practice

26. The attention of general practitioners should be drawn to the advantages of non-medical help for clerical and allied duties. (Para. 109.)

27. The attention of the telephone authorities be drawn anew to the pressing requirements of the profession for easily arranged transfer of messages. (Para. 114.)

28. Any system of health centres should come after further experiment, including the development of communal surgeries set up by general practitioners themselves, rather than be imposed from outside the profession. (Paras. 118-22.)

The General Practitioner and his Colleagues

29. Properly devised local rota schemes are valuable as a method of providing relief for individual practitioners. (Para. 128.)

30. Principals should be encouraged in all possible ways, including the payment of compensation for the part of the practice concerned, to enter into partnership rather than employ permanent assistants. (Paras. 135-9.)

31. The various suggestions for postgraduate education made in the Cohen Report should be put into operation wherever possible. (Para. 141.)

32. Wherever possible, combined clinical meetings between general practitioners and consultants should be held at local hospitals, the academic interest being given a social background. (Para. 142.)

33. The idea of senior medical students being associated with general practitioners, especially in the neighbourhood of teaching hospitals, should be explored. (Para. 150.)

The General Practitioner and the Public Health Service

34. Endeavours should be made by both medical officers of health and general practitioners to improve the contact and understanding between the two branches of practice. (Paras. 152-5, 165-6.)

35. The medical officer of health and the general practitioners in the area should together arrange some

system of liaison between the different groups of workers who are each contributing in their own fields to the welfare of the patients—namely, general practitioners, midwives, district nurses, and health visitors. (Para. 154.)

36. Just as there is provision in the model scheme for the M.O.H. to be a member of the local medical committee, so there should be statutory provision for general practitioners nominated by the local medical committee to be included in the membership of the health committee of the local health authority. (Paras. 156, 122.)

37. All concerned should take active steps to implement the agreement between the Association and the Society of Medical Officers of Health on the reference of school-children to consultants. (Paras. 157-8.)

38. General practitioners should make every effort to maintain personal contact with district nurses, the clinical details of whose work should be arranged in consultation with the patient's doctor. (Paras. 159-60.)

39. Every effort should be made to secure an adequate number of district nurses. (Para. 159.)

40. The health visitor should always get into touch with the patient's doctor so that she may work in close co-operation with him in every case. (Para. 164.)

The General Practitioner and Consultants

41. General practitioners and consultants should be urged to take positive steps to achieve the closest possible co-operation. Opportunities for both professional and social contact should be actively pursued. (Paras. 167-72.)

42. Where appropriate, hospital authorities should consider the introduction of suitable forms, acceptable to both the general practitioner and the consultant, for the use of general practitioners who desire them when referring patients to hospital. (Para. 175.)

43. Administrative arrangements in hospitals should be such that letters addressed to consultants are not seen by the patient or by lay staff other than the confidential clerks concerned. (Para. 176.)

44. A domiciliary consultation should be a consultation with both the general practitioner and the consultant present, and only in exceptional circumstances should a consultant conduct such a consultation in the absence of the general practitioner. (Para. 178.)

45. Every prospective consultant should consider the advantages, both to medical practice and to himself, of including in his training a period in general practice, and it is desirable that he should be afforded opportunities of gaining such experience. (Paras. 179-80.)

Hospital Facilities for the General Practitioner

46. Ideally, every general practitioner should be positively associated with a hospital. In order to achieve this it will be necessary for hospitals to take active steps to encourage closer contact. (Paras. 182-3.)

47. The widest possible application should be accorded to the principle that general-practitioner beds should be available to all practitioners. (Paras. 184-7.)

48. Clinical assistantships should be available to general practitioners on the lines suggested in the Association's Report on *The Association of the General Practitioner with Hospital Work*. (Paras. 188-90.)

49. General practitioners should have direct access to pathological and radiological facilities. (Paras. 191-5.)

50. The use of the facilities of the special departments should be regarded as a consultation between the general practitioner and the pathologist or radiologist. (Para. 195.)

51. The general practitioner should be encouraged to discuss the results of investigations with the pathologist or radiologist when such a discussion seems desirable. (Para. 195.)

52. In order that physiotherapy services may be used to the best advantage, the advice of a suitably trained general practitioner should be available to the physiotherapy department. (Paras. 196-7.)

The General Practitioner's Relations with Hospitals

53. A searching examination of the appointments system in hospital out-patient departments is desirable with a view to eliminating the long waits, special consideration being given to the possible advantages of new cases being seen without appointment. (Paras. 200-3.)

54. A patient referred to a particular consultant should be seen by an assistant only after an express delegation by the consultant in the individual case. (Para. 204.)

55. The availability of beds for admissions should be improved by substituting flexibility for administrative rigidity. (Paras. 207-8.)

56. The hospital to which the general practitioner normally sends his cases should share with him the responsibility of finding a bed for his patient in an emergency. (Para. 209.)

57. Steps should be taken to reduce the time-lag between admission to hospital and the initiation of treatment and between the cessation of treatment and discharge. (Para. 210.)

58. Immediate notification, with the relevant information, be given to the general practitioner on the discharge of a patient from hospital, after attendance as an out-patient, and on reference to another consultant. (Paras. 211-16.)

59. The general practitioner should be notified immediately when a patient of his dies in hospital. (Para. 214.)

The General Practitioner and the State

60. Consideration should be given to educating the public to be more self-reliant and to become acquainted with the elements of first-aid and home nursing. (Para. 220.)

61. General practitioners should review their prescribing habits, including a study of the *National Formulary* 1952. (Paras. 222-7.)

62. All members of hospital staffs, especially house officers, should be supplied with copies of the *National Formulary*. (Para. 224.)

Unity of the Profession

63. General practitioners should take active steps, even at some slight personal sacrifice, to establish friendly relations between them and their general-practitioner colleagues.

There are differences that can be composed and gaps that must be closed between the three branches of the Service. The Committee does not believe that multiplication of liaison committees alone will have the desired effect, and feels that in order to achieve this it

Questions Answered

On Retirement

Q.—On the assumption that my net remuneration as a general practitioner under the N.H.S., has been £1,500 per annum since July, 1948: (1) What would be the lump sum that I would be entitled to if I had retired at the end of the first five years? (2) What would be my pension after ten years' service from July, 1948, if my net remuneration remained the same up to that time?

A.—(1) After five years' service the practitioner would be entitled to a lump sum retiring allowance equal to the greater of (a) $4\frac{1}{2}\%$ of total superannuable remuneration = £337, or (b) a sum equal to the amount of his contributions with interest = £450+compound interest at $2\frac{1}{2}\%$. But, as both these amounts are less than his average remuneration over the last three years' service (£1,500), he could apply to the Superannuation Division of the Ministry of Health for his retiring allowance to be increased by the capital value (surrender value) of the death gratuity that would normally become payable, and then in such a case no death gratuity would become payable later.

(2) After ten years' service the practitioner would be entitled to a pension of $1\frac{1}{2}\%$ of total net remuneration = £225, plus a lump sum retiring allowance of £675 if unmarried and £225 if married.

Sickness Benefits

Our answer to the question, "Are sickness-benefit payments liable for income tax?" (*Supplement*, August 29, p. 91) was to the effect that tax was not payable. This answer was incomplete, for, as our expert writes, "if the sickness benefit continues for the whole of any one financial year—that is, the year ending on April 5—the payments are then regarded as income assessable to income tax on the recipient."

Correspondence

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

Cost of Prescribing

SIR.—The small amount of comment in your correspondence about the recently distributed classification of proprietary medicines and the accompanying letter of exhortation from Sir John Charles suggests that our passive profession willingly sits on the increasing spikes in the N.H.S. fence. If indeed preparations in categories 5 and 6 are in the opinion of the Ministry of Health not of proved therapeutic value, it is surely its responsibility and bounden duty, strongly supported by the Treasury, to forbid the use of these "worthless" drugs under the N.H.S. Unfortunately neither the Ministry nor its advisers have the courage so to do, and no Government has cared to take the step after the inauguration of the "free" health service which was to supply all remedies to everyone in the country free of charge, regardless of nationality. True, such a ban might embarrass some doctors, but I doubt if either doctors or patients would really suffer unduly by this intrusion upon our freedom.

Paragraph 4 of Sir John Charles's letter, perhaps unwittingly, is a veritable sword of Damocles poised over the profession's head, for, though our prescribing of these preparations will be judged by our colleagues on local medical committees, theirs is not always the final word. There is also the possibility of genuine variance in the opinions of local medical committees, resulting in patients

will be necessary for all individuals concerned in all branches to concentrate their attention rather less on their own individual problems and to bring it to bear on the problems of the N.H.S. as a whole. The Committee recommends that the most urgent consideration be given at all levels to the vast problem of how to achieve the closest possible integration in the Service.

APPENDIX

SOME OTHER INQUIRIES INTO GENERAL PRACTICE

The present condition of general practice is engaging the attention of other bodies both within and outside the British Medical Association. Some of these are concerned with the whole field, others with particular aspects. The Committee thinks it may be useful to list below the various inquiries which it knows to be in progress. Such material as is already available from these inquiries has been taken into consideration.

Central Health Services Council.—A committee was appointed early in 1951, under the chairmanship of Sir Henry Cohen, to study general practice under the National Health Service.

Medical Practices Committee.—Annual Reports of the Medical Practices Committee for England and Wales and of the Scottish Medical Practices Committee on the distribution of the profession.

British Medical Association.—The British Medical Association and the General Medical Services Committee are continuously occupied with matters affecting the general practitioner. Among recent special reports are: "General Practice and the Training of the General Practitioner," 1950. "Report on Health Centres," 1949. The Committee acknowledged the help received from the many Divisions and Branches which set up study groups or special subcommittees to consider the Cohen Report on "General Practice and the Training of the General Practitioner."

Medical Research Council.—An intensive study is being made, under the auspices of the Council, of the work of a single ordinary general practice in London, and of the "needs" of the people in it, by the Social Medicine Research Unit at the Central Middlesex Hospital, Willesden, London, N.W.10.

Scottish Health Services Council.—The Committee welcomes the report of a special committee on the "General Practitioner and the Hospital Service," which was published in December, 1951, and endorses the many valuable suggestions made.

Nuffield Provincial Hospitals Trust.—On behalf of the Trust Dr. Stephen Taylor is making a detailed study of a number of well-organized practices where doctors have already grouped themselves together, adapted their premises, and availed themselves of appropriate ancillary help. The purpose is "to examine the best—to see how good it is and how far it deserves to be set up as a model for others to follow." The Trust is also conducting experiments "to test and demonstrate various conceptions of a health centre. Three are at present in progress: (i) a teaching health centre attached to the medical school of the University of Manchester; (ii) a diagnostic health centre for the new town of Corby, in Northamptonshire; and (iii) a simple type of health centre for the new town of Harlow, in Essex. Another experiment which the Trust has initiated is concerned with the improved co-ordination of medical care. A preliminary survey is being carried out in the area of the East Anglian Regional Hospital Board of (a) arrangements for specialist services; (b) maternity services, urban and rural; (c) the treatment and care of the chronic sick of all ages; and (d) mental health services, with particular reference to co-ordination between the various authorities.

receiving their category 5 or 6 medicine in one area without cost to the doctor, and either being refused it or supplied with it at the doctors' expense in another. And quite a considerable bill could be run up in this manner before the unfortunate doctor is called to account for his action.

Why should it be the doctor's responsibility to refuse to prescribe, or at least endeavour to dissuade his patient on behalf of the Ministry? In some areas such action is believed to be due to the doctor trying to economize in his personal expenditure, and this arouses ill feeling. Why should the doctor have to justify the use of drugs in which some patients at least appear to have so much confidence, and from which they thereby derive some therapeutic benefit, if only psychological? What about the cough bottles in the N.F. which are revered by so many despite the scorn poured upon them in our medical schools?

Surely the onus of deciding whether or not a drug is of proved therapeutic value in any individual patient must rest on the doctor alone and without threats of investigation, even by his colleagues. If, on the other hand, the Ministry is anxious about costs and has no faith in our discrimination, as appears to be the case, let it assume full responsibility by investigating all new drugs and issuing certificates of merit for manufacturers to include in their advertisements in the medical press.

Let us get off our fence, remove the sword of Damocles, and be free to practise medicine knowing precisely where we do stand in relation to our patients and the Ministry. A definite ruling in this matter would help us in our dealings with the general public, who would then happily blame the Ministry of Health and not us for refusing the supply of some of their favourite remedies.—I am, etc.,

Crook, Co. Durham.

G. H. PEARSON.

Investigation of Prescribing

SIR,—We find that the implementation of the regulations governing the investigation into the prescribing of preparations which may or may not have been prescribed as drugs is rather cumbersome and confusing. At the same time matters of principle are involved.

The article on this matter in the *Supplement* of August 1 (p. 68) does little to simplify the procedure, nor does it clarify the doctor's position in

(a) obtaining a patient's consent to disclosure of diagnosis (i.e., whether this is the responsibility of the doctor or the executive council);

(b) the case where the patient refuses consent to disclose clinical details either to lay officials or to a doctor secretary or chairman of a local medical committee.

In our opinion the fact that the procedure involves a matter of principle is of paramount importance. The principle involved—that of disclosure of a patient's diagnosis in a matter which is of no direct concern to the patient himself—is so fundamental that we feel there should not be the slightest confusion in the procedure to be adopted. We therefore feel that, before any details are requested of the doctor, written consent to the disclosure of diagnosis should first be obtained from the patient. The patient should be asked if he is willing that details be disclosed to

(a) lay member(s) of executive council; or

(b) doctor member of local medical committee; or

(c) neither.

We feel that the onus of obtaining this consent should be on the body initiating the inquiry—i.e., the executive council. With this written consent of the patient the clerk of the executive council may then approach the doctor, who can furnish clinical details to either the executive council or the local medical committee.

Should the patient's consent be absolutely withheld, then we feel the investigation could not proceed unless taken to law.—We are, etc.,

B. TAYLOR.
J. G. WATT.

West Smethwick, Staffs.

Association Notices

GROUP COMMITTEE ELECTIONS

The following have been elected to Group Committees to fill vacancies caused by the annual retirement of one-third of the members:

Anaesthetists Group Committee.—A. H. Galley, T. C. Gray, R. P. Harbord, R. Jarman.

Consulting Pathologists Group Committee.—D. Cappell, Cuthbert Dukes, J. D. Allan Gray.

Dermatologists Group Committee.—G. W. Bamber, I. H. McCaw.

Full-time Non-professional Medical Teachers and Research Workers Group Committee.—B. N. Brooke, M. M. Bull, G. I. C. Ingram, J. Joseph, R. C. Nairn, A. H. T. Robb-Smith, H. B. Stoner, Thomas Symington, Ronald Woolmer, K. S. Zinnemann.

Orthopaedic Group Committee.—R. Guy Pulvertaft, R. J. W. Withers. One vacancy.

Otolaryngologists Group Committee.—J. H. Otty, R. D. Owen. A. Russell, Gavin Young.

Ophthalmic Group Committee.—N. P. R. Galloway, A. F. Gilbert, R. Affleck Greeves, J. J. Healy, O. Gayer Morgan, J. R. Wheeler.

Physical Medicine Group Committee.—I. H. M. Curwen, William Dunham, J. B. Stewart.

Psychological Medicine Group Committee.—Doris Odium, J. D. W. Pearce, J. Valentine.

Radiologists Group Committee.—F. H. Kemp, J. G. McWhirter, D. C. Porter, C. Wroth. One vacancy.

Tuberculosis and Diseases of the Chest Group Committee.—T. W. Davies, H. Ramsay, F. Ridehalgh.

Venereologists Group Committee.—D. J. Campbell, W. N. Mascall, I. N. Orpwood Price, Mary M. Shaw.

A. MACRAE,
Secretary.

Diary of Central Meetings

SEPTEMBER

- 25 Fri. Armed Forces Committee, 2 p.m.
- 29 Tues. Building Committee, 2 p.m.
- 29 Tues. Grants Subcommittee, Organization Committee, 2 p.m.
- 30 Wed. Occupational Health Committee, 11 a.m.
- 30 Wed. Catering Committee, 2 p.m.
- 30 Wed. Consulting Pathologists Group Committee, 2 p.m.
- 30 Wed. Consulting Pathologists Group, 4.30 p.m.

OCTOBER

- 1 Thurs. Central Consultants and Specialists Committee, 12.30 p.m.
- 2 Fri. Alcohol and Road Accidents Committee, 11 a.m.
- 2 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.
- 2 Fri. Registrars Group Council, 2 p.m.
- 7 Wed. Private Practice Committee, 11.30 a.m.
- 8 Thurs. Amending Acts Committee, 2 p.m.
- 8 Thurs. Scientific Exhibition Subcommittee, Arrangements Committee (Glasgow, 1954), 8.30 p.m. (at B.M.A. Regional Office, 234, St. Vincent Street, Glasgow).
- 9 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
- 9 Fri. Ophthalmic Group Committee, 2 p.m.

Branch and Division Meetings to be Held

CITY DIVISION.—At Hackney Hospital, Homerton High Street, E., Wednesday, September 30, 1.45 p.m., clinical meeting; 2.45 p.m., film: "Some Aspects of Accessible Cancers—(i) Cervix and Uterus; (ii) Rectum."

DERBYSHIRE BRANCH.—At New Bath Hotel, Matlock Bath, Sunday, September 27, 6 p.m. Annual meeting, address by Dr. D. P. Stevenson (Deputy Secretary, B.M.A.).

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, S.E., Friday, October 2, 8.30 p.m., meeting. Dr. R. Donald Teare: "Homicide" (lantern).

MID-CHESHIRE DIVISION.—At Unicorn Hotel, Altrincham, Wednesday, September 30, 8 p.m., annual meeting. Address by Dr. Thomas Christie, chief medical officer, Holloway Prison.

RUGBY DIVISION.—At Grand Hotel, Rugby, Thursday, October 1, 9 p.m. Film: "Atomic Warfare—Medical Aspects and Civil Defence." Preceded by informal supper at 7.45 p.m. for 8 p.m.

WEST SUSSEX DIVISION.—At Burlington Hotel, Worthing, Wednesday, September 30, 6.30 p.m., joint meeting with Pharmaceutical Society of Great Britain, Worthing and District Branch. Address by Dr. G. R. Boyes: "Insulin Zinc Suspensions."

WIGAN DIVISION.—At Lewis's Restaurant, Wallgate, Wigan, Thursday, October 1, 8.15 p.m., annual general meeting.

WINCHESTER DIVISION.—At Royal Hotel, Winchester, Saturday, October 3, 7 p.m. Annual meeting and dinner; address by Dr. O. C. Carter.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 3 1953

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GENERAL MEDICAL SERVICES COMMITTEE

A meeting of the General Medical Services Committee was held on September 17, with Dr. A. TALBOT ROGERS in the chair.

Dr. H. C. Faulkner, of London, who had been appointed to represent the Medical Practitioners Union in place of Dr. J. E. Outhwaite, was introduced and welcomed.

Dr. M. Sorsby was appointed a member of the Rural Practices Committee in place of Dr. F. Gray, and Dr. F. M. Rose and Dr. I. G. Innes were nominated to the panel from which the professional member of the Tribunal is appointed.

The date of the Annual Conference of Representatives of Local Medical Committees was fixed for June 3, 1954.

The "National Formulary"

The adequacy of general-practitioner representation on the Joint Formulary Committee of the British Medical Association and the Pharmaceutical Society gave rise to discussion. Dr. A. B. DAVIES, a general-practitioner member of the Joint Committee, said that, when it came to voting, yet the general practitioners were outnumbered every time, yet the *National Formulary* was predominantly a general-practitioner matter.

Dr. H. G. DAIN said that the constitution of the Committee "appalled" him. He had no idea it had developed in the way it had done.¹ It included a number of people whose direct interest in the subject was slight, and the pharmaceutical representation was disproportionately large. Yet the object of the *National Formulary* was to provide general practitioners with an easy method of prescribing, using a shortened formula. General practitioners should be in control.

It was agreed to invite the Council to review the constitution of the Joint Committee and to recommend that it should include a substantially higher number of G.P.s. It was understood that any reorganization could not take place for a year.

General Practitioners on Regional Hospital Boards

Tables were furnished to the Committee showing the present state of general-practitioner representation on regional hospital boards. At present each board included a general practitioner.

Dr. A. BEAUCHAMP said that nobody seemed to know on what principles the Ministry appointed general practitioners to these boards.

¹ There are 36 members of the Joint Committee, four of whom are appointed by the General Medical Services Committee and the remainder by some nine other bodies.

The CHAIRMAN said that those chosen were not regarded as representatives of any particular body, but as people able to give sound advice about the hospital service. The Ministry should be told that not only should there be at least one general practitioner on each board, but that there should be one general practitioner who was in regular touch with his colleagues in different parts of the region who could inform the board of such problems as arose, and that the Committee could furnish nominations. If the Ministry thought that, in addition, other general practitioners would be useful in that region and deserved a place on the board there would, of course, be no objection.

Discussion also took place on general-practitioner representation on hospital group medical committees. This matter was deferred until the next meeting, and in the meantime it was suggested, and agreed, that in view of the complexity of administrative set-up a kind of "genealogical tree" showing the derivation and functions of the various hospital committees should be included in the documents for the next meeting.

General Practitioners Working in Hospitals

The CHAIRMAN said that negotiations had been taking place in Committee "B" of the Medical Whitley Council on the terms upon which general practitioners should be employed in hospitals. The view expressed in the General Medical Services Committee had been that no practitioner working as a clinical assistant under supervision should be paid less than the rate laid down in the terms and conditions of service—namely, £175 per annum per weekly half-day. The Ministry, however, considered that this rate should apply only to practitioners in independent charge of a hospital unit who were not directly responsible to a consultant or S.H.M.O. in a specialty, and that a suitable rate for general practitioners working under supervision should be negotiated through Whitley machinery. The Management Side of Whitley Committee "B" had supported a rate of £125 per weekly session and based this rate on the remuneration of hospital registrars. The CHAIRMAN went on to point out that general practitioners were not coming to hospitals to train themselves for some future consultant post but to help in the work of the hospital; often they had had some years of postgraduate training. The figure of £125 was based on comparison with the earnings of a registrar, and also on the idea that the people concerned would be those not fully extended in general practice, to whose income an additional £125 a year might be welcome. He reminded the Committee that any extra money that came to these practitioners would come indirectly out of the general practitioners' pool.

Dr. D. F. HUTCHINSON pointed out that hospital boards were restricted in the amount of money they could spend, and were having a job to make ends meet. Any reserve was put towards increase in consultant staff, and there could be no additional allocation to the boards for general-practitioner service.

Dr. J. C. ARTHUR discussed the matter from the trade-union angle—"the rate for the job." If they accepted £125 as the remuneration for a general practitioner doing a weekly session which might well last three hours, the rate for the job was being cut. He felt that the figure should not be less than £175.

Dr. WAND said that their long-term policy was to establish the general practitioner as part of the hospital life of the country. The average net remuneration of the established general practitioner in this country was now £2,000 net. If the rate for hospital work was accepted as suggested by the Ministry in the region of £1,300 or £1,400, the general practitioner who was doing good work in his own practice was, when he went into hospital, being remunerated at a lower rate for his job. Their purpose was to build up a better general-practitioner and hospital service in this country, and this should not be diverted by the argument that the cheaper rate would assist hospital finance. Even the figure of £175 was too low and should be regarded as minimal. The experienced general practitioner who had been through the mill of general practice for some years was not to be classified with the comparatively young registrar who was earning £1,300 a year.

The CHAIRMAN said that he thought the view of the Committee was in favour of a consolidated method of employment of general practitioners in hospitals in all posts other than those of S.H.M.O.s and consultants, and, having established that principle, the appropriate payment should be negotiated on the understanding that the figure must bear relationship to the payment in other parts of the Service.

This view was generally accepted, and a group of members were nominated to discuss the matter with the Joint Committee (representing the Central Consultants and Specialists Committee and the Royal Colleges) and its Working Party. The members nominated were Drs. Talbot Rogers, A. Beauchamp, D. F. Hutchinson, M. Parkes, F. M. Rose, and S. Wand.

Accommodation in Surgeries and Waiting-rooms

The Committee considered paragraph by paragraph a draft letter which it is proposed to send to individual practitioners on the standard of accommodation in surgeries and waiting-rooms. The letter stated that it was considered neither practicable nor desirable to lay down minimum standards. Any necessary improvements should come about spontaneously from the desire of the doctors concerned to see that their premises were compatible with the prestige and status of general practice in the Service.

Dr. BEAUCHAMP said that there were instances in his own city of Birmingham where surgery and waiting-room accommodation was not satisfactory, and in which the doctor concerned had been approached by the local medical committee. He was sure that the local medical committee was the right body to intervene if intervention was necessary.

Dr. WAND said that it must be made clear that it was the doctor's job to keep his premises in decent order. But the maintenance of practice premises was a legitimate expense, and the cost of any improvements might be a matter for discussion between the accountant on behalf of the practitioner and the income-tax inspector.

It was agreed that the letter, after revision, should have the widest publicity amongst general practitioners. It was also suggested that advice should be given to local medical committees on the way in which they could help.

Another draft letter to local medical committees, which was approved, concerned the need for taking the greatest possible care in issuing certificates, and repeated a practi-

tioner's ethical obligations and the rules for the issue of certificates which are required for National Insurance purposes.

Hospital Reports to the Patient's Doctor

It was reported that the Central Consultants and Specialists Committee had considered a resolution of the Representative Body calling for the Ministry to instruct hospitals that on a patient's discharge a preliminary note containing diagnosis and treatment should be sent to the patient's doctor, followed by a complete report, but that after some discussion the committee had decided that action on the lines suggested was not necessary in view of the fact that it was already an instruction to hospital staff to notify general practitioners of the discharge of their patients.

Several members of the General Medical Services Committee declared from their experience that such an instruction was very necessary. Dr. M. SORSBY said that it was not uncommon for a patient to come to the surgery three or four times after his discharge and still no hospital report was available. Sometimes the practitioner had to telephone or write for it, and it was he who always got the back-wash—"Why haven't you got the report?" The patient was inclined to blame, not the hospital officer, but the general practitioner if the report was not forthcoming. It was high time to tell the hospitals that something should be done in this matter. It was not enough to plead changes of staff or shortage of staff.

Dr. HOWIE WOOD said that in his area there was a rule to this effect for house-officers, and as a result G.P.s had had no difficulties. It was of no use making a request; it should be inserted in the terms of service and then it could be enforced.

Dr. WAND said that the Committee should associate itself with the resolution of the Annual Representative Meeting and indicate to the Consultants and Specialists Committee that if they declined to take action the matter would have to be referred to Council as it was a Representative Body decision.

The Committee indicated its accord.

It was agreed that the Consultants and Specialists Committee should be informed to this effect.

Assistants and Young Practitioners

Comment was made on the lack of nominations for the Assistants and Young Practitioners Subcommittee. Communications had been sent to all members on the electoral roll in the five regions, but only two nominations of assistants (one of them received long after the closing date) and three nominations of unestablished principals had been received, leaving five places unfilled.

Some members urged that a letter be sent to assistants and young practitioners pointing out the importance of this committee; others suggested that it looked as though these people were satisfied with their lot.

The CHAIRMAN said that since the subcommittee had been set up it had played a useful part, and it would be regrettable to see it pass out of existence. But unless it was a real subcommittee it would have to be considered at the end of the session whether it should be continued. Before allowing this to happen, however, he suggested that a further letter be sent out, explaining what had happened, and asking again for nominations. This was agreed to.

A.R.M. Resolutions

The Committee then studied the many resolutions of the Annual Representative Meeting which bore upon its work and decided upon appropriate action where such action was required. On the resolution that ways and means be explored to make it easier for general practitioners to change practice it was agreed to set up a small subcommittee to go into the matter. The following were nominated: Drs. Talbot Rogers, Dain, Cardew, Swanson, and Williams.

Other Business

Questions were raised on a communication from the Ministry enclosing a proposed preface to the price lists of proprietaries and corresponding *National Formulary* preparations which was expected to be ready for issue about October 1. Dr. CARDEW pointed out that it was the right of the doctor to prescribe what drugs he thought best for his patient; if a committee were allowed to take these decisions it would form an unfortunate precedent. The CHAIRMAN explained that there was no veto about it. If a doctor could justify excessive or extravagant prescribing, well and good. The Public Relations Officer said that two Members of Parliament with whom he had spoken were under the impression that these lists of preparations had something mandatory about them, and were not aware that a practitioner could justify his use of a "blacklisted" preparation if he needed it.

The Committee agreed to suggest some changes in the wording of the proposed preface, and to keep the matter on the agenda.

The CHAIRMAN mentioned the position of doctors on the Isle of Man. The Secretary of the Association and himself had gone over there to give evidence to a commission examining the income of public servants on the island. If the commission now sitting decided to lower the salaries of the doctors there because of the lower income tax obtaining, it might mean that the British Medical Guild would come to the Trustees of the N.I.D.T. for a proposal for the fullest support of the doctors in resisting such a project.

The Committee considered a letter from the Medical Insurance Agency, together with counsel's opinion, on the setting up of a pension scheme for medical and dental employees, and the manager of the Agency (Mr. Dixon) attended to explain certain points and to give examples of benefit at different salaries. The Committee considered the scheme to be satisfactory and recommended it to Council, but, of course, left to Council the decision as to appointment of trustees.

A subcommittee of ten, with a separate subcommittee for Scotland, was set up to bring forward suggestions in connexion with the evidence to be tendered to the Guillebaud Committee.

The Committee, which assembled at 10.30 a.m., concluded its business at 5.45 p.m.

The B.M.A. in Committee

AMENDING THE ACTS

A measure so revolutionary, and in some respects so unacceptable to the medical profession, which had to work it, as the National Health Service Act obviously presented many points at which, in the light even of a short experience, amendment was desirable, and some of these points in the view of the British Medical Association were fundamental.

A Standing Committee

Quite early the Council set up a committee whose task was to gather together various proposals for reform which could be presented to the Government when an Amending Bill came to be introduced. This, however, was not a policy-forming committee; it took as the basis of its work Association decisions already formulated. Then, in 1950, after the Act had been in operation for two years, the Representative Body, on the motion of Harrow, supported by Marylebone and other Divisions, resolved that the committee in charge of this amending work should have the status of a standing committee. Since then the Amending Acts Committee, as it is called, has done an amount of good solid work.

The Committee consists of six members appointed by the Representative Body and six by the Council. The chairmen of the General Medical Services Committee, the Central Consultants and Specialists Committee, and the Public Health Committee are members *ex officio*, as are the principal officers of the Association.

The Committee's Field

Amending Acts—in the plural. It is customary to speak only of the National Health Service Act, 1946, but there are also the National Health Service (Scotland) Act, 1947, the Health Services Act (Northern Ireland), 1948, and the National Health Service (Amendment) Act, 1949, all of which figure in the Committee's terms of reference. But these Acts are not all; the Committee is also bidden to consider any other amending or replacing Acts, and—a formidable task—all the regulations, directions, and orders made under these Acts.

Under its chairman, Dr. H. H. D. Sutherland, a London general practitioner, the Committee completed within a year its first report on the reform of the Service, and a special meeting of Council was called to examine it. A couple of months later, in December, 1951, a Special Representative Meeting was summoned for the same purpose. It is a testimony to the interpretative powers of the Committee that its long and detailed and fundamental recommendations should have been, with only slight modifications, cordially approved. Thus encouraged, the Committee turned to the second and perhaps more contentious part of its labours, armed with the instruction of the Representative Body to formulate a detailed programme of the reforms which the profession desired to see adopted.

Pattern for Improvement

The Committee, of course, did not begin its labours with a blank sheet of paper. Various committees of the Association had already been concerned with the operation of the Act in different fields of practice and the need for improvement as they saw it. The new Amending Acts Committee collected those views, moulded them into a pattern, and initiated new suggestions for consideration. From the start it was made clear that the Committee did not undertake its work in any spirit of antagonism to a National Health Service Act. Quite the contrary. Its purpose has been to make the Service one in which all sections of the profession can co-operate with the utmost good will. "Improvement," said Froude, "is from within outwards." A body of people who are actually working the Act themselves, and closely in

INVESTIGATION BY DARTFORD DIVISION

The Dartford Division of the B.M.A., concerned about the possible ill effects of cement-dust-laden atmosphere, sent questionnaires to 400 members in its own and other Divisions neighbouring Thames-side cement works. Doctors were asked if they were aware of any evidence of direct or indirect injury to health from heavy deposits of cement dust.

Ninety-four replies were received. Of these, 5% considered that the dust aggravated asthma. Indirect hazard to health, however, was mentioned in 40% of the replies, the mental and physical irritation caused by the dust being instanced. With few exceptions, opinion was that greater effort should be made to control the nuisance.

Ministry Report

The problem of dust emission from cement works in England and Wales is referred to in the annual report of the Chief Alkali Inspector of the Ministry of Housing and Local Government and the Chief Inspector for Scotland published recently (H.M.S.O., price 2s. 6d.). The failure of electrical precipitators for the de-dusting of kiln gases has been a matter for grave concern, but experience gained in the causes of failure should result in better operation. Progress in dealing with low-level dust emissions is reasonably satisfactory.

touch with the feeling of the entire profession, are well fitted to suggest the improvements which will make the Service a success.

The first recommendation put forward at the Special Representative Meeting was for the establishment of a National Health Service Court of Arbitration. This is still a matter of debate with the Government, and the strong views expressed on the subject at the Cardiff meeting will be fresh in the memory. Other recommendations were made for limiting the powers of the Minister, and for putting the hospital administrative service on a more democratic basis. The debate continues, but the Association, with the help of this Committee, has taken the initiative, and the work it has done and will do should shape the permanent National Health Service of the future.

Example from the Past

A parallel may perhaps be found in the earlier history of the Association as a reply to those who may think that when the time comes for an overhaul of the Act it will be dictated by the political circumstances of the moment. Five years after it was founded the Association set up a Medical Reform Committee to watch from the legislative point of view the interests of the profession at large, the reform of medical education, and the status of the practitioner. The committee drafted a Medical Bill, which was not passed into law, and after many negotiations and memorials and frustrations and defeats the Medical Act of 1858 (which set up the General Medical Council) was passed. That Act was in fact almost entirely the work of the Association. It was the first official recognition of the existence of the great body of medical practitioners and their importance to the State, but again it was only an instalment. The Committee was immediately reconstituted, this time as a Committee on Medical Legislation, and it began the Sisyphean task of modifying the Act of 1858. How trying to the patience are these efforts to amend legislation is shown by the fact that in the period of 11 years as many as 20 amending Bills were brought before Parliament, including three which were sponsored by the Government itself. Twenty-eight years had to pass before the Act of 1858 was amended by the Medical Act of 1886.

It may be hoped that the slow motion of the nineteenth century may not be projected into this age of speed, and that the Committee will not have to wait until the mid-seventies for the fruit of its labours.

REMOVED FROM N.H.S. LISTS

TWO TRIBUNAL CASES

The case of Dr. W. F. Cruickshank, of Brechin, was on June 15 brought before the Scottish National Health Service Tribunal on the complaint of the Angus County Executive Council. Dr. Cruickshank conducted his own case.

The findings of the Tribunal were that Dr. Cruickshank, who had been in practice in Brechin for many years and had been on the medical list of the Angus, Aberdeen, and Kincardine County Executive Councils since the beginning of the National Health Service, had not carried on his practice in person since about the end of March, 1953, but had had his patients looked after by various doctors acting as locumtenents. Before that date, during December, 1952, and January and February, 1953, he had often failed without reasonable cause to attend his surgery during consulting hours without any other intimation to his patients than "Doctor gone—No surgery" on a notice on the door or a similar statement by a member of his household. He made no arrangement on these occasions for his patients to be looked after by anyone else.

The Tribunal further found complaints of neglect of four individual patients were proved, though it was satisfied with Dr. Cruickshank's explanation regarding a fifth.

The instances of neglect found proved were that on December 31, 1952, Dr. Cruickshank was told that while he had been

out of the house there had been a telephone call and a personal message asking him to call on a woman patient because she was seriously ill. He neither went to see her nor tried to find out if she was better or had been seen by another doctor, and as a result another doctor had to attend her. A similar message two days later was similarly ignored.

In January, 1953, a patient whom Dr. Cruickshank had seen in the third and sixth months of pregnancy, whom he was to arrange to be confined at home, and whom he knew to be in her ninth month, had a fall. During the month she sent frequent messages to him to go to see her, but he did not tell her what arrangements had been made for her confinement nor did he visit her until after the baby was born on January 28.

On February 21, 1953, Dr. Cruickshank got a telephone message from a nurse who had been called in that a patient of his who was, as he knew, pregnant had had a haemorrhage at her home, and asking him to come and attend her. Both this message and a similar message later in the day he ignored. As a result another doctor was called in and had her x-rayed and admitted to hospital.

On December 26, 1952, Dr. Cruickshank was called to see a patient suffering from cancer who had been discharged from Dundee Royal Infirmary the day before and had to attend hospital daily as an out-patient until January 16, 1953. Both he and his wife repeatedly asked Dr. Cruickshank to come to see him during that time and later because he was in considerable pain, but he did not do so until early February, 1953. The patient subsequently died.

In all these instances the Tribunal found that there was no reasonable excuse for Dr. Cruickshank's behaviour. It regarded the case as serious, and the evidence as disclosing on the part of Dr. Cruickshank a gross neglect over a considerable period of his duties as a medical practitioner under the National Health Service and a wide disregard of the needs of his patients. It believed him to be a potentially capable doctor who, if he applied his mind wholeheartedly to his duties, could be a useful member of the medical profession, but it was satisfied that his continuance on the list was prejudicial to the efficiency of the Service. It accordingly directed his name to be removed, and ordered him to pay the costs incurred by the executive council before the Tribunal.

Alleged Irregular Dispensing

On April 14-15 the English National Health Service Tribunal heard at Carlisle a complaint by the Cumberland Executive Council against Dr. H. A. K. Rowland.

Dr. Rowland, aged 31, qualified in 1945, when he became a house-surgeon at the Radcliffe Infirmary, Oxford. From 1946 to December 21, 1948, he served as a medical officer in the Royal Air Force, attaining the rank of squadron leader. On December 22, 1948, he started practice at Workington in succession to two doctors whose premises there he had already bought, and his name was included in the Cumberland Executive Council lists. He never had any private patients.

In August, 1949, he informed the Cumberland Executive Council that he wanted to open a surgery for his patients in Distington and that he wished to dispense for them. At the request of the council he sent by his wife a list of 244 patients in Distington, and he elected to be paid for dispensing for them on the basis of the Drug Tariff rather than on the basis of a capitation fee. The council duly allowed him to do so.

The complaint against Dr. Rowland was that he had dispensed or submitted to the pricing bureau prescriptions for people who were on his list but for whom he had no authority to dispense, for people who were not on his list and could not be traced, for people who were dead at the date of the prescription, and for people whose names and addresses he had entered illegibly; that he had submitted for payment prescriptions and duplicates divided into more than one script instead of including the whole prescription on one script; that he had submitted for payment prescriptions which he had not actually dispensed; and that he had failed to maintain and render medical records as required by the regulations.

On the evidence before it the Tribunal could not avoid the conclusion that Dr. Rowland had either not dispensed

all the prescriptions he claimed to have dispensed or had prescribed and dispensed recklessly and with no regard to the needs of his patients or his duty as a medical practitioner under the Health Service. It was satisfied that he had deliberately sought to enrich himself improperly and that a large part of the money claimed and received by him had been deliberately claimed and received dishonestly with intent to defraud the council. It also found that he had failed to render at the proper time certain medical returns.

Being of the unanimous opinion that the continued inclusion of Dr. Rowland on the council's list would be prejudicial to the Service, the Tribunal directed the removal of his name, and that it should not be included on the list of any other council under the Act, and ordered him to pay the costs of the inquiry.

Correspondence

Quality in General Practice

SIR,—Sir Lionel Whitby's "pen picture of the ideal medical student" (*Journal*, August 29, p. 451) has received wide publicity in both the medical and the lay press. Perhaps it is not therefore irrelevant to examine the fate under the National Health Service of some of those who closely approach his requirements.

It will be remembered that he envisages one who is "cultured, broadly educated in the humanities, intelligent and intellectual, of transparent integrity, humane, and sympathetic, and above all one who will love his fellow men with [the *B.M.J.* has "and," but I feel this is probably a misprint] all their weaknesses, their joys, and their sorrows." Let me review briefly the careers of three men, who in my opinion and the opinions of others, when measured by this yardstick, can with truth be described as good examples of the type of person Sir Lionel would like to see in the medical profession.

No. 1 had a brilliant career in another faculty before proceeding to the M.B., which he completed at a British university, gaining first or second place in every major subject in the medical curriculum and graduating with honours. No one who knows him would hesitate to describe him as "cultured, intelligent, and intellectual," and I am sure his colleagues and associates would unanimously concede his "transparent integrity." In addition to "sympathy" I feel they would also allow him one quality which Sir Lionel did not mention, but, I venture to suggest, might have included—humility.

Qualifying early in the war, he was commissioned in H.M. Forces, in which he served for five years, and on his return to civilian life he quickly obtained the diploma of the M.R.C.P. (Lond.) at his first attempt. Though well liked and admired by his superiors, he is to-day a "supernumerary senior registrar," and since his appointment is not at one of the main teaching hospitals of the region his professional prognosis is admittedly poor. He has applied for consultant posts in his own and other regions, and, although he is easily the most able man of his specialty and grading known personally to me, he has been uniformly unsuccessful, failing in the great majority of cases even to reach the short-list. Turning his eyes to the alternative of general practice, he has discovered, as have many other senior registrars, that general practitioners do not care to appoint as assistants men with higher qualifications. Thirteen years after graduation he therefore earns about half the salary of the average general practitioner in Great Britain, but lacks his security.

No. 2 I met three years ago when he was a medical registrar. He held the medical degree of one or other (I forget which) of what I believe are known as "the older universities." He also held the M.R.C.P. (Lond.) and had served during the war with H.M. Forces. Broadly educated in the humanities, he possessed sufficient intelligence and intellect to gain a competitive entrance scholarship to his university. Like No. 1, he was both sympathetic and modest, but his appointment was not to a teaching hospital, and, realizing that his prospects in consultant medicine were flimsy, he completed six months as a house-surgeon in a maternity hospital, having already spent six months in a surgical unit, in the hope that he might obtain a post as an assistant in general practice. My last information concerning him was to the effect that he had attained just that.

No. 3 was yet another ex-Serviceman and the holder of the F.R.C.S. (Eng.). I cannot accurately assess the extent of his "education in the humanities," but he was well above the medical average in intelligence and a competent and kindly practitioner of his art. He also held an appointment in a non-teaching hospital, and, realizing the hopelessness of his chances of attaining specialist status, made unsuccessful attempts to enter general practice in a congenial area. A few months ago I learned that he had permanently abandoned the practice of medicine.

If medical students are drawn from "the upper one-third stratum of the normal distribution of intelligence," senior registrars may be said to be drawn from not the least intelligent of medical practitioners in general. Moreover, their "love of their profession" is well attested by their refusal to enter the relatively lucrative field of general practice immediately after the war when vacancies were numerous, preferring to accept ill-paid resident posts in hospital at considerable material sacrifice to themselves, their wives, and families, so that they might become more proficient in a selected field of medical practice.

To-day those labelled "supernumerary" are the inarticulate expendables of the National Health Service. They are the holders of blind-alley jobs from which promotion to higher rank has a rarity that is proverbial. Their attempts to enter general practice are ludicrously pathetic. Not only will few executive councils seriously consider their applications, but "assistantships with view" are almost closed to them unless providence in the shape of a relative or friend lends them the necessary help. Even applications for ordinary assistantships are in the overwhelming majority of cases unsuccessful.

When I was a medical student a senior member of the staff was wont to urge us not to enter general practice too hastily after qualification. He advocated a rotation of hospital resident posts so that one might, as he put it, "learn sound methods which would last one a lifetime." He may have been right, but one thing is clear. Tenure of a rotation of hospital posts will make no impression upon the average executive council, nor will higher qualifications, education in the humanities, culture, intelligence, or intellect. Short-lists are sometimes drawn up without even the assistance of a referee's opinion of the candidate. What is really important is something not taught in medical schools. It is surrounded by an aura of mystery and is shortly to have its own temple and high priests. It is called "general practice" and is apparently something for which the holders of higher qualifications are deemed to be inherently incapacitated.

It was a layman in a medical bureau who told an applicant for a general practice vacancy that possession of a car was more important than possession of an M.R.C.O.G., which he told him significantly would do him more harm than an F.R.C.S., but (consolation!) not so much harm as an M.R.C.P.

Some of us are less alarmed at the admitted need for intellect, intelligence, and broader education among medical students than the overwhelming need for a sense of ordinary justice and decency among certain of our medical colleagues.

—I am, etc.,

Dunfermline.

R. G. WHITELAW.

Sweated Doctors

SIR,—To the letter from Dr. F. L. P. Heber (*Supplement*, September 12, p. 99) I feel that I must voice a reply. In my young days I did three house appointments without any remuneration beyond being boarded and fed free of charge. We worked longer hours and quite as hard as the present house-officers. I do not remember any serious complaints, and many of us went out of our way to do extra work to gain experience. Those who did the latter benefited in after-life indirectly.

The present house-officers are conspicuous by their lack of enthusiasm to do anything outside their contract. This may be the result of the pay which they get, which I think is very high for their ability when first qualified. It has fallen to my lot to select house-officers for many years now.

A few are good, but many are full of theoretical knowledge with little ability to apply this. The recent alteration to the laws has recognized some of this point of view by the pre-registration period.

It seems clear to me from observation that at the end of one year from qualifying the doctor will be really fit to earn a living salary, but before this he should realize that he is only a postgraduate student. It is deplorable to me that any house-officer should start comparing his salary with other hospital employees.—I am, etc.,

Harrow

HAROLD E. THORN.

Justice for the Sassenach

SIR.—It is high time a campaign was launched to allow doctors practising south of the Border some of the privileges granted to doctors in Scotland, in particular the use of Form E.C.10A.

There seems little to justify this unfair treatment of the southerner, which almost amounts to racial discrimination. One can only assume that our legislators were influenced by the never-ending flood of stories of Scottish providence emanating from north of the Tweed.

It would be a gracious act, and one calculated to improve relations between the two countries, if a Minister of Health bearing the name of Macleod would remedy this particular injustice.—I am, etc.,

Calne, Wilts.

ALASTAIR KER JAMES.

Association Notices

SIR CHARLES HASTINGS CLINICAL PRIZE ESSAY COMPETITION

The Sir Charles Hastings Clinical Prize Essay Competition was established by the Association for the Promotion of systematic observation, research, and record in general practice. The Competition has been extended by the addition of a second prize, known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

- (1) The Sir Charles Hastings Clinical Prize, consisting of a certificate and 50 guineas, will be awarded for the best essay submitted.
- (2) The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and 40 guineas, will be awarded for the second best essay submitted.
- (3) Any member of the Association who is engaged in general practice is eligible to compete for these Prizes.
- (4) The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions. It is suggested that essays should consist of from 3,000 to 10,000 words.
- (5) Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1953.
- (6) A prizewinner in any year is eligible for an award of either of the prizes in any subsequent year. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work.
- (7) If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay the decision of the Council on any such point shall be final.
- (8) Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.
- (9) Each essay, which should be unsigned, must be typewritten or printed and accompanied by a note of the candidate's name and address.
- (10) Inquiries relative to the prizes should be addressed to the Secretary.

Diary of Central Meetings

OCTOBER

- 1 Thurs. Central Consultants and Specialists Committee, 12.30 p.m.
- 2 Fri. Alcohol and Road Accidents Committee, 10.30 a.m.
- 2 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 11 a.m.
- 2 Fri. Registrars Group Council, 2 p.m.
- 6 Tues. Organization Committee, 2 p.m.
- 7 Wed. Committee on the Rehabilitation of Disabled Persons, 10.15 a.m.
- 7 Wed. Private Practice Committee, 11.30 a.m.
- 8 Thurs. Amending Acts Committee, 2 p.m.
- 8 Thurs. Scientific Exhibition Subcommittee, Arrangements Committee (Glasgow, 1954), 8.30 p.m. (at B.M.A. Regional Office, 234, St. Vincent Street, Glasgow).
- 9 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
- 9 Fri. Ophthalmic Group Committee, 2 p.m.
- 13 Tues. Central Ethical Committee, 2 p.m.
- 13 Tues. Joint Formulary Committee, 2 p.m.
- 14 Wed. Journal Committee, 10.30 a.m.
- 14 Wed. Public Relations Committee, 2 p.m.
- 14 Wed. Staff Side, Committee "C", 2 p.m.
- 14 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
- 14 Wed. Arbitration Machinery Committee, 4 p.m.
- 15 Thurs. Dermatologists Group Committee, 2 p.m.

Branch and Division Meetings to be Held

- BRADFORD DIVISION.**—At Royal Infirmary, Bradford, Wednesday, October 7, 8.15 p.m., meeting. Inaugural address by Dr. A. Bigham: "The Early Days."
- COVENTRY DIVISION.**—At Chace Hotel, London Road, Willenhall, Tuesday, October 6, 7.30 for 8 p.m., dinner; first ordinary general meeting. Inaugural address by Dr. J. F. Galpine: "Poliomyelitis, 1953."
- DARTFORD DIVISION.**—At Livingstone Hospital, Dartford, Thursday, October 8, 8.45 p.m., meeting. Lecture by Dr. A. E. Jones: "Radioactive Isotopes in Medical Treatment." To be illustrated by lantern slides.
- DONCASTER DIVISION.**—At Parkinson's Café, High Street, Doncaster, Tuesday, October 6, 7.30 p.m., joint meeting with Doncaster Medical Society. Address by Mr. W. McC. Scott: "Bladder-neck Obstruction."
- EAST HERTS DIVISION.**—At Hertford County Hospital, Thursday, October 8, 8.30 p.m., meeting. Films.
- EAST KENT DIVISION.**—At Chez Laurie Restaurant, Thaxted Way, Herne Bay, Thursday, October 8, 7.30 p.m., dinner; 8.45 p.m., Dr. G. B. Forbes: "Diseases Transmissible from Household Pets to Man."
- KENSINGTON AND HAMMERSMITH DIVISION.**—At Hammersmith Hospital, Ducane Road, W., Wednesday, October 7, 2 p.m., ward visit for general practitioners.
- LAMBETH AND SOUTHWARK DIVISION.**—At Lambeth Hospital, Brook Drive, S.E., Sunday, October 4, 11 a.m., clinical meeting.
- MIDLAND BRANCH.**—At 154, Great Charles Street, Birmingham, Thursday, October 8, 2.30 p.m., meeting.
- NUNEATON AND TAMWORTH DIVISION.**—At Red Lion Hotel, Atherstone, Tuesday, October 6, 8 p.m., supper; 8.45 p.m., meeting.
- ST. PANCRAZ DIVISION.**—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, October 6, 8.30 p.m., meeting. Lecture and demonstration by Dr. Alan Stoddard: "Osteopathic Technique."
- SCARBOROUGH DIVISION.**—At Scarborough Hospital, Thursday, October 8, 8.30 p.m., meeting. Dr. J. D. Dow: "The Evaluation of Radiological Findings in the Alimentary Tract."
- SCUNTHORPE DIVISION.**—At Scunthorpe and District War Memorial Hospital, Friday, October 9, 8.30 p.m., meeting. Address by Dr. F. S. Cooksey: "The Social Adjustment of the Physically Handicapped." Illustrated by photographs of gadgets, kitchen adaptations, etc.
- SOUTH ESSEX DIVISION.**—At Oldchurch Hospital, Romford, Friday, October 9, 9 p.m., clinical meeting.
- TOWER HAMLETS DIVISION.**—At Poplar Hospital, East India Dock Road, E., Friday, October 2, 8 p.m., meeting. Dr. D. Morris: "Some Recent Advances in Paediatrics."
- TUNBRIDGE WELLS DIVISION.**—At Kent and Sussex Hospital, Tunbridge Wells, refresher course. Saturday, October 10, 2.30 p.m., Mr. A. C. H. Bell: "Care of the Pregnant Woman"; 4.30 p.m., Mr. J. H. Peel: "Unexpected Difficulties in Labour"; 9 p.m., "Brains Trust." Sunday, October 11, 10 a.m., Mr. A. J. Wrigley: "The Care of Mother and Child"; 11.15 a.m., Mr. D. H. Macleod: "Common Gynaecological Complaints, Their Diagnosis and Treatment."
- WEST BROMWICH AND SMETHWICK DIVISION.**—At Recreation Hall, Hallam Hospital, West Bromwich, Tuesday, October 6, 8.30 p.m., meeting. Lecture by Dr. H. W. Everley Jones: "Some Recent Paediatric Developments."
- WOOLWICH DIVISION.**—At St. Nicholas' Hospital, Plumstead, S.E., Tuesday, October 6, 8 p.m., meeting. Members of the Greenwich and Deptford Division are welcomed.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

FIRST MEETING OF NEW SESSION

The first meeting of the new session of the Central Consultants and Specialists Committee was held at B.M.A. House, London, on October 1. Dr. T. ROWLAND HILL and Mr. T. HOLMES SELLORS were re-elected Chairman and Deputy Chairman respectively.

The death was announced of Mr. V. H. Ellis, who had been a member of the Committee since its formation, and the members stood in silence as a token of respect. Mr. C. E. Kindersley and Mr. H. J. McCurich were co-opted to the Committee.

The CHAIRMAN said that Dr. E. E. Claxton, Assistant Secretary, had given up the secretaryship of the Committee. He paid a high tribute, which was endorsed by all the members, to Dr. Claxton's services. His work in helping to build up the organization had been invaluable. The Chairman welcomed in his place Dr. S. J. Hadfield, Assistant Secretary, and complimented him on his recent survey and report on general practice.

The Committee proceeded to appoint its representatives on the Joint Consultants Committee. The following were appointed: Dr. T. Rowland Hill, Mr. T. Holmes Sellors, Mr. H. H. Langston, Mr. D. W. C. Northfield, and Mr. S. F. R. Whittaker, together with one Scottish member to be nominated later. These six became automatically members of the Executive, and as a result of a ballot the following further members were appointed to the Executive: Mr. A. Lawrence Abel, Professor S. J. Hartfall, Mr. J. R. Dr. P. W. Edwards, Professor G. I. Strachan.

The Committee endorsed the reappointment of its sub-committees concerned with junior hospital staff, public and professional relations, and organization. Mr. B. N. Brooke, Dr. R. D. Lawrence, and Professor Strachan, together with a Scottish representative, were appointed representatives on a subcommittee set up by the General Medical Services Committee to carry out an inquiry into the number of students admitted to medical schools in relation to the probable future need for doctors. Dr. D. F. Hutchinson, on behalf of the General Medical Services Committee, said that it was intended that the subcommittee should cover every possible aspect of the situation.

It was decided, in view of the pressure of business, that the Committee should hold all-day meetings in future, beginning at 10.30 in the forenoon.

Senior Registrars

The CHAIRMAN, in reporting on the work of the Joint Committee, said that the view had again been placed before the Ministry that many senior registrars were engaged in the work of a consultant nature, and that, unless additional consultant posts were created, an acute staffing problem would arise when the transitional posts recently approved by the Ministry came to an end in two years' time. The

Committee had therefore suggested that hospital boards should be advised of the necessity of reviewing their staffing arrangements before there was any further reduction in senior registrar posts. The Ministry had replied that there was no need for special action, as the boards would do this as a matter of course.

Mr. H. H. LANGSTON suggested that the Committee might be in a position to help in this respect by pointing out to the Ministry exactly where additional posts were necessary. The information could be collected from the regions, and the need for increasing the establishment in a particular region and in a particular branch of medicine could be pointed out.

A representative of the registrars mentioned one specialty—namely, serology—in which the number of consultants' posts was very small indeed, and the whole pattern of registrar appointments needed examination. The CHAIRMAN promised that all these considerations would be brought before the Joint Committee.

On the question of the medical staffing of casualty departments in the light of the increasing risk of litigation affecting hospital officers, it was stated that the Joint Committee did not oppose the suggested appointment of senior casualty officers with a tenure of up to four years at a salary within the S.H.M.O. range, but would be guided by the work of the subcommittee which had just been set up to study junior staffing problems.

Whole-time and Part-time Service

Some figures were laid before the Committee concerning the number of whole-time and part-time consultants. At the end of last year the number of whole-time consultants was 1,780 and of part-time 4,467. These figures compared with 1,310 and 3,879 respectively at the end of 1949. The percentage of consultants who were whole-time had risen during the last four years from 25.2 to 28.5, the chief increase being in the ancillary departments.

Reference was made in the discussion to the difficulty of the whole-timer becoming a part-timer.

It was stated that the Ministry had again been urged to advise the boards, wherever practicable, to offer candidates for consultant appointments an option for whole-time or part-time service, and that, where such an option was offered, candidates should not be asked for their preference at the time of the interview, as this might appear to be prejudicial to those who had expressed a preference for part-time service.

Domiciliary Consultations

A question arose concerning the statement giving the diagnosis on the domiciliary consultation certificate. There were instances, it was stated, where this information had been abused. The Ministry, while agreeing to look into the matter, had stated that its impression was that the diagnosis was of considerable value to the boards for the purpose of regional planning, and it required further evidence before the certificate was judged to be undesirable.

Mr. STAVELEY GOUGH pointed out that a precise diagnosis on the certificate was not essential. No information which it was undesirable to give need be given.

Mr. LANGSTON said that in his region the strongest objection was taken to putting down the diagnosis, both by consultants and, even more strongly, by general practitioners. It was not regarded as a minor point at all. There had been cases where the forms had been sent back for more exact diagnosis.

Reports to General Practitioners on Discharge of Hospital Patients

Dr. J. D. R. MURRAY, representing the General Medical Services Committee, brought forward the question of reports from hospitals to general practitioners. The Representative Body had urged that hospitals should be instructed that on the day of discharge of a patient a preliminary note concerning diagnosis and treatment should be sent to the patient's doctor, to be followed later by a complete report. The Central Consultants and Specialists Committee, however, had expressed the view that any action on these lines was unnecessary in view of existing instructions, but this was a view the General Medical Services Committee could not accept. In its opinion the Ministry should be asked to impose an obligation upon junior hospital medical staff to issue a report to the general practitioner on the day of discharge or death. Dr. Murray said that there was ample evidence from all over the country of the great difficulty which was being experienced at the present time by general practitioners in getting information about their patients.

In discussion a member suggested that a representative from the local medical committee should have a seat on the medical advisory committee with a view to working out a satisfactory local arrangement. Mr. LANGSTON said that they were well aware that there had been lapses, but he objected to the Ministry being asked to give a directive to hospital medical staffs. Other members said that the trouble was solely due to the shortage of clerical staff. Mr. J. R. NICHOLSON-LAILEY suggested that regional committees should be asked to consider the matter and determine whether local arrangements were satisfactory. Mr. STAVELEY GOUGH said that there was no disagreement on the principle of early notification, but clerical assistance was not always available.

The CHAIRMAN said that he felt that general practitioners, very much aware of their own difficulties, sometimes failed to comprehend the difficulties of hospital medical staffs. The pressure both on consultants and on house officers was very great—infinitely greater than it had been in the past. To increase the difficulties of the doctor in hospital was not the right way to meet the situation. He agreed that the general practitioner must be helped in every way possible by early notification on discharge, but he was not in sympathy with the idea that hospitals should be directed on the subject. He was sure that general practitioners, for their part, would not take kindly to directives given to them by the Ministry of Health. The Committee was sympathetic and would do all in its power to meet the difficulty in a spirit of understanding.

The Guillebaud Committee

The Committee considered a memorandum of guidance to the standing committees of the Association which were invited to prepare evidence for submission to the Guillebaud Committee. A steering committee had been set up under the chairmanship of the Chairman of Council, with the chairmen of the main committees as members, among them the Chairman of the Central Consultants and Specialists Committee. It was agreed to authorize the executive to go into this matter as one of urgency and to report to the next meeting. The Chairman commented on the extremely wide terms of reference of the Guillebaud Committee.

Legal Actions Involving Hospital Staff

A request from the Council to consider the desirability, in view of the increasing litigiousness of the public so far

as doctors were concerned, of establishing a panel of experienced consultants who would be prepared to give their time to the assistance of their younger colleagues in such matters as threatened actions for alleged negligence, was before the Committee.

Dr. S. COCHRANE SHANKS pointed out that in the medical defence and protection societies they had a distinguished group of medical men—consultants, general practitioners, and public health officers—who were well versed in the handling of medico-legal problems, and each of these societies had a medical secretariat of wide experience. These were by far the best people to handle the situation.

Other members expressed themselves to the same effect, and the Committee appeared to be in general agreement.

The Committee proceeded to discuss some twenty other resolutions of the Representative Body, and decided on the appropriate further action in each case. Among the resolutions of the Representative Body which were endorsed by the Committee was one urging that, when dependants of Service personnel who are on hospital waiting-lists remove from one area to another, the length of time that the patient has already been on a waiting-list should be taken into account at the new hospital.

Proposals from the Treasury concerning fees for part-time employment in Government departments were laid before the Committee and referred to the Executive for detailed study and report.

CERTIFICATION

GENERAL PRACTITIONERS' INCREASING DIFFICULTIES

The following announcement has been sent by the B.M.A. to local medical committees:

From time to time isolated instances have arisen where the accuracy of medical certificates given by general practitioners has been called to question, and indeed the validity of the certificates themselves challenged by regional medical officers of the Ministry of Health.

The General Medical Services Committee is in no doubt about the high standards which the vast majority of general practitioners have set themselves in issuing certificates, nor does it dispute the necessity for the Ministry to have a check upon the disbursement of public money, but undoubtedly the increased call for certificates resulting from the National Insurance scheme and the increasing tendency of employers to demand certificates for even short periods of absence has increased the difficulties of general practitioners in this respect.

The Committee feels, therefore, that this is an appropriate occasion upon which to draw the attention of general practitioners to the need for taking the greatest possible care in issuing medical certificates.

First, every general practitioner must conform to certain well-defined ethical obligations when issuing medical certificates, and indeed, in the words of the warning notice issued by the General Medical Council, a certificate must not be untrue, misleading, or improper. In addition, however, lax certification may well lead to investigations by regional medical officers, and the general practitioner is expected to observe certain rules for the issue of certificates which are required for National Insurance purposes. These rules require primarily that every certificate must be in writing in ink or other indelible substance and contain the following particulars:

- (a) the claimant's name;
- (b) the date of the examination on which the certificate is based;
- (c) a concise statement of the disease or disablement by which the claimant is, in the practitioner's opinion, at the time rendered incapable of work;
- (d) the date on which the certificate is given;
- (e) the address of the practitioner.

They also lay down that the certificate shall specify the cause of incapacity as precisely as possible, and that every

certificate must be given on a date not more than a day later than the examination upon which it is based.

It is, in the Committee's view, of the greatest importance that the public should have a proper respect for the value of certificates which are issued by general practitioners, and it is hoped that local medical committees will, in their areas, from time to time draw the attention of practitioners to their statutory and ethical obligations in this matter, and take up on their behalf any cases where it would appear that unreasonable demands have been made.

PRACTICE PREMISES

CALL FOR HIGHEST POSSIBLE STANDARDS

The following letter from the Chairman of the General Medical Services Committee has been sent to every general practitioner in the National Health Service:

When the Minister of Health addressed the Annual Conference of Local Medical Committees in June this year, he paid tribute to the unique position of the general practitioner as the leader of the clinical team in the health field.

The General Medical Services Committee has expressed considerable satisfaction at this public recognition of the general practitioner's work, and it feels that everything possible should be done to maintain and enhance the status of this section of the profession.

One important factor which in the mind of the public reflects directly on the status of the individual doctor is his surgery and waiting-room accommodation, and, although in spite of post-war difficulties the general standard is of a high order, a number of general practitioners have, by reason of building restrictions and the high cost of repairs and maintenance, been prevented from doing all that they would have wished in this respect.

Under his terms of service a practitioner at his own expense "is required to provide proper and sufficient surgery and waiting-room accommodation for his patients having regard to the circumstances of his practice." Any member or officer of the executive council or the local medical committee can, under the regulations, be authorized to inspect the accommodation provided and to report upon it.

It is clear from recent questions and answers in Parliament that attention is likely to be focused upon isolated cases where the standard of accommodation falls short of what is desirable, and the General Medical Services Committee is anxious to forestall any criticism which might arise.

A doctor's remuneration in the National Health Service takes into account his obligation to provide suitable premises, and it remains his personal responsibility to provide them at his own expense.

For a number of reasons the Committee now feels that it should invite individual doctors to review the surgery and waiting-room accommodation in their practices.

First, there has been some general relaxation in building restrictions. No licence is now required for building work up to £500, and all development charges under the Town and Country Planning Act have been abolished.

Secondly, the widespread establishment of health centres no longer seems likely, at any rate for some considerable time to come.

Thirdly, as a result of the Danckwerts award, general practitioners may now feel themselves to be in a better position to embark upon expenditure of this nature.

Fourthly, the practice expenses ratio established by the Danckwerts award includes a substantial element in respect of the cost of maintaining surgery premises. In this way the amounts allowed as legitimate practice expenses by the Inland Revenue authorities by way of depreciation, repairs, and renewals, etc., are reflected in the net amount of the Central Pool. Thus a practitioner who continues to maintain practice premises of a substantially lower standard than that of his colleagues derives an unfair financial advantage.

The Committee is convinced that it would be neither practicable nor desirable to attempt to lay down any minimum standards, since conditions of practice must vary widely in different parts of the country. It believes that any necessary improvements in the standard of accommodation provided should develop spontaneously from a wish by the individual doctors concerned to ensure that their practice premises are compatible with the prestige and status of general practice in the Service, and as such will enable them to give of their best to their patients.

This is the concern of all doctors wherever they practise, whether in partnership or alone. It is separate from, and should not be confused with, certain arrangements now under discussion which are intended, in approved cases, to encourage group practices.

The Committee earnestly hopes that every general practitioner will do his utmost to provide the highest possible standard of surgery and waiting-room accommodation for his patients. Local medical committees, local executive councils, and local housing authorities are always ready to offer advice and guidance in any way possible, and, in any particularly difficult cases where the aid of the Ministry or the Department of Health for Scotland would be useful, the Committee has been assured that it will be readily forthcoming.

Correspondence

General Practice

SIR,—Dr. Stephen J. Hadfield is to be congratulated on his fine service to the purposes for which he undertook "A Field Survey of General Practice, 1951-2" (*Journal*, September 26, p. 683). Yet most general practitioners who read his remarkable document will surely feel that, whatever purposes inspired him, Dr. Hadfield has, like the compiler of Domesday Book, painted a lively and penetrating picture from the life of his time. In years to come those for whom history is not merely photographic or statistical will here light upon a composite drawing of medical life in the early days of the National Health Service—a composition which for all its wealth of picturesque detail never for a moment creates any doubt as to its author's sincere devotion to fact-finding research.

No ordinary professional contacts can give such insight or afford the general practitioner this wonderful view of himself and his colleagues. In assembling a wealth of character and circumstance under appropriate headings Dr. Hadfield is all the time introducing us to individual doctors. One may not exactly recognize oneself amongst these, and yet may marvel at how much one has in common with the lot. For as you travel round with Dr. Hadfield he inevitably fits you into his picture.—I am, etc.,

Eye, Suffolk.

J. SHACKLETON BAILEY.

SIR,—Your "General Practice" number (September 26) contains comprehensive, if restrained, comments on the whole field of G.P. work and provides material for many long letters, some of which you will no doubt receive. Meanwhile, may one be permitted three comments?

First, Dr. Stephen J. Hadfield, in his admirable article (p. 683), suggests that 92% of general practitioners are "adequate or better than adequate." Faint praise. The tone of his article suggests to me that his standard of adequacy could justifiably be set rather higher. When one remembers that the doctors interviewed knew they were the subject of a critical survey, and therefore likely to be on their best behaviour, his figure of 92% becomes a trifle optimistic.

Secondly, practice is exactly what the doctor makes of it, and patients behave just as their family doctor has trained them to. The man whose patients come to him only for a letter to hospital is only reaping the lack of trust engendered by years of poor medicines, for patients naturally

rely on their doctor, while he who refuses to do minor surgery, etc., unless he is paid for every stroke has only himself to blame if practice becomes a wearisome unvarying grind.

Finally, the phrase "lack of time" recurs again and again to explain the G.P.s' failure to attend postgraduate classes, keep records, co-operate with each other, etc. Surely this is not an acceptable excuse. It must be realized that to take advantage of recent advances more time must be given to each patient even than 10 years ago. Of all members of the profession the general practitioner is best able to adjust the amount of work he does to a reasonable level. There is no need for any G.P. to be overworked, least of all for financial reasons. I believe that the desire to keep on increasing income accounts for many of the evils of practice to-day, and is entirely responsible for the difficulty in entering general practice.—I am, etc.,

Petts Wood, Kent.

H. P. HILDITCH.

SIR,—Presumably Dr. Stephen J. Hadfield's "Field Survey" (*Journal*, September 26, p. 683) and the postal inquiry (*Supplement*, September 26, p. 105) were meant to give a picture of general practice in Britain to-day. If so, the picture is incomplete. Why was no attempt made to find out what the all-too-many assistants think of the Health Service?

No one asked them about their fears or frustrations, their anxieties or their hopes for the future. Dr. Hadfield must surely have met them in his travels, even though it may have been in the presence of their principals; in such a situation they might, wisely, have had little to say, for assistantships are not easy to come by these days, even in the Welsh mining valleys or industrial Lanarkshire.

I suggest that a postal inquiry among assistants might reveal the seamier side of practice in this country. It could start by asking how many jobs the assistant has had since he began in practice, and how many assistants had had his job before him. From there it could easily lead on to broken promises about partnerships and such minor abuses. Assistants would not like to see their names in print, but by post they could remain anonymous. There should be no difficulty in getting in touch with them, as every executive council holds a list of their names. I am sure their answers to a properly chosen set of questions would alter some of the conclusions reached in your issue of September 26.—I am, etc.,

Wellington, Salop.

W. J. REILLY.

Association Notices

Diary of Central Meetings

OCTOBER	
13 Tues.	Central Ethical Committee, 2 p.m.
13 Tues.	Joint Formulary Committee, 2 p.m.
14 Wed.	Journal Committee, 10.30 a.m.
14 Wed.	Public Relations Committee, 2 p.m.
14 Wed.	Staff Side, Committee "C," 2 p.m.
14 Wed.	Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
14 Wed.	Arbitration Machinery Committee, 4 p.m.
15 Thurs.	G.M.S. Committee, 10.30 a.m.
15 Thurs.	Dermatologists Group Committee, 11.30 a.m.
(Time changed from 2 p.m.)	
16 Fri.	Charities Committee, 11.30 a.m.
16 Fri.	Overseas Committee, 2 p.m.
16 Fri.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
19 Mon.	Armed Forces Committee, 2 p.m.
20 Tues.	Industrial Injuries Evidence Subcommittee, Occupational Health Committee, 2 p.m.
22 Thurs.	Full-time Non-professional Medical Teachers and Research Workers Group Committee, 2 p.m.
22 Thurs.	International Relations Committee, 2 p.m.
23 Fri.	Library Subcommittee, Science Committee, 11.30 a.m. (postponed from September 25).
23 Fri.	Science Committee, 2 p.m. (postponed from September 25).
27 Tues.	Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Aldershot Civil Infectious Diseases Hospital, Redan Road, Aldershot, Tuesday, October 13, 8.30 p.m., annual general meeting.

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Blackpool, Wednesday, October 14, 7.15 p.m., dinner; 8.30 p.m., Mr. W. Lamont: "The Arthritic Knee Joint."

CITY DIVISION.—At Woodberry Down Health Centre, Green Lane, N., Tuesday, October 13, 7.30 p.m., Centre open for inspection; 8.30 p.m., meeting.

CROYDON DIVISION.—At 43, Wellesley Road, West Croydon, Tuesday, October 13, 8.30 p.m., general meeting. Address by Mr. A. M. Macarthur: "A Review of Cardiac Surgery."

DEWSBURY DIVISION.—At General Infirmary, Dewsbury, Friday, October 16, 8.30 p.m., meeting. Dr. W. Yeoman: "The Home Treatment of the Rheumatic Patient."

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, October 15, 8.30 p.m., meeting. Dr. W. J. O'Donovan: "Drug Eruptions New and Old."

HAMPSTEAD DIVISION.—At Hampstead General and North-West London Hospital, Haverstock Hill, N.W., Wednesday, October 14, 8.30 p.m., meeting. Mr. J. C. R. Hindenach: "The Orthopaedic Disabilities of the Lower Limb in Childhood."

HASTINGS DIVISION.—At Royal East Sussex Hospital, Tuesday, October 13, 8.15 p.m., meeting. Address by Dr. W. E. Davidson: "Origin, Progress, and Future of General Practice."

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, October 13, 8.45 p.m., meeting. Sir Gordon Gordon-Taylor: "In Retrospect." Illustrated by lantern slides.

KENSINGTON AND HAMMERSMITH DIVISION.—At Hammersmith Hospital, Duane Road, W., Wednesday, October 14, 2 p.m., ward visit for general practitioners.

KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital, Wolverson Avenue, Kingston-on-Thames, Tuesday, October 13, 8 for 8.30 p.m., meeting. Dr. Robert Forbes: "Recent Developments in Medical Litigation."

NORTH OF ENGLAND BRANCH.—At New Lecture Theatre, Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, October 15, scientific meeting—7.15 p.m., Clinical demonstration by Mr. F. Denis Hindmarsh: "Problems of Varicose Ulceration"; 8.45 p.m., address by Dr. R. Bodley Scott: "Enlargement of the Lymph Nodes."

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, October 13, 8.30 p.m., local conference on tuberculosis. All members of the Liaison Subcommittee are invited.

NORTH-WEST WALES DIVISION.—At Royal Hotel, Capel Cerrig, North Wales, Saturday, October 17, 7.30 for 8 p.m., informal dinner followed by two films: (1) Senile Obliterative Arteritis of the Legs; (2) Management of Normal Labour.

ROCHDALE DIVISION.—At Kingsway Hotel, Rochdale, Monday, October 12, 8.30 p.m., meeting. Dr. Basil Wolman: "Problems of the Newborn."

SOUTH MIDDLESEX DIVISION.—At Red Lion Hotel, Hounslow, Wednesday, October 14, 7.30 for 8 p.m. Informal supper with pharmacists, followed by a discussion to be opened by Mr. Harold Moss, president of the Thames Valley Pharmaceutical Association.

SOUTH-WEST ESSEX DIVISION.—At Connaught Hospital, Orford Road, Walthamstow, E., Tuesday, October 13, 8.30 p.m., meeting. B.M.A. lecture by Mr. J. Bentley: "Recent Advances in Vascular Surgery."

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, October 16, 8 p.m., meeting. Address by Dr. Robert Forbes: "Medical Litigation."

SWANSEA DIVISION.—At Morriston Hospital, Swansea, Thursday, October 15, clinical meeting.

WANDSWORTH DIVISION.—At St. James' Hospital, Balham, Wednesday, October 14, 8 p.m. Cocktail party.

WEST HERTS DIVISION.—At The Avenue Clinic, Watford, Tuesday, Wednesday, and Thursday, October 13, 14, and 15, 4.30 to 5.30 p.m., periods for general practitioners to meet health visitors in area.

Meetings of Branches and Divisions

NORTH STAFFS DIVISION

The North Staffordshire Division celebrated its Golden Jubilee on September 24. A most successful and well-attended B.M.A. lecture was given by Mr. T. Holmes Sellors entitled "The Diagnosis and Treatment of Cancer of the Lung."

In the evening a Jubilee Dinner took place at the North Stafford Hotel. It was attended by 147 members and friends. The toast of the B.M.A. was proposed by Mr. P. T. Bowcock, president of the North Staffordshire Law Society, and responded to by Mr. J. W. Tudor Thomas, President of the B.M.A. The health of the Division was proposed by Dr. S. Wand, Chairman of the Representative Body, and the response was from Dr. Peter Edwards, chairman of the North Staffordshire Division. The toast of the guests was proposed by Dr. H. J. Browne, vice-chairman of the North Staffordshire Division, and Dr. A. B. Davies responded. Dr. A. Macrae, Secretary of the B.M.A., and Dr. E. E. Claxton, Assistant Secretary, also spoke on behalf of the guests.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 17 1953

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GRADING OF S.H.M.O.s MINISTRY REFUSES TO ALLOW FURTHER REVIEW OF CASES

At the Annual Representative Meeting in July, 1952, considerable disquiet was expressed about alleged injustices following the review of S.H.M.O.s which had taken place some months earlier, and a plea was put forward that there should be a right of appeal to some central body against decisions of the review committees. As a right of appeal had previously been refused by the Government the Central Consultants and Specialists Committee did not feel that any useful purpose would be served by pursuing the matter, but the Committee gave an undertaking that it would raise individual cases of apparent injustice with the Ministry.

The Committee subsequently examined the claims of those S.H.M.O.s who had expressed dissatisfaction with their grading, and sought advice from independent sources. As a result the Committee was satisfied that there was prima facie evidence for suggesting that in certain cases injustice had been done, and these cases were brought to the notice of the Ministry. The Ministry replied that the status of all of the doctors originally graded as S.H.M.O.s had been thoroughly reviewed on more than one occasion, and that it was clearly understood that the review at the end of 1951—the machinery for which had been agreed with the Joint Committee—would be the final approach to the problem. The Ministry stated that it was always ready to satisfy itself that in any particular case the proper arrangements had been made for the review of grading, and it had ascertained that in each case to which its attention had been directed the fullest consideration had been given by a committee which was expert, locally informed, and constituted in the agreed manner. The Ministry thought that no central appeal committee could enjoy all these advantages, and it saw no reason, therefore, for reopening the question.

The matter was thereupon taken up by the Joint Committee, which informed the Ministry that, while it did not doubt that the review committees had been properly constituted, it did not feel that the possibility of error should be ruled out. The Joint Committee stated that in its view the cases to which the Central Consultants and Specialists Committee had drawn attention provided evidence of mistakes in grading sufficient to justify further investigation, and it urged that they should be examined again.

The following reply has now been received from the Chief Medical Officer of the Ministry of Health:

"I promised to consider further your suggestion of an informal meeting, with documents, to discuss the grading of certain senior hospital medical officers. I have now done so in the light of what was said at that meeting, and on previous occasions when we have discussed these matters of grading."

"I must say, after the fullest consideration, that we are unable to accept the suggestion of a further review of these gradings. The review in 1951 was entrusted, with the agreement of both sides, to specially constituted professional committees and was accepted by both sides as final. I cannot see how we could justify questioning the decisions of these committees which were made on that understanding, and have now been put into practice. It seems to me it would greatly increase the difficulty of ever making any settled arrangements, if matters so definitely and finally decided could be reopened."

OCCUPATIONAL HEALTH SERVICES

The first meeting of the new session of the Occupational Health Committee was held at B.M.A. Headquarters on September 30. Dr. J. A. L. VAUGHAN JONES, on taking the chair, to which he had been re-elected, said that during last year the Committee had experienced difficulties and had not accomplished as much as was hoped. He trusted that this year they would achieve a considerable degree of unanimity and move forward. He welcomed the following new members of the Committee: Dr. J. J. O'Dwyer (nominated by the Association of Industrial Medical Officers), Dr. M. E. M. Herford (nominated by the Association of Certifying Factory Surgeons), Dr. J. M. Campbell, Dr. A. P. Robertson, Dr. F. Lishman, and Dr. Llywelyn Roberts (appointed by the Representative Body, the Council, the General Medical Services Committee, and the Public Health Committee, respectively).

The Planning, Remuneration, Occupational Dermatitis, Transport Medical Standards, and the D.I.H./D.P.H. Subcommittees were reappointed.

Ethical Rules for Industrial Medical Officers

The Committee proceeded to consider the decisions taken at the Annual Representative Meeting relating to industrial health. One of these decisions was that the ethical rules for industrial medical officers should be specifically brought to the notice of all such officers, whether members of the Association or not, and that the Representative Body hoped that such rules would be scrupulously observed.

It was suggested that, to give effect to this, an approach might be made through the honorary secretaries of Divisions, or that it would be sufficient to republish the rules in the *British Medical Journal*. It was pointed out that the majority of the people affected by these rules would be general practitioners engaged part-time in industrial medicine, and the difficulty of compiling any complete list was stressed. The compilation of a register of all those engaged in industrial medicine was urged. It was felt that, while information might be obtained from the Ministry of Labour about Appointed Factory Doctors, information about other sections in this branch of medicine must necessarily be incomplete.

It was agreed to recommend to Council that the rules should be brought to the attention of those concerned by publication in the *Journal*.

Private Certificates for Fitness

Another motion of the Representative Body which led to some discussion was that medical certificates required for fitness to undertake employment should be obtained from the independent medical referee at the expense of the prospective employers. It was pointed out in the Committee that, theoretically, the cost should be borne by the person applying for the job. Only if the man was already employed and the employer wanted a certificate in connexion with superannuation or some other matter should the cost of the certificate properly fall on the employer.

It was decided to ask the General Medical Services Committee for its interpretation of the precise meaning of the resolution.

A similar matter arose on a report from the Consultants and General Practitioners Liaison Committee, which stated *inter alia* that members of hospital medical staffs are not entitled to charge fees for examining and reporting upon prospective employees referred to them at hospital by general practitioners.

It was decided that this was not a question for the Occupational Health Committee, but one for the consultants, if they thought it desirable, to take up with the appropriate authorities. It was the general view of the Committee after discussion that no improvement in the position could be achieved without a new regulation.

Advisory Councils on Occupational Health

Attention was drawn to a letter from the Burton and District Advisory Council on Occupational Health which stated that nine councils would support the convening of a joint conference of advisory councils, and it was desired that such a conference should be sponsored by the British Medical Association. The holding of a conference had been considered by the Occupational Health Committee and the Council in 1951 and again in 1952, but had been withdrawn owing to financial considerations. The CHAIRMAN said that unless something was done the movement might collapse. It was agreed to recommend to the Council that such a conference, sponsored by the British Medical Association, should take place in the early part of next year.

Future of Occupational Health Services

The Committee then entered upon a long consideration of the already debated document—the memorandum on the future of occupational health services—on which some differences had arisen between the Committee and in particular the Public Health Committee. The comments of the latter and of other committees of the Association were brought forward. The CHAIRMAN said that he did not propose to allow discussion on the question of continued treatment at the factory. They were bound by the resolution of the Annual Representative Meeting: "That the Representative Body cannot agree that industrial medical officers should be permitted to undertake continued treatment of workpeople, and instructs the Council not to depart from the rules at present in operation."

If continued treatment went on in the factory it must do so only in consultation with the general practitioner.

In further discussion it was suggested that in any working population at least 10% were unaware of the name of their general practitioner; one member said that at one large works known to him he would be surprised if 80% of the workpeople had their cards in order. The CHAIRMAN, however, maintained that as 97% of the people of the country were registered with a doctor it was inconceivable that more than a small proportion did not know who their family doctor was.

Eventually it was agreed that the relevant passage in the memorandum describing the functions of an occupational health service should read: "treatment for minor conditions, in agreement with the general practitioner, in order that the worker may be enabled to continue at work." There were two dissentients.

Development of the Service

On the question of the development of the service, the general feeling of the Committee—each member being asked individually for his opinion—was that this should be encouraged independently of the National Health Service, but co-ordinated with it. One member pointed out that industry comprised so many varying factors, including the varying size and character of firms, that it would be very difficult to get a service going on what might be called a political basis.

The CHAIRMAN said that there had been active discussions in which some had expressed themselves in favour of development in conjunction with the National Health Service, but the general opinion was in favour of independent development, because it was feared that if occupational health became part of the larger service it would be a very minor part.

After some further discussion and consideration of amendments the revised document was generally agreed and will be submitted to Council.

It was agreed to set up a committee to consider the evidence to be given on behalf of the Association to the Departmental Committee which has recently been appointed by the Minister of National Insurance to review the provisions of the Industrial Injuries Act under which benefit is paid for diseases and for personal injuries not caused by accident.

SCOTTISH COMMITTEE JUBILEE

To celebrate the fiftieth anniversary of the founding of the Scottish Committee at Swansea in 1903 the Scottish Committee held a dinner at B.M.A. Scottish House, Edinburgh, on October 9. Advantage was taken of the occasion to entertain a number of prominent representatives of public life in Scotland, the guest of honour being the Secretary of State for Scotland, the Rt. Hon. James Stuart. The Committee was also glad to have the opportunity to do honour to the President of the Association, Mr. Tudor Thomas, and the Secretary, Dr. A. Macrae, whom they had not previously had a chance of welcoming since his appointment to the office. Other medical guests included Sir David Campbell, president of the General Medical Council, Dr. Mary Esslemont, president of the Medical Women's Federation, Dr. E. A. Gregg, Chairman of Council, and Dr. S. Wand, Chairman of the Representative Body.

The Very Rev. Dr. Charles L. Warr, Dean of the Thistle and Chapel Royal, proposed the toast of "The British Medical Association." The National Health Service, he said, would demand much of doctors in the coming years. It would require vision and patience and adaptability. He thought it must be accepted that the Health Service was an inevitable concept of modern society, and it was here to stay. It was up to everyone to make it the best health service in the world, staffed by the best general practitioners, consultants, and specialists. Dr. E. A. Gregg, Chairman of Council, replied to the toast and said it was

the Association's determined intention to see that the quality of the Health Service was of the highest.

The health of "The Guests" was proposed by Dr. J. B. Miller, Vice-President of the Association and an ex-chairman of the Committee. Mr. James Stuart replied on behalf of the lay guests and Dr. Macrae on behalf of the doctors. Mr. Stuart was one of several speakers who referred to the good relations existing between the Department of Health for Scotland and the Scottish Committee. He thanked the B.M.A. for these friendly and helpful relations, and he trusted they would continue. He assured the medical profession that he would do everything to maintain and foster these friendly relations.

Dr. S. Wand, Chairman of the Representative Body, proposed the health of "The Scottish Committee," and Dr. J. G. M. Hamilton, chairman of the Committee, replied. He said that the premises of Scottish House were now stretched to the limit, but plans for reconstruction had been made. They had been postponed, but the Scottish Committee hoped it would not be necessary to carry the postponement much further.

PARTNERSHIP CHANGES AND INCOME TAX

A CHANGED OPTION

Since income tax on profits is payable for one year on the basis of the amount of the profits of the previous year, a rule is needed on the liability for the year in which the person ceases to be entitled to the income—for example, when a business or practice changes hands. The normal rule is that the assessment for the last financial year—or part of that year—is made on the amount of the profits of that period, and that the assessment for the penultimate financial year can also, at the option of the Revenue, be adjusted to the amount of the profits of that year. There is a special rule applicable to the case where the change in proprietorship is not a simple transfer of the business or practice from A to B, but results from a change of personnel by the addition or withdrawal of a partner. As many medical practices are carried on in partnership, this rule is of some importance to doctors, and a change effected by Section 19 of the Finance Act of this year is explained here.

The special feature is that, in the case of a change in proprietorship arising from the entry or departure of a partner, the Income Tax Acts give an option to the group concerned: the choice is whether the practice is to be regarded (a) as having ceased and been recommenced at the date of change, or (b) as a continuing practice. This option still applies, but, whereas up to the present year non-exercise of the option resulted in the practice being treated as continuing, the reverse now applies. Thus, unless the option is exercised, the practice will now be regarded as having ceased and been recommenced. The choice may affect materially the amount of tax payable for two or three consecutive years, and there might be a conflict of interest between the individuals concerned. It may help to make the matter clear if one or two types of case are explained in some detail.

Two Cases

The simplest case is perhaps that of a sole proprietor of a practice who takes his assistant into partnership. Then the assistant's remuneration—including his car allowance if any—prior to his entry into partnership will have been treated as an expense of the practice, and the assessment for the following year will, to a greater or less extent according to the relevant dates, be based on the earnings of one practitioner only, though it will cover the liability of both practitioners. In such a case the continuing procedure is preferable, and failure to exercise the option will now affect adversely both partners.

Again, if the profits of the practice are rising, it will be to the advantage of all concerned to adhere to the previous

year's basis of assessment and therefore to exercise the option for the continuing basis. If, on the other hand, the profits have been falling in the recent past but may be expected to rise in the near future, there may well be a conflict of interest. An outgoing partner would gain by the cessation alternative—involving *ex hypothesi* a reduction of his liability for the final year—whereas the new firm's choice might be for the continuing basis. The option must be a unanimous one exercised by all the individuals concerned, outgoing as well as incoming partners, and such cases will obviously have to be dealt with by mutual arrangement between them.

The option, when exercised, is to be given by notice signed by all the persons concerned and sent to the inspector of taxes at any time within 12 months after the date of the change in proprietorship.

FAR TOO MANY REGULATIONS

SENSIBLE USE OF N.H.S.

Far too many regulations govern the work of the executive councils, said Mr. Macleod, Minister of Health, last week. He was speaking at the annual meeting of the Executive Councils Association (England), and added, "I hope we may one day reach a state when the Department issues general guidance that executive councils interpret and adapt to local conditions in the light of common sense."

The cost of prescribing at £46,300,000 a year, he continued, was prejudicing many other most urgent developments in the National Health Service. Executive councils might explain to the public the importance of using the Health Service sensibly and point out that patients must not expect doctors to prescribe for them whatever they thought they ought to have. In particular, household remedies for self-medication were things patients were expected to buy for themselves.

Growing Co-operation

Special reports from local health authorities had shown growing co-operation between general practitioners and these authorities. The build-up of clinical teams which would give the general practitioner the same kind of ancillary help as was available to doctors in hospitals necessarily took time, but he thought it was developing satisfactorily. In evidence he gave a number of examples:

At York three general practitioners asked for midwives to be allocated to attend antenatal clinics run for their own patients in their own surgeries, and this has been arranged.

At Wolverhampton a co-ordinated scheme of antenatal care based on a somewhat similar procedure had been agreed between the local health authority and the local general practitioners.

At Gloucester a special nursing service had been provided to relieve general practitioners of night visiting in order, for example, to give subcutaneous injections.

In Staffordshire a scheme was now in operation whereby the general practitioner referred any chronic-sick case which he considered could not be nursed at home to the area medical officer, who then tried to arrange for the patient to stay at home through the provision of home nurses and home helps. This had resulted in many patients being nursed at home who would otherwise be removed to hospital.

The Minister said he would like to see social workers as members of the general practitioner's clinical team—particularly valuable in helping him to care for unmarried mothers, handicapped persons, and old people.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

CHEMICALS THAT CAN BE PRESCRIBED

The Minister of Health has decided that the following diagnostic reagents are chemicals that may be prescribed by general practitioners: Dick test, protein sensitization test solutions. Schick test, tuberculin tests (Koch test, Mantoux test, patch test, diagnostic jelly).

The chemical reagents that may already be provided are the following: Benedict's solution (qualitative), diagnostic solution (tablets of copper), Fehling's solution, Gerhardt's reagent, indicators required for measurement of pH of urine, litmus papers, Rothera's reagent, and strong solution of ammonia.

Notes and News

Exchange of Hospitality.—A Swiss dentist would like his daughter, aged 19, to live with an English family for a time in order to learn the language, and in return offers hospitality to an English girl in his home at Vevey. Would anyone interested please communicate with Dr. H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1?

Hospitality Wanted.—A French doctor's daughter, aged 20, would like to live *au pair* with a doctor's family in this country for a year, and in return for hospitality would teach Italian, or Italian and French, but not French alone, as she wishes to keep up her knowledge of Italian as well as perfecting her English. Would anyone interested please write to Dr. H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1?

Correspondence

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

Senior Registrar Problem

SIR,—May I be allowed to correct an error which appears in your report of the meeting (October 1) of the Central Consultants and Specialists Committee (*Supplement*, October 10, p. 163)? During the discussion on the senior registrar problem I pointed out that the recent establishment of "transitional" senior registrar posts has given a breathing space of two years, during which a final solution to the problem must be found. As we have stressed in the past, this can only be achieved satisfactorily by expansion of the consultant establishment so that those senior registrars who are doing consultant work can be replaced by consultants. If steps in this direction are not taken within the near future there will be yet another crisis in eighteen months' time. At the same time I expressed the view that the agreed senior registrar establishment of 960 does not appear to be closely related to future consultant vacancies, particularly in certain specialties, and needs to be reviewed. Serology, as mentioned in your columns, was not among the specialties I quoted; but in such branches as cardiology, neurology, and others there appear to be far too many registrars in training, very few of whom can hope to succeed to the very limited consultant vacancies which seem likely to occur in these subjects.

Now is no time for complacency. The Ministry's recent action has averted a serious crisis, but further steps must be taken soon if the problem is finally to be solved.—I am, etc.,

JOHN N. WALTON,
Late Chairman, Registrars' Group, B.M.A.

The General Practitioner and the Hospital Service

SIR,—The articles in your issue of September 26, on general practitioners and the hospital services, by Sir Heneage Ogilvie (p. 707) and Dr. J. G. M. Hamilton (p. 711), and your editorial comments thereon (p. 719), gave great satisfaction here. The fact that three-quarters of the practitioners in the country are obliged to do their work without any hospital beds under their care is an anachronism that must be remedied if we are to have a first-class service in the future. The point is well made by both contributors that further beds in a large hospital present almost insuperable administrative difficulties, and the alternative method of setting up a large number of small local or "neighbourhood" hospitals, staffed by the local doctors, with visiting consultants, would seem the ideal and indeed the only solution.

How satisfactory that arrangement is can be testified to by all those—alas, only a minority of our profession—who have had the happiness to work in such an institution. The ability to discuss a difficult medical case at the bedside with the consultant, and personally to carry out the treatment he recommends; to assist at operations, and see for oneself the condition found; to treat some of one's patients as one did as a house-officer, with a consultant's guidance; to have x-ray and laboratory facilities, skilled nursing, and all the resources of a modern hospital at one's command—these are an inestimable refreshment, and cannot but result in an enhanced interest and efficiency in one's work. Such an arrangement furnishes a happier professional life for the doctor, and consequently a better standard of service to the patients he attends in his practice outside.

These things we in this district lost three years ago, but hope soon to have them back by means of a new local hospital set up by voluntary effort. What encourages us greatly now is the belief, borne out by your contributors and your leading article, that the importance of the small local practitioner hospital is really becoming recognized, and, instead of being gradually, by one pretext or another, shut down or converted to other use, as was their probable fate a very short time ago, it now seems possible that existing ones may be cherished and new ones set up as part of a healthier Health Service everywhere.—I am, etc.,

Kingston-on-Thames.

F. B. LAKE,
Chairman, Kingston and Malden Victoria
Medical Foundation.

SIR,—As one of those concerned in the fight three years ago to retain the Kingston Victoria as a general-practitioner hospital, I read your issue of September 26 with considerable interest.

It seemed to us at that time that the general-practitioner hospital, with consultant staff in regular attendance, was the only practical way in which to avoid that divergence of the great branches of our profession which is now causing so much concern, and to prevent each branch from working in splendid isolation to the detriment of our patients and ourselves.

I was therefore very encouraged to find our views upheld by two eminent writers—Sir Heneage Ogilvie (p. 707) and Dr. J. G. M. Hamilton (p. 711), who advocate the setting up of hospitals throughout the country of a type similar to the Kingston Victoria. There, local patients were attended throughout by their own doctors in close association with the consultant staff. This was very greatly appreciated by the patients and was a source of considerable pride in the neighbourhood.

The passing of this hospital was bitterly regretted, and energetic endeavours are being made to replace it by a new voluntary hospital on the same lines. Much as we wish these endeavours to succeed, however, we should find even greater satisfaction if professional and public interest in this very important matter could persuade the powers that be to reverse their policy by making general-practitioner hospitals an essential part of the hospital service of the country.—I am, etc.,

South Croydon, Surrey.

B. J. SKENTELBERRY.

The Care of the Tuberculous

SIR,—I am writing to congratulate the General Practice Review Committee on its report (*Supplement*, September 26, p. 131) in so far as the section on "The Care of Tuberculosis" is concerned.

Most chest physicians will agree that they do far too little domiciliary visiting, though they have a fair knowledge at second hand of the domestic problems confronting their patients. In the majority of cases, this is not due to a lack of sympathy with this aspect of their work, nor to the competing attraction of the purely clinical side. The cause is indeed not hard to find: simply lack of time. Many of us are in contract to give a fraction of our time (usually three-eighths) to the local authority for work in connexion with prevention and aftercare. The management of tuberculosis cannot of course be split into neat administrative compartments, but it seems clear that this portion of our time is not enough. The solution would appear to be more medical staff, but the need for an increase in domiciliary work may not be regarded by regional hospital boards as a strong argument for more adequate staffing.

One cannot conclude without a tribute to the general practitioners. If it were not for their sympathetic understanding of our difficulties, the domiciliary treatment of tuberculosis would have ended long ago in utter failure.—I am, etc.,

Wrexham.

E. CLIFFORD-JONES.

General Practice

SIR,—I wish to comment on some points made by Dr. Stephen J. Hadfield in "A Field Survey of General Practice, 1951-2" (*Journal*, September 26, p. 683), from the viewpoint of the junior hospital doctor.

Some practitioners complained that hospitals are encroaching on general practice by seeing patients without a doctor's letter. In many hospitals the lay clerks, whom the patients first encounter, are instructed not to refuse any patient asking to see a doctor for fear of turning away a serious case. The patients are sent to the casualty department. Here, when asked why they have not been to their own doctor, their answers—in approximate order of frequency—are: "The doctor is not at home"; "There is no surgery"; "until this evening and I didn't think I ought to wait"; "It's my doctor's half-day off"; "If I saw my doctor, he'd only send me here anyway"; "My doctor is on (often years ago for another complaint); "My doctor is on holiday"; "I'm not satisfied with my own doctor's advice"; "I haven't got a doctor."

In some districts in North London it is recognized that Thursday evening is the most hectic in casualty because so many doctors have Thursday as their half-day. Once a patient has been documented, has perhaps queued, and has eventually ensconced himself in casualty, it is kinder, quicker, and more pleasant to treat him rather than turn him away.

The reasons for retaining the attendance of patients longer than the general practitioner thinks necessary are a desire to finish a job one has started and to see its results, and a fear of patients complaining of incomplete and inadequate treatment if there is a relapse or complication. Some treatments are more easily performed by hospital doctors—materials are ordered, and instruments sterilized, prepared, and cleaned for us, whereas the general practitioner has to spend time doing all this himself.—I am, etc.,

Beckenham, Kent.

D. GOLDMAN.

The Cost of Drugs

SIR,—I have been grossly disappointed in the booklet "Costs of National Formulary and Proprietary Preparations." If we follow its guidance we will reduce the costs to the N.H.S. for drugs, but in a manner which the profession can hardly approve.

The booklet shows a large number of proprietaries which cost the Service less than do the official equivalents, and

E.C.N.129 says that in these cases the proprietary "should be prescribed." The booklet fails to remind us that the dispensing fee for proprietaries is less than is the dispensing fee for non-proprietaries (*vide* Drug Tariff, Part II, paras. 1 and 2, pp. 9 and 10). I am assured by pharmacists that, in every case where the list shows the cost of a proprietary to the Service as being less than the cost of the official equivalent, in fact the cost to the pharmacist at current market prices is more. The saving shown in the booklet arises only because a lower dispensing fee is paid. The list encourages us to use the products of the manufacturer of the more expensive form, and saves by paying the dispensing chemist a lower fee. Why, taking 24 tablets from a 500 bottle of "benerva" tablets, boxing, labelling, and wrapping them, should be worth only eight-pennyworth of the chemist's time, while doing the same thing from a bottle of tab. aneurin. hydrochlor. B.P. should be worth a shilling, is not clear to me.

If dispensing fees are too high the Ministry should open negotiations with the pharmacists with a view to reducing them. We are being asked to save costs by enabling it to pay a lower dispensing fee, even though it means prescribing a more expensive drug. It would be more honest and more effective, if the chemist is overpaid, to pay the lower dispensing fee for all drugs. We could then use a cheaper form in all cases, and effect an even greater saving.

E.C.N.129 tells us that in 47 instances we should prescribe a proprietary in preference to the standard preparation. This is tantamount to saying that we should not prescribe these standard preparations. Yet 29 of them bear in the Drug Tariff the double asterisk which signifies that the chemist "as far as is practicable shall stock them." One wonders who is to pay for this dead stock—the retail pharmacist again?

The idea of a list comparing the cost of proprietary and non-proprietary drugs is an excellent one, but it would seem that its preparation calls for more thoughtful co-operation between the concerned parties than the present booklet suggests. The illogical differential dispensing fee appears only to introduce confusion. It leads to a position in which savings are effected only by discouraging the manufacture of certain moderately priced standard preparations and reducing the pharmacist's dispensing fee in a covert, and therefore unpleasant, manner.—I am, etc.,

West Bromwich.

D. SAKLATVALA.

Proprietary Medicines

SIR,—I have recently received from the Ministry of Health, along with all general practitioners, a list of proprietary preparations which the committee set up to consider them states "have not been proved of therapeutic value."

While there may be a few preparations on this list over which some doubt may reasonably be expressed, the majority are ones which most of us practitioners have long considered, and in many cases proved to our own satisfaction by trial, to be nothing more than money-making adventures on the part of the firms responsible for them. When we have prescribed them for our patients it has only been when, by pressure, our line of least resistance has given way. With each prescription has sunk lower, in our own estimation, our status as physicians.

I continue to receive advertisements of these useless preparations; in fact my advertisement mail has increased since the publication of the committee's report. Until the advertising of this rubbish to the profession is stopped, waste of money on its purchase will continue, be it out of the patients' own pockets or the national purse.

My own method of dealing with the advertisers is to write to the firms as follows:

With reference to advertisement for ——— received to-day, I notice that the Ministry of Health list this preparation as one which has not been proved of therapeutic value.

I am surprised that you continue, in the face of reliable medical opinion, to advertise it. It causes one to lose faith in any preparation that you now or in future may advertise. Until you

cease the production and advertisement of — I shall avoid the use of your other preparations.

I am of the opinion that, by adopting this course, we could quickly stamp out the racket in many proprietary drugs, to the good of the general public and the betterment of the status of the general practitioner.—I am, etc.,

Manchester.

RAYMOND M. PEARCE.

Private Practice

SIR,—Time after time I have had applications from patients for acceptance on my N.H.S. list who freely state that they would prefer to be treated as private patients, but who imagine that by accepting private treatment they would automatically be debarred from the numerous hospital and other forms of medical treatment otherwise available to them.

This misconception is not only widespread, but general. So far as I am aware, neither the B.M.A. nor the Ministry of Health has taken any effective step to impress upon the public the fact that everyone, whether on a doctor's list or not, is entitled to all hospital and other medical services. This culpable policy of silence on such a vital matter is one of the direct causes of the lamentable state of private practice to-day, and is robbing general practitioners of an important potential source of income.—I am, etc.,

London, S.W.3.

VICTOR CONSTAD.

Sources of Income

SIR,—In company with other doctors whose list of N.H.S. patients is under 1,200, I have received a questionnaire as to other sources of earned income. I would make three comments:

(1) Why are we asked about "remunerative work of a non-medical character"? Surely the use of leisure is our private concern.

(2) Why are not also those with lists of over 1,200 questioned as to the industrial appointments, medical boards, insurance examinations, etc., they are able to undertake in addition to the extra hours spent in general practice?

(3) Those who can state correctly how many hours per week were spent in various types of work during the year ending last March must have a phenomenal memory.—I am, etc.,

Clifton, Bristol.

H. K. V. SOLTAE.

Association Notices

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS, 1954

The Council of the British Medical Association is prepared to consider the award, in 1954, of prizes to medical students for essays submitted in open competition. The subject of the essay will be: "Is the Medical Curriculum too Heavily Loaded?"

The purpose of this competition is to promote systematic observation among medical students. In awarding the prizes due regard will be given to evidence of personal observation. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. Previous prizewinners are eligible for a second award of a prize.

Any medical student who is a registered member of a medical school in the United Kingdom or the Colonial Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association will be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made. In determining the number and amount of prizes to be awarded, the Council will take into consideration the number and standard of essays received.

It is suggested that essays should consist of from 2,000 to 5,000 words. Essays must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a note of the name

and the medical school of the entrant. Notice of entry for this competition is necessary and a form of application can be obtained from the undersigned.

Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than December 31, 1953. Inquiries relative to the Competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

A. MACRAE,
Secretary.

Diary of Central Meetings

OCTOBER

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|-----------|---|
| 19 Mon. | Armed Forces Committee, 2 p.m. |
| 20 Tues. | Guillebaud Evidence Subcommittee, G.M.S. Committee, 11 a.m. |
| 20 Tues. | G.M.S. Subcommittee to Consider Maternity Medical Services, 2 p.m. |
| 20 Tues. | Industrial Injuries Evidence Subcommittee, Occupational Health Committee, 2 p.m. |
| 22 Thurs. | Full-time Non-professional Medical Teachers and Research Workers Group Committee, 2 p.m. |
| 22 Thurs. | International Relations Committee, 2 p.m. |
| 23 Fri. | Library Subcommittee, Science Committee, 11.30 a.m. (postponed from September 25). |
| 23 Fri. | Science Committee, 2 p.m. (postponed from September 25). |
| 23 Fri. | G.M.S. Subcommittee on Service Committee and Tribunal Regulations, 2 p.m. |
| 27 Tues. | Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.2), 2 p.m. |
| 28 Wed. | Compensation and Superannuation Committee, 2 p.m. |
| 28 Wed. | Welsh Committee (at Raven Hotel, Shrewsbury), 2.15 p.m. |
| 29 Thurs. | Anaesthetists Group Committee, 2 p.m. |

Branch and Division Meetings to be Held

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, October 20, 8.30 p.m., film evening: (1) "Some Aspects of Accessible Cancers—Cervix and Uterus"; (2) "The Nose Has It"; (3) "Senile Obliterative Arteritis of the Legs."

CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, S.W., Friday, October 23, 9 p.m., general meeting.

COVENTRY DIVISION.—At St. Anne's Church, Acacia Avenue, Coventry, Sunday, October 18, 6.30 p.m., annual church service.

EAST NORFOLK AND NORWICH DIVISIONS.—At St. Peter Mancroft, Sunday, October 18, 3 p.m., annual service for doctors, nurses, and members of the allied professions. Address by Dr. George H. Day.

GRIMSBY DIVISION.—At Field House, Grimsby, Thursday, October 22, 6.30 p.m., annual meeting; election of officers, etc. Followed by dinner, at which the principal guest will be Sir Ernest Finch.

HYDE DIVISION.—At Pack Horse Inn, Mottram, Wednesday, October 21, 8.45 p.m., meeting. Colour film: "Infections of the Hand." Discussion to be opened by Mr. R. T. Grime.

ISLE OF WIGHT DIVISION.—At St. Mary's Hospital, Newport, Sunday, October 18, 3 p.m., meeting. Lecture by Dr. Ernest White: "Differential Diagnosis of Anxiety and Depressive States."

KENSINGTON AND HAMMERSMITH DIVISION.—At Hammersmith Hospital, Duane Road, W., Wednesday, October 21, 2 p.m., ward visits for general practitioners.

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, S.E., Friday, October 16, 8.30 p.m., extra meeting of Division.

NORTH BEDFORDSHIRE DIVISION.—At Bedford General Hospital, Wednesday, October 21, 8.30 p.m., joint clinical meeting with Bedford Medical Society.

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, October 20, 2.30 p.m., Practitioners' Round; 8.30 p.m., meeting, programme arranged by Mr. J. H. Dobree.

NUNEATON AND TAMWORTH DIVISION.—At Chadwick Manor Hotel, Knowle, Saturday, October 24, 8.15 p.m., annual dinner and dance.

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, October 19, 9 p.m., meeting. Dr. Oscar Janus: "Arthritis in General Practice."

STRATFORD DIVISION.—At Queen Mary's Hospital, Stratford, E., Tuesday, October 20, 9 p.m., annual general meeting.

SWINDON DIVISION.—At Goddard Arms Hotel, Swindon, Friday, October 16, 9 p.m., annual general meeting. Election of officers, etc., and consideration of revised ethical rules.

WEST DENBIGH AND FLINT DIVISION.—At Sanatorium, Llan-gwyfan, near Denbigh, Friday, October 23, 3 p.m., clinical meeting. Symposium: "The Necessity for Regarding Tuberculosis as a General Disease Therapeutically."

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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SOME HEALTH SERVICE DEVELOPMENTS

BY

ARTHUR BEAUCHAMP, M.B., Ch.B.

It has been obvious that integration of the services included in the National Health Service must be brought about if the patient and the doctor are to get the full benefit of that Service. In Birmingham we have believed that the right way is to experiment locally, and then if it is successful to spread the experiment further, not only in area but in content.

Direct Access to Special Services

The first effort was to ask for direct access for general practitioners to pathological and x-ray services. The sound reasons behind these requests were immediately appreciated by the regional hospital board and board of governors, and free access to pathological services was given; the principle of free access to radiological facilities was admitted and of free access to radiological facilities was implemented. The promised when it was possible to implement the idea. The pathologists worked out the details with representatives of the local medical committee. The scheme has been economical in cost, is not abused, and extends the knowledge of the general practitioner.

A Glimpse for Students

The next step to be taken was to show final-year students the attractiveness of general practice. This had to be a joint effort between the dean of the medical school and the local medical committee. We are fortunate in having as dean Professor A. P. Thomson, who welcomed the idea with great enthusiasm. The scheme was that general-practitioner teachers, selected by the dean, should have a final-year student for a fortnight. The students were asked to select from the list the general practitioner to whom they would like to go, and in spite of the fact that it was entirely voluntary over 80% of them agreed to spend a precious fortnight of their final year learning something of general practice.

Hospitals Welcome G.P.s

A further step has now been taken. The dean, who is also an active clinical teacher, has invited the general practitioners to visit their patients in hospital. It may be said with truth that it has always been possible to visit our patients while they are in hospital, but in many cases the general practitioner was tolerated and often unwelcome by

reason of the fact that he arrived at a time which was awkward for the nursing staff. Indeed, on one occasion, when asking if I might see a child in whose condition I was interested, I was asked by a student nurse if I was the father of the child. Once in the ward, the next problem was to find a house-man who could tell the general practitioner something about the case and explain what was being done; this might take anything up to 20 minutes.

The scheme suggested by Professor Thomson gets rid of all these difficulties. Registrars and house-officers will be on duty in their wards from 2.30 to 3.30 p.m. on two days a week. They will welcome the general practitioner, and will not only discuss his patient with him but will be able to guide him gently through the morass of unintelligible findings of weird and wonderful investigations. How badly many of us need this guide. And how happy we shall be to tell the registrar of the patient's family history, his home environment, his fears and his hopes. Together we can discuss the treatment to be given when the patient returns home, and with our full knowledge of home conditions be able to advise on whether to send him out early or not.

Comfort to Patient

Many of us feel that this scheme will not only be a valuable form of postgraduate education but will engender the feeling that the general practitioner plays not a separate but an integral part in the medical services which the patient receives. Perhaps the most important fact of all is the comfort it will give to the patient. He will feel no longer that his doctor has sent him away from his home to live in a strange, sterile place, in the care of women he has never seen before, treated by a group of doctors about whom he knows nothing, but that his treatment is a continual process, with the stay in hospital an interlude, and his friend his own doctor is part of the team responsible for his health.

The scheme will cater for some 500 general practitioners in Birmingham and is confined at present to the general hospital, but if it is successful there is little doubt that more hospitals, both teaching and non-teaching, will be included, and that practitioners from the surrounding counties of Staffordshire, Worcestershire, and Warwickshire will avail themselves of this generous offer. When this is working well there are many logical steps along the same road which can be easily taken. With the welfare of the patient and the improvement of the Service (which are really one and the same thing) as the guiding principle for all concerned, it is felt that progress towards the end which we all desire can be achieved.

Scottish News

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

The first meeting of the session was held at the Scottish Office, Edinburgh, on October 1, when Dr. J. T. BALDWIN (Milton Bridge) and Dr. C. J. SWANSON (Aberfeldy) were reappointed chairman and vice-chairman respectively. The Subcommittee appointed various subcommittees and nominated representatives to serve on other bodies.

Dr. A. F. WILKIE MILLAR, chairman of the Scottish Medical Practices Committee, commented on a few of the matters which had recently been occupying the attention of his committee. In view of his comments it was decided that representatives of the Subcommittee should seek a meeting with representatives of the Scottish Medical Practices Committee and the Department of Health for Scotland to discuss two points—namely: (1) the admission to the executive council list of a whole-time assistant as a principal in the same area; (2) the hearing of an appeal against the appointment of a successor in a practice vacancy.

The Subcommittee was not in favour of a whole-time assistant being admitted as a principal in the same area, and felt that the present arrangement for an appeal against the appointment of a successor in a practice vacancy should be examined. At the present time, when an appeal is made, only the case of the appellant is reconsidered. It was felt that consideration might be given to a provision which would require that all the unsuccessful candidates' cases should be examined when an appeal was made.

The Subcommittee also considered certain anomalies which had arisen from the provision in the distribution scheme whereby "restricted lists" carry no loaded capitation fees and a percentage reduction in ordinary capitation fees. As a result of this discussion it was decided that representatives of the Subcommittee should meet the Department of Health to discuss certain proposals to overcome any difficulties in this connexion.

Increasing Use of Ambulances

It was reported that representatives of the Subcommittee had had discussions with the Department on the continued increase in use of the ambulance service. The representatives had agreed that local medical committees should be asked to interview any general practitioners who appeared to be using this service excessively or improperly. It was explained that local medical committees, while being asked to interview practitioners, would have no power to impose any penalties. It was hoped, however, that by such interviews general practitioners might become aware of the difficulties of the situation. The Department had undertaken that the attention of the hospital service would be drawn to the serious situation which had arisen in connexion with the number of services provided by ambulances, and that hospitals too would be required to take steps to bring about a reduction.

The Subcommittee also received from the Department some amendments to the Medical and Pharmaceutical Services Committee and Tribunal Regulations for their consideration. The Subcommittee decided not to consider the proposals at this stage but to await the final report from the special subcommittee of the General Medical Services Committee which was considering the general question of service committees.

Registrars Group.—The annual general meeting of the South-west Metropolitan (Eastern Area) Regional Registrars Group will be held at B.M.A. House, Tavistock Square, London, W.C.1, on Tuesday, November 10, at 7.30 p.m. All senior registrars and registrars in the area are invited to attend. Dr. E. E. Claxton, Assistant Secretary of the B.M.A., will speak on "Current Problems in the Registrars' Field."

DOCTORS AND PHARMACISTS

SOUTH MIDDLESEX DIVISION MEETING

A combined meeting of doctors and pharmacists was held at Hounslow on October 14 at the invitation of the chairman of the South Middlesex Division of the B.M.A. An informal dinner was followed by a general discussion, the object being to allow members of both professions to get to know each other. Dr. Henry Bergh, chairman of the South Middlesex Division of the B.M.A., presided over a company of 60.

Mr. Harold Moss, chairman of the Thames Valley branch of the Pharmaceutical Society, said that a new problem was that concerned with the result of the Cohen Committee Report. Although it was obvious to both professions that the Service was costing too much, the problem now facing pharmacists was: What were they going to be left with? Doctors, on the other hand, had the trouble of going through the lists, and at least one doctor he knew had said: "N.F. for me in the future," so the good tended to be thrown out with the bad. This attitude would not help doctors, pharmacists, or the public. The report also posed a very real problem for the manufacturers: Were they going to spend thousands of pounds a year on research when the product might be placed in category 5 or 6?

Mr. Moss next mentioned the new regulations for supplying trusses and elastic hosiery, and pointed out that, if a pharmacist accepted a prescription which did not conform, it would not be paid. The patient had then to be sent back to the doctor.

Question Time

The chairman then invited questions. In reply to questions put by several doctors, pharmacists explained the difficulties connected with ambiguous prescriptions which would cause complications in the Pricing Bureau if they did not comply with tariff requirements. The marking of "urgent" prescriptions was mentioned, with a request for such marking if the doctor considered that the patient required the medicine after 7 p.m. One doctor complained of difficulty in remembering doses of new preparations and asked whether, no dose being given on the prescription, the pharmacist could dispense an intermediate dose. He was told that this could be done, but not with Schedule 4 preparations. Pharmacists agreed that they would be willing to advise doctors if they prescribed products in categories 5 and 6.

With regard to the prescribing of oxygen, one doctor suggested that the present position was unsatisfactory and that oxygen should be delivered by ambulance. Divergent views were expressed on this point by two pharmacists, one agreeing that the responsibility should be taken over by the local authority, while another emphatically stated that the proper source of supply was the pharmacist. He explained that requests to the Ministry had been made unsuccessfully for a delivery fee and asked for the doctors' support in their application.

When pharmacists were asked their opinion on the charge for bottles under the N.H.S., it was explained that the deposit system which operated under the N.H.I. was unsatisfactory, but that payment by the patient for the bottle would be acceptable.

One pharmacist emphasized the dangers of prescribing for two patients on one form, particularly when one was a child and the other an adult. The meeting was reminded that this practice was directly against the terms of service, and that most doctors were aware of its dangers. Prescriptions for double-strength mixtures, often received by another speaker, sometimes had the incorrect dosage, and he suggested that such prescriptions be endorsed accordingly.

In proposing a vote of thanks, Dr. W. A. Shearman expressed his gratitude to Mr. Moss for his work in making the evening such a success. Mr. K. W. Richardson thanked the chairman, Dr. Bergh, and Dr. G. C. L. Woodroffe (secretary to the South Middlesex Division), who first had the idea of holding the meeting. Dr. Woodroffe in reply said he hoped to have an attendance of 100 next year.

PUBLIC HEALTH MEDICAL OFFICERS

MOTOR-CAR ALLOWANCES

The following M.D.C. circular No. 18, on motor-car allowances for public health officers in England and Wales, has been issued by Whitley Committee "C."

With reference to the scheme of motor-car allowances appended to M.D.C. Circular No. 13, dated October 15, 1951, we have to advise you that Committee "C" of the Medical Whitley Council has now agreed that the following two paragraphs should be added to that enclosure. The effect of these paragraphs is to ensure that when an officer is entitled to an allowance for only part of a year the mileage in respect of which he is entitled to receive a higher allowance (cf. paragraph 4 of Enclosure to M.D.C. Circular No. 13) during that part of a year should be reduced to a suitable fraction of 7,200 miles.

1. The period over which the car allowances are paid should be from April 1 in any year to the succeeding March 31.
2. In the case of an officer who takes up an appointment with a local authority after April 1 in any year, or leaves a local authority to take up an appointment with another local authority, or alternatively leaves the local government service altogether, the allowance should be so calculated that the amount payable bears the same proportion to a full year's allowance as the number of months in the year during which the officer uses his car bears to twelve.

The calculation of the mileage allowances would thus be made on a proportionate basis in accord with the following procedure:

- (a) The mileage allowance to be paid at the higher rate would, at 7,200 miles per annum, be equivalent to 600 miles per month of service.
- (b) The excess over 600 miles per month of service would be paid at the reduced rate—for example, where the total service in the financial year is five months, then up to 3,000 miles would be paid at the higher rate, and the excess over 3,000 miles would be paid at the lower rate.

Similarly the lump sum payment should be divided into 12 monthly payments. Where an authority pays the allowance quarterly, the appropriate calculation should be made on the basis of dividing by four instead of twelve.

When an officer leaves the service of an authority, a calculation shall be made in respect of his entitlement for the portion of the year served with the authority and any necessary adjustment made thereafter.

EXECUTIVE COUNCILS ASSOCIATION

ANNUAL MEETING

The annual meeting of the Executive Councils Association (England) took place at Torquay on Thursday and Friday, October 8 and 9, presided over by Captain S. H. HAMPSON, the president of the association.*

Dr. F. E. GOULD (Birmingham) moved to request the Minister of Health to remove the restrictions on patients changing doctors. Circumstances had altered since 1950, when the restriction was made; the Health Service had become stabilized, people had settled down, they had their doctors, and they knew what they wanted. The number of changes was considerably less, and the time had come when patients should have the right to immediate transfer.

The motion was opposed by most speakers and was lost. Dr. J. T. DALY (Worcestershire) proposed a motion asking the Minister to reconsider the view that, where a woman was to be confined in hospital, the hospital should normally assume responsibility for all antenatal and post-natal care, and that the Executive Councils Association consider that the provision of such care by a general practitioner was complementary to the service provided by the hospital and essential for the welfare of the patient.

*The Minister of Health's address was reported in the Supplement of October 17, p. 169.

Dr. J. KERR (Cheshire) moved an amendment to the effect that it was of the utmost importance that such services should be given against the background of the patient's home circumstances and manner of life and that arrangements for the whole of the antenatal and post-natal care to be given in a hospital should be the exception rather than the rule, and the motion was carried in that form.

Access to Pathology Services

Mr. N. BAYLISS (Staffordshire) brought forward a resolution urging the Minister to press hospital management committees to implement his expressed wish that x-ray and pathological services should be made available to general practitioners at an early date.

Alderman Mrs. CHAMBERS (Bradford), seconding, said that consultants should welcome general practitioners as colleagues and realize the help that they could give.

Dr. H. P. FAY (Stockport) said that in his area no difficulty was put in the way of a general practitioner who wished to make use of hospital x-ray and pathological services; on the contrary, he was helped in every possible way.

Brigadier W. LESLIE, for the management committee, said that what was wanted was direct access by the general practitioner to these departments in order to save time; the committee supported the resolution, which was carried.

It was noted in the committee's report that the Minister's medical advisers had informed the Queen's Institute of District Nursing that, where a home nurse found surplus drugs in a house, in the interests of safety and with the consent of the householder she should destroy them. Dr. R. W. McCONNEL (Bucks) thought this advice led to great wastage, and asked that the management committee should reconsider the matter with a view to a doctor or nurse removing such things for use with other patients. Alderman H. C. BROWN (past president) said that the committee felt that, although there might be some wastage, in the interests of safety it was very much better to adopt the recommendation of the Minister. A motion from Essex that the present position under which responsibility for the collection of oxygen cylinders for the treatment of patients rested with the patient's personal representatives was entirely unsatisfactory and that arrangement should be made for the delivery of the cylinders at the cost of the Service was carried.

Charges for Drugs

Alderman A. BUXTON (Rotherham) moved to urge the Minister to repeal the charges for drugs and appliances in view of the discouragement to economy in prescribing and the hardship and inconvenience to old-age pensioners and others by its imposition. The introduction of the charge, he said, had not achieved its object. Doctors' surgeries were as full as ever; in his area more prescriptions had been issued than there were two years ago in the same period. One had to bear in mind the effect of the 1s. charge on the lower wage-earning group: one family with two children paid out 12s. for prescriptions when they were ill with measles. The fear of such expense deterred mothers from taking their children to the doctor at an early stage.

Dr. R. W. McCONNEL (Bucks) opposed the resolution. He said that the object of the regulation was to make money, and it was making money. At the present time the Ministry, the doctors, and the chemists were trying to find the way to economy. If the 1s. was taken away the Government would drop the revenue and would put it on something else or limit the range of drugs.

Mr. H. A. SWEET (Southampton) supported the resolution on the words "old age and hardship." He would prefer to see the management committee instructed to make representations to the Minister on behalf of old-age pensioners and members of the community suffering from hardship. Many preferred to pay the 1s. rather than approach the National Assistance Board and reveal their means before that august body.

Alderman BUXTON said that what was happening was that Health Service costs were being diverted to another Government department. According to the report of the National

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Ostlere, G.: Trichlorethylene Anaesthesia. 1953.

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Pichler, E.: Der Kopfschmerz. 1952.

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H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel R. W. Scott, O.B.E., has retired on retired pay, and has been granted the honorary rank of Colonel.
Major T. McEvel to be Lieutenant-Colonel.
Major H. R. Hartnell, M.B.E., has retired with a gratuity, and has been granted the honorary rank of Lieutenant-Colonel. (Substituted for the notification in a *Supplement to the London Gazette* dated April 21.)
Major G. M. Homan has retired on account of disability.
Captain R. Houston has resigned his commission and has been granted the honorary rank of Major.
Captain D. H. Provan to be Major.
Short Service Commissions.—Captains J. W. Weston, M. S. C. Rooney, and J. S. Webster, O.B.E., to be Majors. Major J. W. Weston has retired with a gratuity. (Substituted for the notification in a *Supplement to the London Gazette* dated August 7.)

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Honorary Colonel) A. D. Bourne, R.A.R.O., to be Major.
Major O. Walker, from R.A.R.O., to be Major.
Captain (Honorary Major) H. K. Meller, M.B.E., from T.A.R.O., to be Captain, and has been granted the acting rank of Lieutenant-Colonel.
Captain A. W. Weller has been granted the acting rank of Major.
Lieutenant (War Substantive Captain) E. H. J. Smyth, from Emergency Commission, to be Captain, and has been granted the acting rank of Lieutenant-Colonel.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: A. G. Farr, M.B.E., M.B., B.Ch., D.T.M.&H., D.P.H., D.I.H., and D. E. Thompson, M.B., B.Ch., D.T.M.&H., Senior Medical Officers, Tanganyika; J. Carnegie, M.B., J. F. Grech, M.D., and F. A. Viapree, M.B., Medical Officers, Nigeria; R. Noble, F.R.C.S., M.R.C.O.G., Medical Specialist (Obstetrics and Gynaecology), Jamaica; W. A. Dos Santos, M.B., Ch.B., D.Bact., Pathologist, Grade A, Trinidad and Tobago; E. V. Strisiver, M.D., F.R.C.S., Specialist, Sierra Leone; P. Grech, M.D., and J. H. Jackson, M.B., B.S., Medical Officers, Tanganyika; K. S. Alstad, M.D., M.R.C.P., D.P.H., Physician Specialist, Federation of Malaya; C. A. Brand, M.D., Medical Officer, Gold Coast; M. Stilton De Piro, M.D., and J. Gatt, M.D., House Physicians and Surgeons (Temporary), Nigeria; I. M. Dingwall, M.B., Ch.B., Medical Officer, Barbados; J. T. C. Glover, M.B., B.S., Medical Officer, Local Civil Service, Gold Coast; A. K. Mitra, M.B., B.S., D.P.H., D.T.M.&H., Assistant Medical Officer of Health, Aden; H. J. Penkala, M.B., Ch.B., Assistant Medical Officer (Inspec.), Bahamas. The appointment of B. V. Earle, M.D., M.R.C.P., D.P.M., should read Medical Superintendent, Mental Hospital, British Guiana and not Barbados as stated in the *Supplement to the Journal* (July 4, p. 10).

Association Notices

Diary of Central Meetings

OCTOBER

30 Fri. Guillebaud Evidence Subcommittee, G.M.S. Committee, 2 p.m.

NOVEMBER

3 Tues. Exchange of Practices Subcommittee, G.M.S. Committee, 2 p.m.
3 Tues. Orthopaedic Group Committee, 2 p.m.
4 Wed. Council, 10 a.m.
5 Thurs. Guillebaud Evidence Subcommittee, Private Practice Committee, 2 p.m.
11 Wed. Psychological Medicine Group Committee, 2 p.m.
12 Thurs. Amending Acts Committee, 2 p.m.
13 Fri. Public Health Committee, Special Meeting, 10.30 a.m.
17 Tues. Subcommittee on Admission of Students to Medical Schools, 2 p.m.
18 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
19 Thurs. Film Committee, 10 a.m.
27 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.
27 Fri. Industrial Injuries Evidence Subcommittee, Occupational Health Committee, 2 p.m.

Branch and Division Meetings to be Held

COVENTRY DIVISION.—At Gymnasium, Coventry and Warwickshire Hospital, Tuesday, November 3, 8.30 p.m., annual B.M.A. Lecture by Mr. A. Lawrence Abel: "Some Common Diseases of the Rectum and Anal Canal." Followed by film: "Modern Operation for Carcinoma of the Rectum."

DARTFORD DIVISION.—At Joyce Green Hospital, Dartford, Thursday, November 5, 2.30 p.m., clinical meeting. All medical practitioners in the area of the Division are invited.

ISLE OF WIGHT DIVISION.—At St. Mary's Hospital, Newport, Saturday, November 7, 2 to 5 p.m., and Sunday, November 8, 10 a.m. to 4 p.m., refresher course.

KENSINGTON AND HAMMERSMITH DIVISION.—At Hammersmith Hospital, Duane Road, W., Wednesday, November 4, 2 p.m., ward visits for general practitioners.

LAMBETH AND SOUTHWARK DIVISION.—At Lambeth Hospital, Brook Drive, Kennington Road, S.E., Sunday, November 1, 11 a.m., clinical meeting.

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, S.E., Friday, November 6, 8.30 p.m., meeting. Dr. T. M. L. Price: "The Early Signs of Cancer."

MIDLAND BRANCH.—(1) At Lecture Theatre, Nuffield House, Queen Elizabeth Hospital, Birmingham, Friday, October 30, 8 p.m., meeting of Clinical and Pathological Section. (2) At 154, Great Charles Street, Birmingham, Thursday, November 5, 3 p.m., 92nd annual meeting. Address by retiring President: "Mechanics with Tears."

MONMOUTHSHIRE DIVISION.—At Tredegar Arms Hotel, Newport, Tuesday, November 3, 8.15 p.m., dinner followed by a clinical discussion on "Headache." Special speakers, Mr. L. J. Horne, Dr. Aneurin Hughes, Dr. J. C. H. Bird, and Dr. J. D. Spillane.

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, November 3, 2.30 p.m., practitioners' round.

NORTH WALES BRANCH.—At Royal Hotel, Capel Curig, Thursday, November 5, 3 p.m., autumn meeting. B.M.A. Lecture by Mr. Emlyn E. Lewis.

NORWICH DIVISION.—At Assembly House, Norwich, Tuesday, November 3, 7.30 p.m., invitation by Norwich and District Branch of Pharmaceutical Society to B.M.A. Lecture by Mr. A. R. Channings: "New Drugs and the B.P. 1953."

NUNEATON AND TAMWORTH DIVISION.—At Red Lion Hotel, Atherton, Tuesday, November 3, 8 p.m., informal supper; 8.45 p.m., meeting. Symposium to be opened by Dr. P. A. V. Barford: "Hypertension."

REIGATE DIVISION.—At Burford Bridge Hotel, Dorking, Wednesday, November 4, 7.30 for 8 p.m., 51th annual dinner and dance.

ST. PANCRAS DIVISION.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, November 3, 8.30 p.m., meeting. Dr. Dorothy F. Egan: "The Functions of Health Visitors and the Possibility of Co-operation Between Them and General Practitioners."

SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Wednesday, November 4, 8.30 p.m., meeting. Mr. M. R. Ewing: "The Clinical History and Diagnosis of Cancer of the Large Bowel."

SHROPSHIRE AND MID-WALES BRANCH.—At Royal Salop Infirmary, Shrewsbury, Tuesday, November 3, 8.30 p.m., meeting.

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Tuesday, November 3, 8.30 p.m., meeting. Address by Mr. W. A. Law: "The Place of Surgery in the Treatment of Arthritis."

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, November 6, 9 p.m., meeting. Dr. Andrew Topping: "The Medical Profession—A House Divided."

WEST SUFFOLK DIVISION.—At Everard's Hotel, Bury St. Edmund's, Saturday, November 7, 7.30 for 8 p.m., 27th "Doctors' Armistice" Dinner.

Meetings of Branches and Divisions

BOLTON DIVISION

The annual general meeting was held at the Victoria Hotel on July 30, 1953. There were 11 members present. The following officers were elected for 1953:

Chairman.—Dr. L. F. Evans.
Vice-chairman.—Dr. E. P. Johnson.
Joint Honorary Secretaries.—Dr. R. A. Cranna and Dr. M. S. Rowley.

WINCHESTER DIVISION

The annual meeting of the Winchester Division was held at the Royal Hotel, Winchester, on October 3. Dr. Ronald Gibson was in the chair, and 51 members were present. The following officers were elected for 1953-4:

Chairman.—Dr. C. F. Cope.
Vice-chairman.—Dr. H. L. Cronk.
Hon. Secretary and Treasurer.—Dr. G. Swift.
Public Relations Secretary.—Dr. Ronald Gibson.
Representatives to the A.R.M.—Mr. H. H. Langston and Dr. G. Swift.

The meeting was followed by a dinner, after which Dr. O. C. Carter addressed the meeting in response to the toast of "The B.M.A."

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HEALTH SERVICES CONFERENCE
MAKING THE MOST OF PRESENT RESOURCES

The Institute of Public Administration arranged a Health Services Conference at Church House, Westminster, on October 28-30. A large attendance of representatives of hospital boards, executive councils, local health authorities, and local medical committees from most parts of the British Isles assembled under the chairmanship of Mr. HENRY LESSER for discussions on the general theme of "Making the Most of Present Resources."

Domiciliary and Out-patient Services

In discussing the question, "Should domiciliary and out-patient services be extended?" Professor A. LESLIE BANKS (Cambridge) pointed out that a great deal of work formerly done in the ward was now done in the out-patient department, and more could be done but for cramped accommodation. In studying the working of a large provincial group of hospitals as seen by the consulting staff, no great tendency had been noted on the part of general practitioners to unload "rubbish" on to the hospital. In considering domiciliary care three social factors had to be taken into account: (1) the changes in age structure of the population, with an increased number of elderly patients with prolonged or recurrent maladies; (2) inadequate housing; (3) the preference of the public for hospital care, particularly expectant mothers for maternity accommodation. We had not reached the American standard of "99% of confinements in hospital and the remaining 1% in taxis," but in some parts of this country 80% were hospital deliveries.

Professor Banks said that Kipling might have written his story "The Ship that Found Herself" around the present state of medical care. The objective was known, the highly skilled organization was available, but time and effort were wasted in trying to run the service in three different sections, each of which, like the components of Kipling's ship, groaned against the others. A corporate spirit was lacking. There ought to be in the National Health Service a trained corps of administrators, lay and medical, trained not only in their own departments but in the others, who appreciated the need for an integrated service, interpreted the regulations liberally, and themselves formed a team undivided by administrative boundaries.

Dr. H. K. COWAN (M.O.H., Essex) considered that the resources immediately available were not used to capacity. One of the pressing problems was the care of the chronic sick, but there were special hospitals and wings of general hospitals for the chronic sick, geriatric homes, health visitors, home helps, public assistance officers, voluntary workers, and a host of other agencies concerned with the problem. Under experienced geriatricians it was now possible to rehabilitate chronically sick people who had been confined to bed for a long period, to mobilize the apparently immobile, and to return people to their homes to live in reasonable comfort. It was remarkable that so little had been done to provide a domiciliary geriatric service at all comparable with the modern geriatric units in hospital. The time was overdue for the chronic sick to receive domiciliary service, with home nursing, physiotherapy, chiropody, and so on. In many areas there were numbers of women who were not only State-registered nurses but had undertaken a considerable amount of post-certificate training to enable them to take the techniques learned at hospital into the more difficult life of the home. There was no reason why these women should not deal, if home conditions were suitable, with cases in the early stages of recovery so that they could be discharged from hospital at an earlier date.

The General Practitioner and the Home

Dr. A. BEAUCHAMP (Chairman, Birmingham Local Medical Committee) said that if patients were sent home under skilled nursing care it would alleviate the problem. But the general practitioner was the only person who knew to what kind of home the patient would return, and in thirty years' practice he had never been asked by a hospital officer whether the home was suitable for earlier return. Domiciliary nursing presupposed an adequate nursing service, and home helps as well as district nurses were in short supply. "In general practice I want a nurse who can go into a home and nurse a 14-stone patient in a double bed in a single room."

Many out-patient departments, Dr. Beauchamp continued, were "a bit like Paddington station." Much could be done by reorganization without rebuilding. Medical staff did not keep their appointments at the proper time. Patients were called *en bloc* for 9 a.m., and some of them not seen until 11. The out-patient hall was an anachronism.

Women should not be encouraged to go into hospital for normal confinement. They were just as safe or safer in their own homes. Hospital midwifery in America in no way compared with domiciliary midwifery here. In teaching hospitals it cost £20 a week for a woman to have her baby in hospital. The answer to the question before the Conference was: "Use properly the resources already available."

Dr. J. GREENWOOD WILSON (M.O.H., Cardiff) said that after Dr. Beauchamp's speech he would never say again that the general practitioner had not got a preventive outlook. Professor Banks wanted to have a trained corps of administrators, but until 1946, when a dynamic personality said that the Service, like Gaul, must be divided into three parts, the administrators had not been conscious of any such division.

Mr. WILLIS (clerk to the Rotherham Executive Council) suggested that medical officers of health, secretaries of hospital management committees, and clerks of executive councils in each locality should meet together on a principle of co-option to each other's councils; also that doctors staffing out-patient and casualty departments should get together with the general practitioners. Dr. J. O. F. DAVIES (Oxford) said that the dismal (and rather overdrawn) picture of geriatric patients would be greatly ameliorated if hospitals shared the responsibility with the home and the general practitioner. Dr. HOWIE WOOD (Isle of Wight Local Medical Committee) said that executive councils had the full confidence of general practitioners and had proper medical representation, which did not obtain in other branches of the Service. He had yet to hear of an executive council which complained of being "bossed around" by its medical members, but in regional hospital boards there were murmurs of an undue degree of medical representation. Mr. JOHN DODD (Secretary, Bristol Local Medical Committee) gave some glaring examples of delay in informing the patient's doctor of his discharge from hospital or of his death. Dr. A. TALBOT ROGERS urged that out-patient departments should be consultative only. When doctors sent patients to a consultant they did so for his opinion and advice; the same should obtain in the out-patient department.

The Economics of Prescribing

Another session was devoted to the possible contribution of the medical profession to economy in prescription and treatment. Dr. A. M. G. CAMPBELL, whose paper was read for him by Dr. Glyn Hughes, said that at Bristol Royal Hospital an economy committee consisting of five members of the staff had set itself to cut down the increasing drug bill, especially for antibiotics. The chief dispenser outlined to them each month the individual items and their cost, and after discussion, if any expenditure was thought excessive, steps were taken to curtail it. As a result there had been a saving of about £1,000 a year. The pharmacists had been told wherever possible to dispense B.P. drugs as opposed to any proprietary compound, unless the latter was specifically ordered by the consultant. Economy in general practice, however, was a much more difficult matter. The general practitioner was more likely to prescribe a drug that could be given by mouth rather than injected. One general practitioner of his acquaintance tended to prescribe proprietary compounds because he could remember their names more easily, and in a busy practice it was a consideration to be able to write one word instead of three. The College of General Practitioners should interest itself in economy and correct use of drugs.

The Question of Proprieties

Mr. JOHN HANBURY (Allen and Hanburys Ltd.) said that antibiotics accounted for about 40% of the expenditure on drugs and dressings in hospitals to-day. But if the rational use of antibiotics shortened the patient's stay in hospital by a few days or weeks (the average weekly cost of a patient in a hospital bed being £15) it was well justified economically. It was assumed that proprietary drugs were more costly than their non-proprietary equivalents, but in a representative cross-section of commonly prescribed substances it was found that, while 48% of the proprietaries were dearer, 35% were cheaper. Some would like an absolute embargo on proprietaries. This would lead to the rise of imitators, who would make their products as cheaply as possible and be unable or unwilling to accept adequate pharmacological or other control.

Mr. Hanbury added that by far the greater number of drugs introduced to the medical profession during the last 30 years had been worked out in the research laboratories of pharmaceutical chemists. The pharmaceutical industry had rendered good service to the profession and to national health, and the discouragement of proprietary products would bring the imitator right into his own. At the same

time, he was no believer in *laissez-faire*. Some degree of guidance and restraint to discourage excessive prescription was imperative.

Dr. STANLEY THOMAS (Vice-chairman, East Ham Executive Council) agreed that in the case of antibiotics there was something to be set on the credit side. These preparations had enabled the family doctor to treat many patients in their own homes at a fraction of the cost of hospitalization. There was an appalling waste in out-patient departments in some hospitals. In assessing the general practitioner's liability, one might bear in mind the consultant who ordered various substances of nutrient value which were not prescribable by the general practitioner, who, however, might have to face an inquiry and possible surcharge, when it would be no excuse for him to say that they were ordered by the consultant. The increase in the price of dressings was not always borne in mind when people exclaimed at these costs; cotton-wool to-day was three times the price it was in 1941.

Substitution of Equivalents

Many pharmacists and clerks to executive councils made suggestions for economies in drugs and dressings. It was stated that in London during the last complete year over 20 million prescriptions were dispensed at an average cost of about 4s. During the five years since the Act came into operation no doctors in London had been brought before the executive council and fined for excessive prescribing. Mr. A. G. SHORT (President of the Guild of Public Pharmacists) urged that some method be adopted for stopping the continuing use of antibiotics in cases in which they were no longer effective. The pharmaceutical department in hospitals should be given authority to substitute official drugs when they were equivalent to the proprietaries named. Much economy could be effected in dressings. Gauze, dear and difficult to obtain, need not be used when small swabs would do the job just as efficiently.

Dr. TALBOT ROGERS said that the doctor in general practice never knew whether in his endeavour to give good service to his patients he was keeping in step with his colleagues. It was not fair to compare prescribing in different parts of the country—the prescribing of a doctor in a Lancashire town, for example, with that of a doctor in a Hampshire village—but it was a good thing to compare the prescribing of doctors in adjacent streets, as was done under National Health Insurance. Dr. A. BEAUCHAMP urged that the student should be taught not only pharmacology but also prescribing, which was not at all the same thing.

Mr. HANBURY, in reply, took exception to the suggestion that the pharmacist should take authority unto himself to substitute a non-proprietary for a proprietary. Many equivalents were only reputedly so. The tone of the discussion, he added, had been all in favour of intelligent co-operation between doctors and pharmacists. The latter were nowadays very well informed and trained people. He protested against a suggestion that the wireless could help in removing mistaken ideas about drugs; it was more likely to encourage hypochondriacs.

Use of Medical Manpower

One session was devoted to the question whether manpower was used to the best advantage. The discussion turned largely on nursing and domestic service in hospitals. Sir ZACHARY COPE spoke of medical manpower—a difficult problem, he said, because of the strongly individualistic character of the profession. Under the old voluntary hospital system consultants were not paid and it was necessary for them to get a fair connexion often at hospitals separated by considerable distances. That system had been inherited by the N.H.S., but it was not essential, and manpower would be saved if in future, when appointments were made to various hospitals, there was close scrutiny of where in relation to the hospital the physician or surgeon proposed to live. Another suggestion was that in various

parts of the country where there were clinics close together covering the same field such clinics should in future be combined.

On the question of whole-time service, Sir Zachary Cope said that they all recognized that some posts were well fitted for whole-time occupancy and some men were well adapted for that form of work. Each regional board should be prepared to sanction, in consultation with the medical committee, whole-time employment in particular cases. Finally, the new service involved a good deal of committee work, which consumed valuable time. Men in consultant practice should be released from this for their clinical duties so far as possible.

Medical Planning in the Regions

Sir FREDERICK MESSER (Chairman, Central Health Services Council) pleaded for a National Health and Welfare Board, somewhat on the lines of his own council, to have overall responsibility for the administration of the service instead of the Ministry of Health. Hospital regions should be reduced in size, and regions should conform to the boundaries of groups of local authorities.

Dr. T. LLOYD HUGHES (Liverpool Regional Hospital Board) said that the regional plan had enabled rationalization and an effective redistribution of specialist and consultant services to take place, so that each area had its proportion of specialist services, though certain essential developments had been prevented by the restriction on allocation of capital. The problem of junior hospital medical staff called for much thought. Advances in technique required more junior staff to carry out the various procedures, but with the pre-registration year and the two years' National Service the young medical officers were not as ready to go back to hospital as in the past.

Dr. T. A. MORRISON (Chairman, Brighton Executive Council) said that, although the general practitioner had been called the first line of defence, this was only lip-service, and in fact he had become more and more a purveyor of prescriptions and certificates and less and less a clinician and adviser. Out of this ruck the doctor must be raised, and the Ministry, the regional board, and the local health authority must be prepared to help him. The general practitioner should have a bigger stake in the hospital service. Clinical assistantships were not the complete answer; they did not furnish the line of continuity from home through hospital and back home again. Interchangeability between registrars and general practitioners merited consideration. This would admit the general practitioner to the hospital service and ensure that the specialist had early experience of general medicine.

Sir ALLEN DALEY (late Chief Medical Officer, L.C.C.) said that regional boards were too few and too big, and there were too many executive councils and local health authorities in each region. The fact that there were only 14 regional boards was due to the supposed necessity of having a teaching hospital within each region. But there could be association between non-teaching hospitals and regional boards without a teaching hospital within the boundary. The original White Paper and the Willink proposals presumed 40 regional boards, and this would make it possible, except in Greater London, to ensure non-interference with county boundaries.

THE "NATIONAL FORMULARY"

The Joint Formulary Committee has considered criticisms of the arrangement of the *National Formulary*, 1952, received from medical and pharmaceutical organizations and from individual members of both professions, and has decided to revert, in the next edition, to the arrangement used in the *National Formulary*, 1949. Abbreviated Latin titles will be used as the main titles for individual preparations; full Latin titles will not be included. The Committee is investigating a proposal that a limited edition should be published using a pharmacological and therapeutic arrangement.

DOMICILIARY PHYSIOTHERAPY

The Physical Medicine Group Committee at a recent meeting discussed domiciliary physiotherapy and had the benefit of representatives from the General Medical Services Committee to express the point of view of the general practitioner.

Domiciliary physiotherapy presents several difficulties, and the cost appears to be one of the most serious; there is also a scarcity of physiotherapists available for the work. Because of the time spent in travelling when a physiotherapist visits the patient's home, it is more economical and convenient to bring the patient to a centre where all equipment is available. There are certain conditions, however, which prevent patients from attending at a hospital clinic, and for these treatment in the home may be essential. Another factor mentioned was the inability of mothers to leave young children while they attended at a hospital for perhaps several hours twice or three times a week.

Again the early treatment of conditions such as "lumbago" may shorten the illness considerably, whereas the arrangements for attendance at hospital necessarily impose some delay before treatment can be started. The general practitioner, too, is anxious to supervise his own cases, and by sending a patient to a hospital he may lose touch with the case.

It was thought that domiciliary physiotherapy would help to relieve overworked physical medicine departments, and a domiciliary van or vans might be equipped instead of extending such departments. Cost would have to be considered, though this would offset in some measure the number of ambulances or cars required for taking patients to hospital for physiotherapy. It was mentioned that in many towns there are private physiotherapists who could be employed by hospitals for domiciliary work, and also that voluntary effort and the assistance of bodies such as the Red Cross would supplement official arrangements.

It was agreed that the supervision of cases would have to be considered so that treatment should not go on indefinitely. To prevent this the domiciliary service could be linked to a physiotherapy department and the consultant in charge see all cases at intervals.

Another point raised was that some patients are unable to attend physiotherapy departments at the stated times, and for them, if evening clinics could not be provided, a domiciliary service might be possible.

It was generally agreed that general practitioners should have access to physical medicine departments, and if this were the custom the general practitioner could make the necessary arrangements for the domiciliary service of his patients in need.

The position was summarized by the conclusion that domiciliary physiotherapy was highly desirable and in many places appeared to be absolutely necessary, though it was recognized that the provision of such a service was not practical at the present time. Meanwhile the following lines could well be explored in various localities:

The use of private physiotherapists, perhaps with some subsidy from private and voluntary organizations.

Wherever possible, particularly in rural areas, there should be an extension of the present arrangements whereby vans equipped with necessary apparatus are provided.

The possibility of evening clinics should be explored, and also access by general practitioners to physical medicine departments.

In conclusion, it was emphasized that the number of cases for which domiciliary physiotherapy is essential is relatively small. Unless this is appreciated, the opportunity of making progress in this connexion might be lost for fear of the expense.

Registrars' Group, Scottish Western Region.—An extraordinary general meeting will be held on Friday, November 13, at 7.30 p.m. in the Lister Lecture Theatre, Glasgow Royal Infirmary.

BROMLEY DIVISION DINNER

MR. MACMILLAN ON DEBT TO DOCTORS

We all owed a debt to the profession, not only as doctors but as family friends, said Mr. HAROLD MACMILLAN, Minister of Housing and Local Government, at a dinner of the Bromley Division on October 28. Proposing the toast of the B.M.A., he said that, as an amateur, he had probably a greater knowledge of doctoring than most men. From his experience in hospitals since the first world war he could compare old methods with new, and it was quite a pleasure to have an operation these days. The doctors' work was more than a profession, it was a service, he said, and we had come to rely on their great tradition. The politicians were still mucking about with them, but the doctors carried on with the highest standards of professional conduct without worrying about it.

The chairman, Dr. H. J. PARISH, welcomed the Minister and his wife, and the secretary, Dr. J. W. EWART PURVES, replied to the toast of the Association. The Association at Bromley, he said, was made up of all political ideals, but they all welcomed the man who had the gift of understanding his constituents.

Notes and News

Hospital Costing.—The Minister of Health has set up a working party to devise a system of hospital costing based on departments and services. The system could be used to supplement the existing subjective accounts system of dividing expenditure under such headings as salaries and wages, drugs and dressings, and provisions. His decision follows consideration of comments received from hospital bodies on the "Reports on Hospital Costing" prepared by the King Edward's Hospital Fund for London, the Nuffield Provincial Hospitals Trust, and a subcommittee appointed by the committee of regional hospital board treasurers. The Minister considers that, while it is not practicable at present to replace the present subjective accounts system by one based on the departments and services of a hospital, a system of departmental and unit costing (supplementary to the subjective analysis of expenditure in the accounts), in at any rate the larger hospitals, would be of value to hospital administration and would facilitate efficient and economical spending. The working party includes representatives of the Ministry, the administrative and financial officers of the various types of hospital authorities, the King's Fund, and the Nuffield Trust. It will suggest to what types and sizes of hospital the system it recommends should apply and will be free to suggest different systems for different types and sizes.

Exchange of Hospitality.—A French surgeon's son, aged 16, at present at school in London, would like to receive occasional hospitality at week-ends, and possibly during the Christmas or Easter holidays, from a medical, preferably Catholic, family in London, and in return an English boy or girl could stay during the summer holiday either at the French surgeon's home in the Vendée or at his summer house on the Brittany coast.

A French doctor's daughter, aged 20, would like to receive hospitality from a British medical family and in return could teach French and help look after children. She has had some experience with children, for she is one of a large family and has been a cub mistress for the past three years.

Anyone interested should communicate with Dr. H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence

Care of the Tuberculous

SIR,—The above section of the report of the General Practice Review Committee (*Supplement*, September 26, p. 103), even though collected in July, 1951, appears to show a lack of information among principals of the present-day set-up of chest diseases in the N.H.S. The "tuberculosis officer" as such has in most regional hospital board areas been replaced by the chest physician. This is not a mere change of name, but implies a widening of the latter's work to include all types of chest diseases. Chest physicians are of various grades, from part-time and full-time chest consultants, S.H.M.O.s, and assistant chest physicians. At least two regional boards still appoint "tuberculosis physicians" of S.H.M.O. status to work under chest consultants.

All these grades are appointed and remunerated by the regional boards, and not the borough or county councils, although they undertake care and prevention work which is still in the N.H.S. the responsibility of the local authorities, in the same way that these authorities are responsible for the aftercare work of any patient once they leave hospital, whatever the disease.

The chest physician is available for domiciliary consultations in the same manner as any other specialist, on request, but the care of the patient in the home is primarily the responsibility of the family doctor. The criticism that "the tuberculosis officer rarely visits the patients" is a relic of the pre-1948 days, when some practitioners appeared to pass all responsibility to the now defunct tuberculosis officer.

For those patients who are unfit to attend the chest clinic, it is the practitioner's responsibility to request a domiciliary consultation if he wishes to have further guidance. There is no division of responsibility: the primary care of the tuberculous in the home lies with the practitioner. That practitioner who declared that "far too many cases clutter up the visiting list" is not carrying out his terms of service under the N.H.S.

As to the bed position, the position has improved out of all recognition within the past two years. In my hospital area, whereas the waiting-list was nine months in 1951, it is now two to three weeks. The treatment of patients in huts is now obsolete because of the better rehousing programme.

The criticism of the "dilatory easy-going attitude" to the problem by the public health department, etc., and the "great time lag" in putting into effect treatment is a misstatement, as the public health department has no longer any concern with treatment, which is the responsibility of the regional hospital boards.

Many R.H.B.s have now completed their rearrangements of their chest services, although in isolated instances these are not yet complete. Their chest physicians run out-patient clinics either in hospitals or in isolated clinics, which in time will be removed to within the structure of the hospitals—at least that is the modern tendency. Health visitors or tuberculosis visitors are still employed by the local authorities and attend the various chest clinics so that they can have a link-up with their work in the homes.

Most chest clinics, especially those within hospitals, are no longer "tuberculosis dispensaries" but deal with all types of chest diseases, and many chest consultants have their own beds in general hospitals for the treatment of non-tuberculous chest diseases.

I hope this will clear up some of the erroneous statements expressed in this section of the report.—I am, etc.,

Worthing.

E. W. THOMPSON EVANS.

Service Recruitment

SIR,—There are three problems in the recruitment of medical officers. First is the recruitment of the long-service medical officer, whose prime duty must be to maintain the administrative and training establishment. The second is to ensure that wherever he may be serving the Serviceman can have readily available the professional care and skill at least equal to that obtainable in civil life. The third is the military training of National Service medical officers, not

merely in military medicine, but also in the practice of command and training of troops.

Potential recruits for long-service commissions are basically of two types: the soldier with a medical qualification and the doctor who is also interested in the Services. Provided the remuneration is reasonable the former will always serve. The latter will never do so unless they have failed to make the grade in civil life.

Dealing as it does almost entirely with the young, fit, adult male, the scope of general and specialist practice is severely restricted. Even in civil life a population of about 75,000 is the minimum upon which a worthwhile consultant practice can be based, and in the peacetime Services even a community of 250,000 would hardly produce work of a corresponding professional interest. Military considerations would never allow concentrations of that order. Only in a few specialties such as tropical medicine, hygiene, and bacteriology can the Services hope to offer a career of absorbing interest. Too many National Service medical officers fail to realize why Parliament has put them into uniform. It is not so that they can engage in medical practice but so that they can become properly trained officers and subsequently competent members of the reserve Army. The kernel of the problem is that of providing medical care for the Serviceman in peace. At present training and administration is suffering from the fact that far too high a proportion of regular officers are being trained as specialists and the military training of National Service medical officers is suffering.

There is only one solution, and even though it is unpleasant it is a fact which I think must be faced. To-day we have largely a citizen as opposed to a professional army and a National Health Service. It is logical, therefore, to make the responsibility for medical care of the Serviceman in peacetime the responsibility of the Ministry of Health, and this must apply to troops based both at home and overseas. The ordinary National Service of the medical officer could then be cut down to a year's military training immediately after registration, and thereafter any registered medical practitioner working in the Health Service would be liable for further professional duties with the armed Forces. This would probably work out at something like a further year's service between the ages of 40 and 45. In this way the ordinary medical care of troops would not only be looked after by experienced general practitioners but the Services would have the valuable skill of the established consultant.—I am, etc.,

GUY RIGBY-JONES.

London, W.1.

SIR,—I have read Dr. L. C. Kreeger's letter (*Supplement*, October 24, p. 178). The attitude to Army life expressed in it shocks me.

Surely the highest form of service we can give our country is membership of her armed Forces. Not for nothing did the old Romans, who kept the peace—peace, mark you, Sir—in the world for five hundred years use the word *miles* as either "soldier" or "man."

Dr. Kreeger complains of "lack of professional status" and of doing non-medical work. Can he not see that a soldier's duty is to serve, not to get? An M.O. in the Army is privileged to do his National Service as a commissioned officer from the start. How can he complain if he is paid the compliment of being given work to do to which other officers have but painfully acquired the right after service in the ranks? This is a matter for self-compliment, not for complaint.

Too many M.O.s think that National Service, or regular service, are means to their own personal ends alone, that the Army is lucky to have these demi-gods in it. Service in a Service means subordination of one's self to the good of that Service, and, as Jacob found after wrestling with a disguised angel, in the end one is blest. An M.O. must be a better doctor, first and a doctor second. He will then be a better doctor because his one aim will be the good of his men because they are his men, and he will know how to achieve this and combine it with the advancements of that Service of which he and they are alike members.—I am, etc.,

C. LIFFE.

Richmond, Yorks.

Quality in General Practice

SIR,—After reading some of the recent correspondence in the *British Medical Journal* under the titles "Quality in General Practice" and "Sweated Doctors," I realize how fortunate I was to qualify in 1930 and not in 1950. As a house-surgeon in 1930-1, I was better off financially than the house-officer of to-day, allowing for the great difference in the cost of living and income tax, and the fact that my job was "all found" and that there were legitimate extras to supplement my salary.

It surely must be admitted that more knowledge is required of the young doctor to-day. The medical course is longer and more extensive, and he must have a practical knowledge of techniques little used, or as yet undiscovered, when I qualified. There are, of course, good and bad among the house-officers of to-day as there always have been, but I must admit that I have been favourably impressed by the knowledge and ability of some of the recent and relatively recent graduates with whom I have worked, and I have been glad to learn many things from them.

I feel a very real sympathy for the young doctor to-day. If he aspires to the specialties or general medicine or surgery, examinations which are virtually competitive and of increasing complexity and difficulty await him. Then if, despite having acquired the necessary higher qualifications, there are not sufficient vacancies available, he turns to general practice, he is liable to be rejected by committees, not because he is too poorly but because he is too highly qualified. Is this why we are exporting so many of our promising young doctors? If so, can we afford to lose them?

When I qualified I am grateful to remember that these committees had not yet been invented and one could go into practice where one chose and stand or fall on one's own merits. Britain was then free.

Dr. C. J. Gordon Taylor (*Supplement*, October 24, p. 179) particularly mentions the M.R.C.P. This extremely difficult examination requires a very sound and detailed knowledge of medicine and allied subjects, and, though the G.P. also has to practise the other branches of his profession, surely a profound knowledge of medicine should still be considered a good practitioner's most essential asset. A doctor possessing sufficient intelligence and perseverance to pass this examination—and these are qualities much needed in practice—should have little difficulty in bringing his knowledge of the other branches of his profession up to the not too exacting standards necessary to-day when specialist and hospital assistance are so ready to hand. And in any case an intelligent and keen man will not be content to remain inadequate in any branch of practice. Has a sound knowledge of medicine ceased to be considered the hallmark of good practice? I hope not.

It is surely a shortsighted policy to refuse admission to general practice to men with higher qualifications. The standards of general practice can hardly be said to have risen since 1948 and one doubts if the new College of General Practitioners will save the day—the suggested requirements for membership of this college give one little reason to hope.—I am, etc.,

London, W.1.

DONALD J. C. DAWSON.

SIR,—I disagree entirely with Dr. C. J. Gordon Taylor (*Supplement*, October 24, p. 179). First and foremost, it is essential in any branch of medicine to be a good diagnostician. It is equally important for the physician to diagnose an acute appendicitis or a perforated peptic ulcer or a ruptured ectopic as it is for a surgeon to diagnose or to suspect a lobar pneumonia, coronary thrombosis, or impending diabetic coma. Moreover, some of us have had to take the M.R.C.P. from general practice while doing obstetrics and minor surgery.

No, Sir, the reason why M.R.C.P.s cannot enter general practice is because there are not sufficient practices available. It is high time that there was more co-operation among us all in all branches of medicine. There should be more consultant posts, a better future for the registrar, and a lowering of the maximum lists, with a corresponding

crease in the capitation fee, so as to allow more doctors to enter general practice. Then and only then will you get an efficient National Health Service.

I feel the consultants are underpaid for their sessions considering their experience, qualifications, and number of patients to see or operate upon, but the position of the senior registrar is scandalous.

I have no axe to grind, but it is time we G.P.s thought a little about our other colleagues.—I am, etc.,

W. Harrow, Middlesex.

D. V. MORGAN-JONES.

Association Notices

CHANGE OF NAME OF BRIGHTON DIVISION

Notice is hereby given by the Council of the Association that the name of the Brighton Division of the Sussex Branch has been changed to Brighton and Mid-Sussex.

A. MACRAE,
Secretary.

NORTHERN RHODESIA BRANCH

Notice is hereby given by the Council to all concerned that it is proposed to reconstitute the existing Northern Rhodesia Branch, which has no Divisions, into one with two Divisions with the following titles and areas:

(a) Northern Division, comprising the Western Province with the districts of Kawambwa and Fort Rosebery.

(b) Southern Division, comprising the Northern Province (excluding the districts of Kawambwa and Fort Rosebery), and the Eastern, Central, Southern, and Barotse Provinces.

Any member affected by this proposal and objecting thereto should write to the Secretary of the Association by Monday, December 14, 1953.

A. MACRAE,
Secretary.

Diary of Central Meetings

NOVEMBER

9 Mon.	Registrars Executive Committee, 2 p.m.
10 Tues.	Distribution Subcommittee, Medical War Relief Fund Committee, 11.30 a.m.
10 Tues.	Building Committee, 2 p.m.
11 Wed.	Joint Subcommittee of General Medical Services and Public Health Committees on Health Visitors, 10.30 a.m.
11 Wed.	Psychological Medicine Group Committee, 2 p.m.
11 Wed.	Consultants and General Practitioners Liaison Committee, 2 p.m.
12 Thurs.	Amending Acts Committee, 2 p.m.
13 Fri.	Public Health Committee, Special Meeting, 10.30 a.m.
13 Fri.	Staff Side Medical Whitley Council, 3.45 p.m.
17 Tues.	Arrangements Committee (Toronto, 1955), 11 a.m.
17 Tues.	Medical War Relief Fund Committee, 12.30 p.m.
17 Tues.	Subcommittee on Admission of Students to Medical Schools, 2 p.m.
18 Wed.	Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.

Branch and Division Meetings to be Held

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Queens Drive, Blackpool, Wednesday, November 11, 7.15 p.m., dinner; 8.30 p.m., Dr. S. F. Gilbert: "Hypnosis in Medicine."

BOLTON DIVISION.—At Gymnasium, Bolton Royal Infirmary, Tuesday, November 10, 8.30 p.m., film show. Sound and colour films: (1) "Special Problems in Peptic Ulcer"; (2) "Radiography of the Vertebrae."

BROMLEY DIVISION.—At the Bell Hotel, Bromley, Thursday, November 12, address by Dr. W. Hedgcock (Assistant Secretary, B.M.A.).

BURTON-ON-TRENT DIVISION.—At Bretby Golf Club, Ashby Road, Burton-on-Trent, Tuesday, November 10, 7.45 p.m., dinner; lecture by Dr. F. E. Camps: "Death in Rillington Place."

CHESTERFIELD DIVISION.—At Walton Sanatorium, Chesterfield, Friday, November 13, 8.45 p.m., meeting. Presidential Address by Dr. R. B. Knowles: "Some Illustrations of Contact Dermatitis."

CITY DIVISION.—At Finsbury Health Centre, Pine Street, E.C., Tuesday, November 10, 8.30 p.m., meeting. Mr. J. Vincent O'Sullivan: "Dysmenorrhoea."

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, November 10, 8.30 p.m., general meeting. Address by Mr. A. York Mason: "Some Aspects of the Surgical Treatment of Peptic Ulceration."

DONCASTER DIVISION.—At Messrs. Parkinsons' Café, High Street, Doncaster, Tuesday, November 10, 7.30 p.m., joint meeting with Doncaster Medical Society. Dinner, followed by Address by Dr. H. L. Settle: "The Work of a Health Department."

DUDLEY DIVISION.—At Education Offices, St. James' Road, Dudley, Tuesday, November 10, 9 p.m., annual general meeting.

EAST HERTS DIVISION.—At Hertford County Hospital, Thursday, November 12, 8.30 p.m., clinical meeting. Members of Hertford Medical Society are invited.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, November 12, 7.30 p.m., dinner; 8.45 p.m., Dr. A. R. French: "Medico-Legal Problems."

EAST YORKSHIRE BRANCH.—At Quern House, Hull, Wednesday, November 11, 8.30 p.m., meeting. Dr. A. W. D. Leishman: "Treatment of the Cardiac Case in General Practice."

ENFIELD AND POTTERS BAR DIVISION.—At Chase Farm Hospital, The Ridgeway, Enfield, Friday, November 13, 8.30 p.m., meeting. Debate.

GRIMSBY DIVISION.—At Scartho Road Infirmary, Grimsby, Thursday, November 12, 8.30 p.m., clinical meeting. Professor W. H. McMenemey: "The Laboratory and the G.P." All members of the profession are invited.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, November 12, 8.30 p.m., Dr. C. C. Chesterman: "Tropical Diseases to be Expected in Troops from Korea" (with film).

HASTINGS DIVISION.—At Royal East Sussex Hospital, Hastings, Tuesday, November 10, 8.15 p.m., meeting. Address by Dr. K. Shirley Smith: "Practical Problems of Cardiac Infarction with Special Reference to the Treatment of Shock" (illustrated by slides).

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, November 10, 8.45 p.m., meeting; Dr. W. S. C. Cope: "Modern Treatment of Rheumatism."

KENSINGTON AND HAMMERSMITH DIVISION.—At Hammersmith Hospital, Duane Road, W., Wednesday, November 11, 2 p.m., ward visits for general practitioners.

KESTEVEN DIVISION.—At White Hart Hotel, Sleaford, Thursday, November 12, 7 for 7.30 p.m., dinner; 8.30 p.m., Address by Dr. E. Grey Turner (Assistant Secretary, B.M.A.): "Quacks and Quackery."

KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital, Wolverton Avenue, Kingston-on-Thames, Tuesday, November 10, 7.30 p.m., clinical meeting.

LEIGH DIVISION.—At Courts Hotel, Church Street, Leigh, Tuesday, November 10, 8.30 p.m., annual general meeting. Address by Dr. A. McNair Aitken: "Some Medical Aspects of Atomic Bombs."

NORTH BEDFORDSHIRE DIVISION.—At Bedford General Hospital, Bedford, Wednesday, November 11, 8.30 p.m., joint clinical meeting with Bedford Medical Society.

NORTH MIDDLESEX DIVISION.—At Highlands Hospital, Winchmore Hill, N., Tuesday, November 10, 2.30 p.m., clinical meeting.

READING DIVISION.—At Royal Berkshire Hospital, Reading, Wednesday, November 11, 8.30 p.m., meeting. Discussion on the personal and professional relationships between doctors—"Bridging The Gulf." Introductory speakers, Dr. J. J. Kempton, Dr. W. G. Tait, Dr. E. Hughes, and Mr. G. T. W. Cashell.

ROCHDALE DIVISION.—At Kingsway Hotel, Rochdale, Monday, November 9, 8.30 p.m., clinical meeting. Dr. N. J. de Ville Mather: "Present Views on Schizophrenia."

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, November 12, 8.30 p.m., joint meeting with Scarborough Law Society. Professor C. J. Polson: "Poisons and Homicidal Poisoning."

SOUTH ESSEX DIVISION.—(1) At Oldchurch Hospital, Romford, Friday, November 6, 9 p.m., meeting. Dr. A. Topping: "Medical Profession—A House Divided." (2) At Hyde Park Hotel, London, S.W., Thursday, November 12, 7.30 p.m. to 1 a.m., dinner dance.

SUNDERLAND DIVISION.—(1) At Royal Infirmary, Sunderland, Thursday, November 12, 3 p.m., meeting. Annual address by Professor Charles F. W. Illingworth: "The Peptic Ulcer." (2) At Seaburn Hotel, Sunderland, 7.30 p.m., annual dinner.

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, November 13, 3 p.m., clinical meeting.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Tuesday, November 10, 8.30 p.m., clinical meeting. Dr. MacDonald Critchley: "Nervous Disorders."

WEST HERTS DIVISION.—At Leavesden Hospital, Abbots Langley, Sunday, November 15, 10.30 a.m., clinical demonstration. All medical practitioners in the area of the Division will be welcome.

WEST MIDDLESEX DIVISION.—At Bryon Hotel, Ruislip Road, Greenford, Saturday, November 14, 8 to 12 p.m., Divisional dance.

WOOLWICH DIVISION.—At Woolwich Memorial Hospital, Shooters Hill, London, S.E., Tuesday, November 10, 8.30 p.m., meeting. Dr. P. H. Addison: "Medico-Legal Problems in Private and Consultant Practice." Members of the Greenwich and Deptford Division and other local medical practitioners are invited.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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British Medical Association

PROCEEDINGS OF COUNCIL

Wednesday, November 4

A meeting of the Council of the Association was held at B.M.A. House, London, on November 4, with Dr. E. A. GREGG in the chair.

Preliminary Business

The CHAIRMAN referred with regret to the death of two former Presidents, Sir Ewen Maclean, of Cardiff, and Mr. R. G. Hogarth, of Nottingham, as well as other former members of Council. He said that it was invidious to make a distinction between one person and another; they all in their own places, and according to their gifts and talents, contributed to the well-being of the Association.

The members present stood in silent tribute, and the Chairman was authorized to send a letter of condolence to the relatives.

The Chairman said that the whole Council would agree with him in extending their congratulations to Dr. Guy Dain, who was present in his accustomed place, on his 83rd birthday on the morrow. He was the recipient of their appreciation and most affectionate regard.

A handsome Chinese vase was on view before the Council. The gift of Dr. J. A. Ireland, of Shrewsbury. The thanks of the Council were extended to the donor.

The Chairman said that they were indebted to the President (Mr. Tudor Thomas) for representing them at the annual meeting of the Danish Medical Association and furnishing them with an admirable report; also to Dr. Talbot Rogers, who had produced a very interesting report about the meeting of the West German Medical Association, at which he had represented the Association.

It was reported that several letters had been received in appreciation of the organization of the First World Conference on Medical Education. The Chairman said that this was certainly a memorable event. There had come into his hands a letter from the Director of the Mayo Foundation: "I have never attended a meeting so beautifully organized and where every possible eventuality was anticipated."

Dr. R. P. LISTON reported on the cricket match which had taken place between the B.M.A. and the Law Society in July last and said that the Law Society had challenged the Association to a return match, which would be played on May 30 next year.

Representatives of the Association on nine outside bodies were appointed or reappointed.

A letter was read from the Bishop of Coventry, stating that it was desired to enlarge the representation (at present two members) of the British Medical Association on the Churches' Council of Healing. The Council decided to invite six members of the Association to serve in this way.

Annual Meeting Arrangements

A resolution passed by the Physical Medicine Group Committee expressing disappointment at the absence of a section in physical medicine in the programme of the Annual Meeting came before the Council. The Council decided that such a section should be arranged.

With regard to the Joint Annual Meeting at Toronto in 1955, a letter was read from Dr. T. C. Routley accepting with deep appreciation his election to the Presidency.

It was reported that the Canadian Medical Association at its Annual Session assembled in Winnipeg had accepted the invitation to a meeting jointly with the British Medical Association in England in 1959, and had invited the British Medical Association to nominate one of its members as president of the Canadian Medical Association for that year.

It was reported that the three plenary sessions at the Annual Meeting at Glasgow would be devoted to "The Problem of Sleep," "Food and Disease," and "The Problem of Pulmonary Tuberculosis To-day." The appointment of officers to the scientific sections was now complete.

The CHAIRMAN raised the question of the Annual Dinner in connexion with the Annual Meeting. He said that this had been an unsatisfactory event, alike from the point of view of attendance and the number and length of speeches. He suggested that it be considered whether the Annual Dinner should not be held earlier in the week so as to make it possible for more of the representatives who would otherwise be returning home to attend. The toast list should also be ruthlessly cut and the proceedings limited to two toasts, that of the "British Medical Association" and "Our Guests." The Council accepted the Chairman's suggestions for consideration by the Arrangements Committee.

A question arose as to the date of the Annual Representative Meeting, 1955, in which year the Annual Scientific Meeting will begin in Toronto on June 20. The Council agreed that the Annual Representative Meeting should be held in London from July 20 to 23. The alternative arrange-

On this point, Dr. TALBOT ROGERS, on behalf of the General Medical Services Committee, called attention to the membership of the Joint Formulary Committee. The primary purpose of the Committee, which was set up by the British Medical Association and the Pharmaceutical Society, was to assist general practitioners, but by reason of co-optation the membership of the Committee had become heavily overweighted on the scientific and pharmaceutical side, so that now out of its 37 members only 7 were general practitioners. The Committee had a different pattern now from what it had originally.

Professor WAYNE said that the Committee had to think of other requirements in addition to those of general practice, as the *National Formulary* was used in other branches of practice and also by pharmacists. While it might not be opportune to upset the balance on a joint committee representing many interests, he thought that a larger proportion of general practitioners might with advantage be included in the Executive Subcommittee, which was at present engaged in the work of revision.

The SECRETARY said that the appropriate course might be to ask the General Medical Services Committee to draft a revised constitution for the Joint Formulary Committee, and, if this were approved by the Council, to submit it to the Pharmaceutical Society for their comments.

Dr. W. WOOLLEY drew attention to a decision of the Joint Formulary Committee in relation to a resolution of the last Annual Representative Meeting, and, on the motion of Dr. DAIN, this was referred back for further consideration. The report was otherwise approved, and Dr. TALBOT ROGERS, on behalf of the General Medical Services Committee, accepted the Secretary's suggestion that his Committee should draft a revised constitution for the Joint Formulary Committee.

Appointment of Constitution Committee

The Council turned to the question of setting up, on the instructions of the Representative Body, an *ad hoc* Constitution Committee to take evidence, consider, and report on a reorganization of the Representative Body, and such other constitutional matters as the Council may decide. It had been also resolved at the Representative Meeting that while the Council should appoint the committee, not more than 50% of its members should be members of Council.

Dr. J. A. PRIDHAM, chairman of the Organization Committee, said that his Committee considered that a committee of 25 members, 12 from the Council and 13 others, with power to co-opt, would be reasonable. When the Council had appointed its quota, the remaining places could be filled from a panel drawn up on a regional basis. There should be not fewer than three representatives from Scotland, one from Wales, and one from Northern Ireland, whilst overseas members would be represented by the chairman of the Overseas Committee or his nominee. The four chief officers of the Association should be on the Committee *ex officio*, as well as the chairman or other representative of the Organization Committee, certain members of the Representative Body, including those who had taken an active part in the discussion on this question, honorary secretaries of Branches and Divisions, and members selected for their individual experience.

A ballot was then taken for seven members of Council, who, with the members *ex officio*, including the chairman of the Organization Committee, would make up the Council's twelve. Eleven names were suggested and the following were elected: Dr. R. G. Gibson, Dr. I. D. Grant, Dr. Frank Gray, Dr. R. Hale-White, Dr. J. G. M. Hamilton, Mr. H. H. Langston, Dr. A. Talbot Rogers.

Dr. S. WAND pointed out that the Committee was charged with the consideration not only of a reorganization of the Representative Body but of "such other constitutional matters as Council may decide." He thought the Council should decide what it wanted to refer to this committee, and this might have a bearing on the choice of the thirteen members and the manner in which they were chosen. Dr.

R. HALE-WHITE said that his impression of the discussion of this matter at the Annual Representative Meeting was that there was not felt to be any dramatic urgency about it. Indeed, the idea was that it would be a long business.

The CHAIRMAN said that at the Council meeting in January the Council would have before it a wide selection of names from which to appoint the thirteen non-Council members, and it would then be time to determine what matters should be referred to the Committee.

Consultants and Specialists

Dr. T. ROWLAND HILL, chairman of the Central Consultants and Specialists Committee, presented a report which covered the two meetings of that committee on July 30 and October 1, both of which were fully reported in the ensuing *Supplements*.

On the question of senior registrars and additional consultant posts—a matter which had exercised the Annual Representative Meeting—Dr. Hill said that the view of his Committee was that the paucity of consultant vacancies in general medicine and surgery was largely due to the fact that many senior registrars in these specialties were engaged in work of a consultant nature. The Ministry had been urged to impress upon hospital boards the necessity of reviewing their medical staffing arrangements in order to offset the reduction of senior registrar posts where necessary by the creation of additional consultant posts.

He also drew attention to the circular regarding the constitution and functions of medical advisory committees lately issued by the Ministry. The circular, which applied to boards of governors and hospital management committees, though not, unfortunately, to regional hospital boards, made it clear that the constitution of these committees rested with hospital medical staffs themselves and laid down the principle that hospital authorities should regularly seek the advice of these committees on all matters within their sphere.

Other questions which figured in the recent agenda of his Committee concerned the increase in the number of whole-time consultants, the qualifications of medical auxiliaries, the preparation of evidence for the Guillebaud Committee, the review of the gradings of S.H.M.O.s, hospital junior staffing difficulties, and comments on several resolutions of the recent Annual Representative Meeting. The Committee had included a whole-time consultant among the six representatives whom it appointed to the Joint Committee.

A number of questions were asked on the report, particularly concerning the registrar position and also the review of S.H.M.O. grading. With regard to this latter, Dr. L. A. GIBBONS called attention to anomalies of grading. In the north-west region all those who had come up for further review were upgraded, and in the north-east none were upgraded. What were the criteria whereby these people were made consultants? Dr. T. W. DAVIES said that if senior registrars were doing the work of consultants they should be paid as such.

Dr. HILL said that continuous pressure had been exercised by the Joint Committee upon the Ministry of Health with a view to stimulating the boards to expand their consultant services. Much of the trouble, he thought, was due to local circumstances, not to central policy. As regards the correction of faulty S.H.M.O. grading, the Ministry's "No" would not be taken for an answer, and the pressure would be kept up. One suggestion which the Joint Committee had been asked to pursue was that the senior registrar establishment of 960 posts, agreed in 1951, and the distribution of senior registrars among the different specialties within the agreed establishment, should be reviewed again to ensure that the senior registrar consultant ratio was satisfactory. The Joint Committee had accepted an invitation from the Ministry to nominate two physicians and two surgeons to serve on a small committee to consider applications from boards for permission to appoint additional consultants. Sir Harold Boldero, Mr. D. W. C. Northfield, Sir Arthur Porritt, and himself had been nominated, and the

committee, under the chairmanship of Dr. Godber, of the Ministry, had begun its work. If there was a good case for an increased establishment permission would be given.

Dr. GRAY called attention to a comment by the Consultants and Specialists Committee on the Representative Body resolution concerning the filling of general-practitioner vacancies. The resolution read that equal consideration should be given to practitioners who had spent several years in hospital "provided they have adequate experience in general practice." The Committee said it welcomed the resolution though it felt that the proviso detracted greatly from its value, and that the handicap at all. The handicap was that a considerable number of people from time to time went straight out of hospital into single-handed practice—large practice—with no experience of general practice whatever. Surely if, as an analogy, a man applied for a post in a psychiatric department and said he knew nothing about psychiatry but a great deal about orthopaedic surgery he would not get the post.

After some further discussion the report was approved.

Occupational Health Services

Dr. J. A. L. VAUGHAN JONES brought forward the revised memorandum on the future of occupational health services, which had been amended as a result of comments by other committees of the Association. The observations of the Society of Medical Officers of Health were also reported to the Council. The Society strongly urged that any comprehensive occupational health service should be part of the National Health Service, whereas the Committee had felt that, while there should be an administrative link with the N.H.S., full provision to meet special health needs of occupational groups was not made under the existing N.H.S. administration, and that additional arrangements, closely integrated, were necessary.

Dr. K. COWAN, chairman of the Public Health Committee, said that he was not quite clear why the Occupational Health Committee felt that the occupational health service should be part of the N.H.S. There would appear to be every advantage in such an arrangement. The occupational health service had its ramifications in industry and its relation to the health of the worker, and it seemed most desirable that all the questions relating to sickness benefit and other matters which really formed part and parcel of the N.H.S. should be not only closely integrated but in the same system of administration, particularly central. Unless there was a very substantial reason why the occupational health service should be outside, he could see every advantage in its functioning as part of the N.H.S. There might be some highly specialized parts of industry—such as industries where pneumoconiosis was prevalent—which might offer ground for special treatment, but he would have thought that even here there was no more reason why they should be outside the service than that brain surgery or thoracic surgery should be outside.

Dr. GRAY said that the proposals of the Society of Medical Officers of Health meant that the industrial medical officer should be under the M.O.H. That would take them into party politics. It would be, in effect, nationalizing a part of party politics. It would mean, "You cannot have your own doctor, you have got to take the doctor of the local health authority."

Dr. H. D. CHALKE said that there was no suggestion of party politics. The whole idea of having the service within the N.H.S. would be free choice of doctor, because most of the work would be done not by the medical officer of health but by the general practitioner.

Dr. VAUGHAN JONES said that his Committee felt that the occupational health service was not expanding as it should. No action had been taken by the Ministry of Labour to set up the standing joint advisory committee recommended in the report of the Dale Committee on Industrial Health Services. It had been learned, however, that the Ministry of Labour would be willing to receive suggestions from the

Association, and that was the reason why the document was going in the first instance to that Ministry. Whatever Dr. Cowan or Dr. Chalke might say, the position had not yet arrived at which they wanted the industrial health service taken over by the public health authority. That was his Committee's view and his own. At this stage it was unwise, having in mind the political issue, that the service should become part of the N.H.S. It was also impracticable to have free choice of doctor in industry. Apart from that, the occupational health service had not grown on a voluntary basis; a certain amount of statutory basis was necessary for its development, but that basis should not be the National Health Service, in which it might be completely submerged.

A certain amount of discussion on detailed matters in the memorandum took place. Dr. WAND called attention to a certain lack of clarity at one point in the proposals for general health services to workers. Exception was taken to the proposal under "certain general health services" to have diagnostic or periodic general health examinations in addition to the examination of individual workers with a view to advising management as to their conditions of employment, and a proposal by Dr. W. E. DORNAN to add to the title, after "certain general health services to workers," the words "subject always to strict observance of the ethical rules of the profession," was rejected. Objection was also taken to another paragraph which was concerned with the method of appointing industrial medical officers.

After further discussion it was agreed on the motion of Dr. GRANT, seconded by Dr. HUTCHINSON, to leave it to Dr. Vaughan Jones, in consultation with Dr. Wand and others, to make such alterations in the wording as might seem necessary in accordance with the discussion which had taken place, and, subject to this, the report was approved.

Other Committee Reports

Dr. TALBOT ROGERS presented the report of the General Medical Services Committee, which covered matters discussed at three meetings reported in the *Supplements* of August 1 (p. 69), October 3 (p. 157), and October 24 (p. 176). The report was approved without discussion.

Dr. K. COWAN presented the report of the Public Health Committee, the proceedings of which were recorded in the *Supplement* of September 19 (p. 101). This report also was approved without discussion.

Dr. H. H. D. SUTHERLAND said that the last meeting of the Amending Acts Committee was devoted almost entirely to the consideration of the memorandum of evidence to be given to the Guillebaud Committee. The Committee had still to consider some matters of long-term policy.

The Science Committee report, which was adopted, was concerned with storage space for the library, and with recommendations for the award of the Association prizes. It was agreed that the Science Committee be asked for its observations on a programme which had been sent to the Association for the celebration of the Columbia University bicentenary.

Dr. I. D. GRANT presented the report of the Private Practice Committee. This covered matters set out in the report of the Committee in the *Supplement* of October 24 (p. 175). A recommendation that an improved car badge be produced for sale to members at 10s. each, including postage and packing, was adopted.

Dr. G. DAIN presented the report of the Public Relations Committee, which dealt with formal business; also the report of the War Memorial Committee, which proposed that the £330 donated up to the present specifically for charitable purposes should be transferred to the Medical War Relief Fund, with a request that it be used to assist in the education of children of medical practitioners, victims of the second world war who were in need of such assistance.

Reports of the Journal Committee and the Family Doctor Committee were adopted without discussion. In presenting the Scottish Committee report Dr. J. G. M. HAMILTON

referred to the highly successful jubilee dinner of the Scottish Committee, and said how gratified they had been by the presence of the President, the Chairmen of Council and of the Representative Body, and the Secretary.

Other committee reports received were from the Rehabilitation of Disabled Persons Committee, which is preparing evidence for submission to the Departmental Committee; the Joint Committee with the Magistrates' Association, which is preparing a report on the whole subject of cruelty to and neglect of children; the Building Committee, which concerned exterior and interior decorations at B.M.A. House and renewal of tenants' leases, and the Office Committee, which dealt with staff matters. Dr. L. W. JONES, in presenting the report of the Welsh Committee, said that it had decided to recommend to the Amending Acts Committee that a Medical Practices Committee for Wales should be established. They were not satisfied with having only one representative accorded to Wales.

Dr. R. FORBES, for the Central Ethical Committee, said that it had been decided to send a further communication to the few Divisions and Branches which had not yet adopted the revised ethical rules approved by the Representative Body in 1950. Another matter which was before the Committee was the compilation, in conjunction with the Public Relations Committee, of a list of the various matters which might be discussed with the new Press Council. This arose out of the resolution of the Annual Representative Meeting deploring the paragraphs which sometimes appeared in the gossip columns of the Press concerning estimated incomes of prominent medical men.

The International Relations Committee report dealt, *inter alia*, with the question of subscriptions to the World Medical Association. The question of aid for South Korean doctors was brought forward, and it was left to the International Relations Committee to make some proposal to the Council. Dr. H. M. GOLDING reported for the Charities Committee.

Other Business

Dr. S. WAND brought forward a proposal that the Council should consider the desirability of setting up as soon as might be practicable a Committee on Medical Education, particularly with reference to postgraduate teaching and to the suggestions made at the recent Hague Assembly of the World Medical Association. The Council deferred its decision on this proposal.

The memoranda of evidence submitted on behalf of the Council to the Tynwald Commission on salaries and emoluments in the Isle of Man were before the Council. It was stated that as yet no conclusions could be reported, but the CHAIRMAN OF COUNCIL said how much they and their colleagues in the Isle of Man were indebted to the Secretary of the Association for his prompt action in the matter, and also to Dr. Talbot Rogers for accompanying the deputation at very short notice.

Dr. Hale-White was appointed fraternal delegate to the meeting of the Canadian Medical Association next year, and two public health service members on the Council (Drs. Chalke and Cowan) were appointed delegates to the Congress of the Royal Sanitary Institute at Scarborough next year.

The Council elected 165 new members of the Association. The proceedings terminated at 6.45 p.m.

CHEMICALS THAT CAN BE PRESCRIBED

Diagnostic reagents which the Minister of Health has decided are chemicals that may be prescribed were listed in the *Supplement* of October 17 (p. 170). The method of the prescription is for a Form E.C.10, together with the receipted bill from the chemist supplying the reagent, to be sent by the doctor concerned direct to the executive council of the area, which will then refund to the doctor the cost of the reagent.

MEDICAL PRACTICES COMMITTEE

AMENDMENT OF CLASSIFICATION OF AREAS

The following amendments to the classification of areas have been issued by the Medical Practices Committee (August 2 to October 16, 1953).

ENGLAND: COUNTIES

Bedfordshire.—Woburn, Toddington, Amphill and Cranfield District, Intermediate from *Designated.

Buckinghamshire.—High Wycombe, Intermediate from *Designated.

Essex.—Borough of Chingford, Borough of Leyton, Rural District of Rochford, Intermediate from *Designated; Urban District of Frinton and Walton, Restricted from Intermediate.

Gloucester County and City.—Hanham, Kingswood and Warmley, Intermediate from *Designated.

Lancashire.—Middleton, Stretford, Intermediate from *Designated.

Lincolnshire (Lindsey).—Caistor Area: Urban District of Market Rasen, Restricted from Intermediate.

London.—Borough of Hampstead: West End Ward, Restricted from Intermediate. Borough of Westminster: Victoria Ward, Intermediate from *Designated.

Middlesex.—Borough of Hendon: West Hendon Ward, Intermediate from *Designated.

Northumberland.—Urban District of Bedlingtonshire, Intermediate from *Designated.

Notts County and City.—Arnold District, Beeston District, Intermediate from *Designated.

Salop.—Shrewsbury, Intermediate from *Designated.

Surrey.—Borough of Sutton and Cheam, *Designated from Intermediate.

Yorks (West Riding).—Urban District of Featherstone, Intermediate from *Designated.

COUNTY BOROUGHES

Halifax.—Whole of County Borough, Intermediate from *Designated.

Liverpool.—District No. 8, Intermediate from *Designated.

Southend-on-Sea.—Southend-on-Sea and Thorpe Bay District, Intermediate from *Designated.

Stoke-on-Trent.—Smallthorne and Norton, Intermediate from *Designated.

Wakefield.—Whole of the County Borough, Intermediate from *Designated.

West Hartlepool.—Whole of County Borough, Intermediate from *Designated.

WALES

Caernarvonshire.—Borough of Conway and Llandudno Junction, Restricted from Intermediate.

Merionethshire.—Corwen, Intermediate from Restricted.

OPHTHALMIC GROUP COMMITTEE

The Ophthalmic Group Committee held its first meeting of the new session on October 9 and reappointed Mr. O. GAYER MORGAN to the chair. Mr. Morgan was also reappointed the Group Committee's representative on the Central Consultants and Specialists Committee.

Three new members were welcomed to the Committee—namely, Mr. H. V. Ingram and Mr. E. F. King, appointed by the Faculty of Ophthalmologists, and Dr. A. F. Gilbert, elected by the non-members of the Group who are on the central ophthalmic list.

"Reminders"

The Committee considered the use of reminders in the supplementary ophthalmic service—that is, written communications sent to patients for the purpose of arranging a further sight test. In the Committee's view such communications are most undesirable and result in unnecessary frequency of sight-testing and expenditure of public funds. Representations have from time to time been made to the Ministry that such reminders should be prohibited, and the

*Areas in which the position is finely balanced and the admission of only one or two doctors may result in reclassification.

matter is now under consideration by the Standing Ophthalmic Advisory Committee of the Central Health Services Council.

Bifocals

Difficulty has sometimes been caused by the Ministry's requirement that bifocals shall be prescribed only when "clinically necessary." In the Committee's view this expression is not an appropriate one, since more often than not patients need bifocals for other than strictly clinical reasons. The Ministry has been requested to introduce some phrase which will leave it to the prescriber to decide whether bifocals are essential for the patient.

Sight-testing in Sanatoria

The Committee considered the position of an ophthalmic surgeon who had been asked to test the sight of patients in sanatoria under a clause in his contract which required him to undertake occasional visits to other hospitals without additional remuneration. In the Committee's opinion it is important to maintain the principle of a medical sight-test, and if an ophthalmic surgeon who receives a request of this kind finds difficulty in meeting it he should ask for an additional session to be included in his contract. Alternatively, he might explore the possibility of delegating the work to a clinical assistant.

Clinical Instruction of Opticians

From time to time inquiries are received from ophthalmologists on the Committee's attitude to the subject of instructing opticians and student opticians. The Committee has always held the view that it is most undesirable for ophthalmologists personally to undertake this work except in the case of opticians who are employed whole-time in the hospital service.

Salaries of Dispensing Opticians

Recently the Group Committee drew the Ministry's attention to the difficulty of securing dispensing opticians in the hospital service owing to inadequate salary scales. The Ministry has replied that the Management Side of the Optical Whitley Council has made it clear that it is unable to agree to any increase in the current scale itself, unless an investigation is undertaken and evidence can be shown that the present scale is out of line with remuneration now being earned by opticians outside the Health Service or by comparable kinds of staff inside and outside the Service.

Contact Lens Centres

In view of the widening scope of contact lens centres the Central Ethical Committee has sought the Group Committee's views on the running of these centres, and a representative of the Group Committee will attend a meeting of the Central Ethical Committee to discuss the matter.

The Group Committee has decided to seek the views of the Ministry on the question of the provision of ophthalmic services at health centres, and has also appointed a sub-committee to consider the matter. Other questions which the Committee intends to raise with the Ministry include the attendance of observers from ophthalmic services committees at executive council meetings, and the prescription of glasses in the case of persons referred to the hospital service.

The Committee wishes to call the attention of general practitioners and local medical committees respectively to the two matters dealt with in the following paragraphs:

OPHTHALMIC REPRESENTATION ON LOCAL MEDICAL COMMITTEES

The Minister of Health has made regulations (S.I. No. 1177, 1953) which provide for the removal of the name of an ophthalmic medical practitioner or ophthalmic optician from a local ophthalmic list in certain circum-

stances—for example, where the person concerned has ceased to provide supplementary ophthalmic services in the area.

Before an ophthalmic services committee takes such action it is required to consult the local medical committee, and the Ophthalmic Group Committee of the Association feels that the local medical committee may wish to co-opt an ophthalmic representative when considering a proposal for the removal of an ophthalmic medical practitioner from the list.

It is therefore suggested that a local medical committee in these circumstances should communicate with the Secretary of the Association, who will arrange for a nomination to be forwarded.

"DIRECTION" BY GENERAL PRACTITIONERS OF PATIENTS NEEDING A SIGHT TEST

The criticism is sometimes made that a general practitioner who, when issuing a Form O.S.C.1, gives a patient the name of a particular ophthalmic medical practitioner or ophthalmic optician is directing the patient to that individual for his sight test, thus overriding the principle of freedom of choice. This shows a misunderstanding of the position.

The regulations contain nothing to prevent a general medical practitioner from supplying a patient with the name and address of an ophthalmic medical practitioner or ophthalmic optician, and there is no objection to his doing so, provided nothing is said that might seem to override the clear statement in the note on the back of Form O.S.C.1 that the patient has a free choice in selecting the person who is to test his sight.

As a result of representations made by the Group Committee the Ministry has recently made the position clear to executive councils in an official circular, E.C.L. 66/53.

The Committee wishes to suggest to general practitioners that the patient's Form O.S.C.1 should never be put in a sealed envelope with the form or envelope endorsed with the name of an ophthalmic practitioner or optician, since this could with some justification give rise to a complaint that the patient had been deprived of freedom of choice because he would not be able to read the notes on the form.

Overseas News

Salary Dispute with Cyprus

The Colonial Office has announced that the Secretary of State has agreed to arrange for the visit to Cyprus of an expert to examine the salary structure of the Government service and to advise whether any measure of reorganization is called for, and whether there are any anomalies or inequities which should be removed having regard to the responsibilities borne by Government officers and to the social and economic conditions prevailing in Cyprus at the present time.

The Overseas Committee has welcomed this announcement, but after careful consideration has decided that it makes no material change in the circumstances which obliged the Association to include the Government of Cyprus in the Important Notice in May, 1953. For the present, therefore, Cyprus continues to be included in the Important Notice.

East Africa Salaries Commission

A commission to examine Civil Service salaries and conditions of service in East Africa under the chairmanship of Sir David Lidbury has recently taken evidence in East Africa, including evidence submitted by the Uganda Branch. A further memorandum of evidence will now be submitted to the Commission in London by the Overseas Committee.

Testimonials for Former Colonial Medical Officers

Some time ago the Association represented to the Colonial Office that former members of the Colonial Medical Service

should be permitted to give the names of Directors of Medical Services under whom they had served as personal referees to whom any prospective employer might refer direct for a personal and confidential opinion. Previously, in many Colonies, the Director of Medical Services was permitted to furnish a testimonial for one of his ex-officers only through the Chief Secretary or Colonial Secretary, and this tended to restrict such testimonials to short and formal reports.

The Colonial Office accepted the Association's suggestion and recommended it to Colonial Governments, and it has now been learned that all Colonial Governments have adopted it.

Amendment of Medical Registration Ordinance in Hong Kong

The Hong Kong Government has recently made an amendment to the Medical Registration Ordinance of the Colony. It empowers the Governor to grant permission to doctors holding medical qualifications which do not entitle them to be registered in Hong Kong to practise medicine within a limited field—that is, to examine prospective immigrants to foreign countries on behalf of the governments of those countries. The amendment was drafted without any prior consultation with either the Hong Kong Branch of the B.M.A. or the Colony's Chinese Medical Association, and without consulting the Hong Kong Medical Board, which is the registration authority for the Colony. A strong protest against this arbitrary procedure has been sent to the Colonial Office.

Correspondence

Bureaucratic Hierarchy

SIR,—I have been following with interest your correspondence on "Sweated Doctors" and "Quality in Medical Practice," but feel that your correspondents have overlooked a most important point—namely, that of the status of the doctor under the National Health Service.

I embarked on the study of medicine at the comparatively late age of 28. As well as being then a highly trained and competent shipowner's secretary I had read widely and had broad interests, mainly in the field of adult education, and had no difficulty in passing the University Entrance Board Examination in a very short time, and therefore came somewhere near the requirements for the "ideal" medical student. It meant hard work and considerable financial sacrifice, but I felt that the satisfying vocation and rise in professional status would be ample compensation.

My first house job was in the month of October, 1948, before the machinery of the National Health Service had been properly set in motion. Though house-officers were paid less than the maids who cleaned our rooms, dimness of future prospects was not yet so apparent, and we were quite happy in the job. Two years later, after my fourth house job, and during which time the creaking wheels of the State-controlled Health Service were beginning to turn slowly and the present atmosphere of apathy, anxiety, and frustration was making itself felt in the house-officers' mess, I decided to satisfy another ambition to travel as far and wide as possible to see for myself what other lands were like and how the people lived. I have been singularly fortunate. My travels so far have taken me to Malaya, Indonesia, China, Japan, and Australia. In all these countries, as Dr. Ian D. Grant (*Supplement*, October 24, p. 173) says of New Zealand, "the doctor occupies an honourable and influential position in the life of the community," and "the status of the general practitioner is high."

Now after almost two years' absence I return to find that the wheels of the State-controlled Health Service are in full motion, but unlike New Zealand, which also has a national health service, the Health Service here is under complete

domination of the administrative bureaucracy. The status of the doctor, whether he be junior house-officer, consultant, or general practitioner, has been lowered till he is merely another Civil Servant of comparatively low rank. In hospital I am surrounded by clerks whose work I could do in my spare time and who are better paid in many cases. In reply to Dr. Harold E. Thorn's latest letter (*Supplement*, October 31, p. 185), the time he spent giving intravenous infusions is now taken up in filling up the innumerable forms demanded by the Health Service. It is much more important now that forms, etc., be completed and sent to the office before 10.30 a.m. on the day of a patient's discharge than that necessary clinical work be attended to.

It would seem that this bureaucratic hierarchy with its waste of time and material is an inevitable feature of State control of any industry or profession, but what a pity it had to happen to medicine.—I am, etc.,

Glasgow.

JESSIE M. LINDSAY.

Sweated Doctors

SIR,—Under the old regime doctors and nurses worked very long hours for very little money as a matter of professional religion. The young doctor was free to plan his own life after qualification. Nowadays he must take up house appointments by legal compulsion, having no say whatever in his long hours of highly skilled and responsible work, nor in his pay. This is forced labour, and nothing else, by which the State mans its hospitals. In any decent country the hours should be halved, or, if doctors just do not exist, the present salary doubled as overtime. I am surprised the B.M.A. or Medical Practitioners' Union has not done something to reduce these very long hours of duty. Scattered up and down the country the house-men are not organized, and only the strong representation of the whole profession can help them. It is no good saying, "It's always been a twenty-four-hour-a-day job. This is 1953, when all men expect some leisure."—I am, etc.,

Shrewsbury.

ALBERT E. NICHOLLS.

SIR,—Like Dr. Thorn (*Supplement*, October 3, p. 161) I am under the impression that the present generation in all walks of life are less interested in their work and more concerned with holidays, free time, and pay than we used to be, but it is quite possible that our seniors thought the same about us. I was on the resident staff of three hospitals more than 30 years ago in which the conditions varied very greatly. In my teaching hospital we received our board and lodging and £20 at the end of the quarter, paid with a large Bank-of-England cheque. As there was a large resident staff, the work was not heavy, and personally I remember having a considerable amount of leisure. In the second, this time a non-teaching hospital in the London area, I was paid £150 a year, with board and lodging. The food was abominable, but we were by no means overworked and had most Saturday and Sunday afternoons free. In the third hospital, in Wales, we were paid £200 to £250 a year. In addition, some of us received upwards of £100 a year as medical officer to the V.D. clinic, and about £50 a year on medical reports for patients, and an equal amount for assisting our chiefs with private patients at nursing-homes.

In those days we did not pay income tax on our board and lodging, as present residents have to do. The food was excellent, but the work was extremely hard, including a great deal of casualty work, for which we had no casualty officer. There were, I think, 10 honorary anaesthetists, none of whom ever appeared at the hospital, so we had to share the anaesthetics between us, and we often had to anaesthetize for eight to ten hours in a day. Our chiefs usually left all emergency operations to us, and sometimes we had to deputize for them in the routine operations. I remember calculating that we worked, on an average, 80 to 90 hours a week, and a hard day's work was often followed by almost the entire night spent in the operating theatre. The work was interesting; we had a great deal of experience, but one had an uncomfortable feeling that one would never catch up with one's work.

Nov. 14, 1953

CORRESPONDENCE

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Undoubtedly we were well paid, and the income tax was negligible, and we were able to save much of our pay, especially as we had not time to spend it. Our white coats were provided, and we had a free pass on the local railway and free admission to the local theatre and music hall, but we rarely had time to avail ourselves of these. None of us ever had a free week-end or a day off, and I was 18 months there before two of us thought of applying for a holiday to visit our parents abroad. This was granted after some opposition from some members of the board.

From what I hear, in most hospitals now the residents have a fair share of time off, with frequent free week-ends. I do not grudge them this. It is all to the good that conditions should improve. One of my sons, who is a house-surgeon at the present time, tells me that he finds his work very hard and leisure almost non-existent. It is hard to generalize.—I am, etc.,

Rainham, Kent.

W. U. DESMOND LONGFORD.

Grading of S.H.M.O.s

SIR,—Since the publication of the Minister of Health's decision not to admit the recognition of any cases of hardship to, or unfair grading of, S.H.M.O.s (*Supplement*, October 17, p. 167), I have received a letter from a constituent of mine which I consider justifies the reopening of the whole subject.

To begin with, the very idea of grading should never have been accepted by our negotiators at the inception of the Service. It is both hurtful and harmful to the individuals concerned, and also literally degrading to the whole profession. My constituent is one who has had higher qualifications in a specialty for eight years, and has practised this specialty for fourteen years, and is recognized by hospital colleagues, general practitioners, and the public as a consultant in that special branch of medicine. Further, more this practitioner holds a senior post at a hospital, classified as a consultant post. This is one example of many where there is gross injustice, not only in medical status, but also financially. (And in these days this must not be forgotten when S.H.M.O.s are often working as hard as and bearing the same or similar responsibilities as their colleagues of superior rank.)

It should be made plain to the Minister, the profession, and the public that all medical men and women who are duly qualified and registered, and so recognized by the law of the land, are of the same identical status, and that a few only are more eminent than others. I urge all S.H.M.O.s to take this matter up with their members of Council, with their Representatives, and with the Central Consultants and Specialists Committee. I urge them to promote a series of strong motions from their Divisions to the Representative Body, and to unite and work together.

If all this does not move the Minister to act justly in our affairs through the machinery and prestige of the B.M.A. and the Joint Committee, then Members of Parliament must be instructed to ask, and persist in asking, questions of the Minister on the floor of the House of Commons. (All Ministers hate questions which concern injustice to individuals or possible personal hardship.) This problem of S.H.M.O.s is just one of the many injustices in this Act. All must and will in time be righted by continued and determined effort.—I am, etc.,

Reading, Berks.

S. F. LOGAN DAHNE,
Member of Council for
Berks, Bucks, Oxon, and Northants.

Consultant Appointments

SIR,—You report in the *Supplement* of October 10 (p. 163) that the Ministry has been again urged by the Central Consultants and Specialists Committee to advise boards to offer candidates for consultant appointments an option for whole-time or part-time service, and that where such an option is offered candidates should not be asked for their preference at the time of interview, as this might appear to be prejudicial to those who had expressed a preference for part-time service. The expression of a preference for whole-

time service might also be prejudicial to a candidate. The financial conditions for whole-time service are so inferior to those for part-time service that the selection of whole-time conditions by a candidate might be thought to show indifference to enlightened self-interest to a degree that might be a disadvantage to his social group.

There is another point in connexion with the recommendation of the Consultants Committee that should be carefully considered. Presumably a board willing to appoint a whole-time consultant has a need for service amounting to a nominal eleven sessions, and if someone is appointed for, say, nine sessions there will be a deficiency for which the appointment of another consultant will be required. No doubt the advice given to the Minister seems reasonable to the committee, but will it be thought to make for good administration by an economist who has been appointed "to suggest means, whether by modification in organization or otherwise, of ensuring the most effective control and efficient use of such Exchequer funds as may be made available"?—I am, etc.,

Liverpool.

HENRY H. MACWILLIAM.

Cost of Practice Premises

SIR,—We general practitioners have been asked to improve our surgery premises, but I feel that this problem is not being tackled at the root. Most surgeries are situated in buildings that were never intended for such use. The Inland Revenue allows practice expenses for alterations in the surgery, but if one replaces surgery premises and builds a new surgery this counts as a capital expenditure, and one cannot claim anything for it. Having received the Danckwerts award, must we bear further instructions from the powers-that-be in silence, and abide by this blatant injustice?

I received £860 as my share of the Danckwerts award, and the Inland Revenue claimed £230 as their legitimate portion. The new surgery premises cost me over £1,000. Under these terms the value of the Danckwerts award is completely lost.—I am, etc.,

Whitwell, Derbyshire.

JOSEPH MAIZEL.

£100 Vanished

SIR,—Some months ago (*Supplement*, April 4, p. 133) you kindly published a letter from me in which I pointed out that I and others in a similar position were likely to lose £100 a year owing to the Danckwerts award. I was somewhat severely blamed for this letter, but it has, alas, turned out to have been fully justified. The £100 has now vanished into the pockets of others.—I am, etc.,

Sevenoaks, Kent.

GORDON WARD.

Keeping the Patient

SIR,—The hospital doctor can scarcely be criticized for treating the casual patient who has a reasonable excuse for coming without a doctor's letter, but the question of telling him to continue to attend is a different matter. Dr. D. Goldman (*Supplement*, October 17, p. 171) gives a number of reasons for keeping the patient: might he not have added that it is easier to say, "Come again to-morrow," than to sit down and write a letter?

At hospitals generally little attention seems to be paid to the circumstances of the patient: the mother with her shopping, cooking, and washing to do; the workman, a key man perhaps; the typist, often the only one in her office; the self-employed man whose livelihood depends on his presence at his business: to all of these a day, even half a day, at hospital means more than a little inconvenience. If they are returned to their own doctor they usually have a choice of morning or evening hours, and frequently fewer attendances will be required.

I do not see why hospitals should do the work of the family doctor unless he is known to desire it. If he is in the Health Service surely it is part of his contract; if he is in private practice it is part of his bread-and-butter.—I am, etc.,

Beckenham, Kent.

W. MAXWELL PENNY.

Association Notices

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

- An Ernest Hart Memorial Scholarship of the value of £250.
A Walter Dixon Scholarship of the value of £250.

These scholarships will be awarded to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

Each scholarship is tenable for one year commencing October 1, 1954. A current scholar may apply to be re-appointed for an additional year. No scholarship may be held for more than three years. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships must be made not later than March 1, 1954, on the prescribed form, a copy of which will be supplied on application to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

Diary of Central Meetings

NOVEMBER

- 17 Tues. Arrangements Committee (Toronto, 1955), 11 a.m.
17 Tues. Medical War Relief Fund Committee, 12.30 p.m.
17 Tues. Subcommittee on Admission of Students to Medical Schools, 2 p.m.
18 Wed. Guillebaud Evidence Subcommittee, G.M.S. Committee, 2 p.m.
18 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
19 Thurs. Film Committee, 10 a.m.
19 Thurs. G.M.S. Committee, 10.30 a.m.
19 Thurs. Journal Committee, 2 p.m.
19 Thurs. Radiologists Group Committee, 2 p.m.
20 Fri. Tuberculosis and Diseases of the Chest Group Committee, 12 noon.
23 Mon. Hospital Junior Staffing Subcommittee, Central Consultants and Specialists Committee, 11.30 a.m.
23 Mon. Public and Professional Relations Subcommittee, Central Consultants and Specialists Committee, 4 p.m.
25 Wed. Rehabilitation Committee, 10.15 a.m.
26 Thurs. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
26 Thurs. Maternity Subcommittee, G.M.S. Committee, 2 p.m.
26 Thurs. Staff Side, Committee "C" Medical Whitley Council (at 14, Russell Square, London, W.C.), 2 p.m.
26 Thurs. Committee "C" Medical Whitley Council (at 14, Russell Square, London, W.C.), 3 p.m.
27 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.
27 Fri. Industrial Injuries Evidence Subcommittee, Occupational Health Committee, 2 p.m.
27 Fri. Venereologists Group Committee, 2 p.m.

DECEMBER

- 1 Tues. Staffing Committee, 11 a.m.
2 Wed. Remuneration Subcommittee, Occupational Health Committee, 10 a.m.
2 Wed. Occupational Dermatitis Subcommittee, Occupational Health Committee, 2 p.m.

Branch and Division Meetings to be Held

BIRMINGHAM DIVISION.—At 151, Great Charles Street, Birmingham, Tuesday, November 17, 8.30 p.m., meeting. Debate: "That This House is of the Opinion that the Modern Doctor is in Danger of Losing the Use of His Senses." Proposer, Dr. H. W. Donovan; opposer, Dr. J. M. Malins.

BLACKBURN DIVISION.—At White Bull Hotel, Church Street, Blackburn, Tuesday, November 17, 8.15 p.m., B.M.A. Lecture by Dr. Ffrangcon Roberts: Health and Civilization. All medical practitioners in the area of the Division are invited.

COVENTRY DIVISION.—At Gymnasium, Coventry and Warwickshire Hospital, Tuesday, November 17, 8.30 p.m., special meeting. Sir Claude H. S. Frankau: "Conditions Arising out of a State of Emergency"—(a) A short Description of the Organization of a Civil Defence Division with its Sections; (b) Medical Organization: (i) The Medical Services During a State of Emergency After an Outbreak of War. (ii) After an Attack has been Made.

GOOLE AND SELBY DIVISION.—At The Lodge, Snaith, Thursday, November 19, 7.30 p.m., meeting. Dr. S. T. Anning: "Varicose Ulceration of the Legs."

GREENWICH AND DEPTFORD DIVISION.—At Miller General Hospital, Greenwich High Road, London, S.E., Wednesday, November 18, 8.30 p.m., meeting. Mr. K. L. Wilson: "Earache, Deafness, and Discharge." Visitors are welcomed.

HYDE DIVISION.—At New Inn, Mottram Road, Hyde, Wednesday, November 18, 8.30 p.m., meeting. Dr. H. A. H. Selbourne: "The Adventures of a Medical Bibliophile."

ISLE OF WIGHT DIVISION.—At St. Mary's Hospital, Newport, Saturday, November 21, 2 p.m. to 5 p.m., and Sunday, November 22, 10 a.m. to 4 p.m., refresher course.

KENSINGTON AND HAMMERSMITH DIVISION.—At Hammersmith Hospital, Ducane Road, W., Wednesday, November 18, 2 p.m., ward visits for general practitioners.

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Macclesfield Arms Hotel, Macclesfield, Wednesday, November 18, 9 p.m., social evening.

NORTH OF ENGLAND BRANCH.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, November 19, 7.15 p.m., clinical demonstration by Mr. F. McGuckin: "Some Aspects of Deafness"; 8.45 p.m., Address by Dr. Manuel Anderson: "Beethoven and His Deafness."

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, November 17, 2.30 p.m., practitioners' round.

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, November 16, 9 p.m., meeting. Professor Victor F. Lambert: "The Significance of Hoarseness."

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, November 17, 8.30 p.m., joint meeting with Reigate, Redhill and District Branch of Pharmaceutical Society of Great Britain. Address by Mr. F. C. Wilson (Secretary of Surrey Pharmaceutical Council): "The National Health Service Problems as they Affect Both Doctors and Chemists."

ROCHDALE DIVISION.—At Turner Hall, Birch Hill Hospital, Rochdale, Thursday, November 19, 8 for 8.30 p.m., annual dinner. Members are invited to bring medical guests.

SOUTH MIDDLESEX DIVISION.—At Jersey Rooms, Red Lion Hotel, Hounslow, Thursday, November 19, 7.15 for 7.45 p.m., annual dinner dance.

SOUTH STAFFS DIVISION.—At Bell Library, Royal Hospital, Wolverhampton, Tuesday, November 17, 8 for 8.30 p.m., meeting. Dr. J. D. Powell David and Mr. E. G. Dolton: "Surgery in the Treatment of Pulmonary Tuberculosis."

SOUTHAMPTON DIVISION.—At Southampton General Hospital, Wednesday, November 18, 8 for 8.30 p.m., general meeting. Discussion to be opened by Miss G. Padfield (Superintendent Health Visitor, The William Budd Health Centre, Bristol): "The Place of the Health Visitor in the National Health Service."

SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Thursday, November 19, 9.15 p.m., meeting. Address by Dr. L. S. Potter (Assistant Secretary, B.M.A.): "The General Practitioner and the Hospital in the Future." An open discussion will follow.

SWANSEA DIVISION.—At Osborne Hotel, Swansea, Thursday, November 19, lecture by Dr. J. H. Sheldon.

WEST BROMWICH AND SMETHWICK DIVISION.—At West Bromwich and District General Hospital, Sunday, November 15, 11 a.m., annual general meeting.

WEST DERBYSHIRE DIVISION.—At Smedley's Hydro, Matlock, (1) Wednesday, November 18, 8.30 p.m., meeting. Mr. H. R. M. Richards: "Modern Trends in the Treatment of Venereal Diseases." (2) Saturday, November 21, 7 to 9 p.m., cocktail party.

WEST SOMERSET DIVISION.—At The Empire Hall, County Hotel, Taunton, Thursday, November 19, 7.45 for 8.15 p.m., second annual dinner and dance. Guests, medical and non-medical, will be welcome.

Meetings of Branches and Divisions

MATABELELAND BRANCH

A meeting was held at the hospital, Bulawayo, on July 16, 1953. With Dr. G. A. Jamieson in the chair there were 12 members present.

SOUTH-WEST ESSEX DIVISION

The Annual Dinner and Dance of the South-west Essex Division was held at Epping on October 29. Ninety members and guests attended. Dr. A. R. Fox was in the chair and he proposed the toast of the guests, to which a reply was made by Dr. J. Arthur Moody, President of the Metropolitan Counties Branch. After dinner, dancing went on until 12.30 a.m. The master of ceremonies was Mr. Charles King, of Kingford.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 28 1953

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The B.M.A. in Committee

ORGANIZATION

Of the many committees at Headquarters, the Organization Committee is the least spectacular, its work the most pedestrian. It sends no deputations to Ministers. No controversy arises on public policy arise out of its recommendations; it is concerned entirely with matters internal to the Association. Other committees may show up more prominently in the B.M.A. structure, but the Organization Committee is the homely mortar which binds the bricks together. Without it there would be loose straggling heaps but no structure.

The Organization Committee has existed ever since the momentous meeting of July 19, 1832. It may have had other names, but the word from the mediaeval Latin is as good as any. "What is organization," asked Lord Chief Justice Coleridge, "but the connexion of parts in and for the whole so that each part is, at once, both end and means?" He might have been describing the British Medical Association with its Branches and Divisions and all its local and central democratic machinery.

It is quite a small committee, which benefits the detailed job it has to do. Four of its members are elected by the Representative Body and four by the Council, with one nominated by the Overseas Committee. The chairman of the Secretaries' Conference is included in the committee for the period of his office. Small as the elected membership is, at present it covers Scotland, Yorkshire, the West and the East of England, Wales, and the southern counties. There is no representative of the Metropolitan Counties, but two of the principal officers of the Association, who are *ex officio* members of the Committee, belong to that Branch.

Safeguarding the Constitution

The Committee is concerned with maintaining the effectiveness of the Association, central, regional, and local, at home and overseas. It must be remembered that the Association did not descend from heaven as a prepared plan to be fitted on the medical profession of the country 120 years ago. It just "grew'd." It arose in different places on the initiative of doctors who had attended the inaugural meeting at Worcester or had been in correspondence with Sir Charles Hastings. Sometimes loosely organized local medical societies became Branches of the new Association. There were eight Branches by 1848, fourteen by 1852, twenty-five by the time of the Association's jubilee thirty

years later. At first they underwent a good deal of change both in name and in area. As the historian of the Association said in the centenary volume, there was "a certain amount of fermentation in the new wine of the Association before it settled down into a stable combination of elements." But gradually a common pattern was evolved. What might have been a loose grouping of medical societies became a federation. The whole of the United Kingdom was covered, and by 1877 there was one Branch overseas (Jamaica). The second overseas Branch was a territory in the news to-day—British Guiana.

With the new constitution of 1902 the Division became the primary unit, and the Branches were groups of such units. But all the units, while having their own administrative procedure and rules, were subject to the limitations deemed necessary for the co-operation of all as laid down in the articles and by-laws of the Association. It can now be said that at what is often called the periphery (as if it were almost on the outside of things, but really meaning only its local structure and functioning) the Association is as uniform as it is healthy for such a body to be.

Organization must be interpreted in the biological rather than the mechanical sense. The Association is a living thing, and its outward framework as well as its inward spirit must be adjusted continually to the changes which occur in the society it serves. To judge from a resolution passed at the last Annual Representative Meeting, it may not be long before some reshaping of the constitution has to take place, but that will not mean that the present constitution which has existed for fifty years has not served its purpose. Indeed, it has done so to a degree which its makers cannot fully have foreseen.

An Eye on the Membership

The Committee keeps a watchful eye on the membership statistics. Membership has been going up now for many years, and the chairman of the Committee has had to report on almost every occasion a new top figure, with the possible exception of a purely temporary setback following an increase in rates of subscription. One subcommittee is concerned with medical students and the newly qualified. This makes the effort to ensure that, so far as possible, along with qualification goes enlistment into the Association. The subcommittee is reinforced by representatives from the teaching centres and also by two representatives of the British Medical Students Association.

The co-ordination of the rules under which the local units work is an important task of the Organization Committee. It must make sure that there is no conflict between local rules and Association by-laws, and, so far as possible, that

there is harmony with the set of model rules. The areas of the units, the creation from time to time of new Divisions or the amalgamation of existing ones, the annual grouping of Divisions for the formation of constituencies in the Representative Body, the maintenance of liaison between Headquarters and the regional and local organization—all these are among the duties assigned to the Committee.

One of its principal subcommittees is concerned with grants to meet Branch and Division expenditure. It is the Committee's job to analyse the annual reports and accounts of Branches and Divisions, and to make any necessary representations on the use of the Association's money in accordance with the Association's constitution. The financial needs of the units have to be ascertained, and the appropriate capitation grants recommended.

One of the Committee's tasks is the supervision of new editions of two of the Association's publications. These are, first, the *Yearbook*, prepared specially for the assistance of workers for the Association both locally and centrally; and, secondly, the *Medical Practitioners' Handbook*—a most useful vade-mecum for every practitioner. Yet another is the consideration of petitions for the formation of special groups in the Association—that is to say, groups representing special branches of medicine whose practitioners are not numerous enough to ensure the representation of their views through the ordinary channels. Again, what must be one of its driest duties, it is concerned with articles and by-laws and standing orders; also, along with the Finance Committee, subscription rates.

The Association Watchdog

One anomaly in the constitution, which the Committee is at present concerned in rectifying, was revealed early in 1953 owing to the action of a number of members of the Association in requisitioning an Extraordinary General Meeting. The question arose whether any resolution of such a meeting, if approved by the Council or by subsequent referendum as required under the Articles, which was at variance with decisions of the Representative Body, could have validity. Counsel's opinion was sought on the matter. The present situation appears to be that, although it is constitutionally in order to call an Extraordinary General Meeting, yet if the object of calling the meeting concerns a matter which encroaches upon the jurisdiction of the Representative Body any resolution passed will be ineffective and will not become the policy of the Association. The Committee is now examining the relevant Articles with a view to removing the anomaly.

The Organization Committee has always been fortunate in enlisting some very able men in its service—men devoted to the interests of the Association and willing to work for it in a way which never attracted the limelight. One recalls Dr. Morton Mackenzie, of Dorking, who was its chairman for twelve years; Dr. J. C. Matthews, of Downton, who was its chairman for thirteen years; Dr. F. A. Roper, who was a member for seventeen years; and in earlier days Mr. Russell Coombe, Dr. J. W. Bone, Dr. E. R. Fothergill, Dr. A. Lyndon, and many others. Its present chairman is Dr. J. A. Pridham, of Weymouth, under whose guidance work of considerable importance to the Association is being undertaken.

PUBLIC HEALTH AND GUILLEBAUD

A meeting of the Public Health Committee of the Association was held on November 13, under the chairmanship of Dr. H. K. Cowan, when the morning and afternoon sessions were given to the consideration of the evidence to be tendered by the Association to the Guillebaud Committee. The views of the Committee will be transmitted to the Steering Committee, which will co-ordinate the conclusions of all the standing committees concerned and, in due course, submit to the Council for its approval an agreed document of evidence.

FELLOWSHIP FOR FREEDOM IN MEDICINE

ANNUAL GENERAL MEETING

The annual general meeting of the Fellowship for Freedom in Medicine was held at Caxton Hall, Westminster, on Saturday afternoon, November 21, with Lord Horder in the chair. It was preceded by meetings of lay associate members and of local secretaries.

A decrease in the membership was reported by the honorary secretary (Dr. E. C. Warner). About one-third of the names in the 1950 register were no longer there. The Fellowship, said Dr. Warner, had always recognized that a number of those who rushed to join it at the beginning gave it only a half-hearted allegiance. But more than 2,000 of the original members continued their support, and 500 new members had joined in the same period as the others had been lost, so that it was felt that they had now a more solid body of membership than before. There were 167 lay associates, and 41 local secretaries in various parts of the country. The Fellowship had shown its strength at the last Annual Representative Meeting of the British Medical Association in furthering a resolution, against opposition, calling for the consideration of some practical scheme for the optional restoration of goodwill. There were eight members of the Fellowship in the Amending Acts Committee of the Association. By meetings, newspaper correspondence, and literature the Fellowship had done much to impress the Government and the public that something better than the present National Health Service was demanded.

Dr. G. I. V. CROSBY introduced a report of the General Practitioner Hospitals Subcommittee, pointing out that the general-practitioner hospital was a much more economic proposition than the health centre, judging from the cost of Woodberry Down, which was £155,000, and out of all proportion to the services it provided. General practitioners in some parts of the country were now being asked to take on some of the work from which they were excluded in 1948.

A report of the Private Practice Subcommittee was submitted by Dr. G. M. GOODWILL, who said that inquiries at the time when the National Health Service was started showed that private practice had diminished considerably, but since then, although there had been a great decrease in private midwifery and a considerable decrease in private work amongst children, the level of private work amongst those over 40 had remained fairly steady. It was remarked that doctors in a purely private practice found it easier to keep their patients than doctors with a mixed practice.

Reform of the Service

Dr. A. C. E. BREACH then brought forward, on behalf of the Amending Acts Subcommittee, a programme of reform of health services. This contained about 24 recommendations, all of which were passed by the meeting unanimously and almost without discussion. They called for the encouragement of private practice; for moderately priced beds in private wings of hospitals and nursing-homes; for provision of facilities for opting out of the N.H.S. scheme; for the examination of the possibility of vesting N.H.S. administration in an independent body of persons of national repute, responsible only to Parliament. Another recommendation called for the repeal of Section 35 of the Acts in order to restore the optional right to buy and sell the goodwill of general practices. A permanent independent court of arbitration under the presidency of someone of the standing of a High Court judge, and accessible to either party in a dispute, was also demanded. A series of recommendations called for a certain pruning of the Minister's powers for as long as the control of the service was vested in him. It was considered also desirable further to investigate the whole question of remuneration so as to relate the doctor's income to the quality of his work. The need for steps to

facilitate and encourage the close and responsible association of general practitioners with hospitals and institutions for the elderly was the subject of another recommendation, and yet another called for the discontinuance of the provision of health centres owned and controlled by local authorities and for encouragement, by the provision of long-term loans, of the formation of group practices. The policy of the British Medical Association for reform of the disciplinary system as approved at the recent Cardiff meeting was supported. The final recommendations concerned the need for freedom of medical teaching and research from political interference.

Dr. Breach, who was warmly congratulated, said that a supplementary report on certain other matters would be forthcoming.

The meeting agreed to the formation of a committee of lay associates, and the first task referred to it was the consideration of the expediency of a campaign in the constituencies intended to bring home to Members of Parliament the need for early legislation to enable patients who made their own private arrangements for medical attendance to obtain their medicines and appliances on the same basis as N.H.S. patients.

The Chairman's Survey

LORD HORDER deferred to the end of the meeting his own brief survey, which began with a comment on what he called the Wolverhampton incident in which practitioners, who formed themselves into a roster, had come to the rescue of the services of the local hospital, and in this connexion he reminded the meeting of the remark of the then Minister of Health on the appointed day that the problem of hospital care was the apotheosis of medicine. Recently, said Lord Horder, he opened a pathological block for a large and extremely active hospital management committee. He found that the G.P.s in this area were once more working in the hospitals.

The Guillebaud Committee gave them a chance of saying again that anything which short-circuited the G.P., the man who knew, the man who had been trained, would cost the country and the patients more money and more time, with a less good result. He recalled the remark of Disraeli: "There can be no economy where there is no efficiency."

They had been dealing that afternoon, Lord Horder continued, with some of the basic principles for which the whole profession stood or used to stand. Those who spoke for the whole profession had always declared themselves against a whole-time service, but we were now told that it would not be long before a whole-time service was a *fait accompli*. Only five or six years ago it was stated from the platform of the British Medical Association, "One thing on which we will never give way is the acceptance of a whole-time salaried service," and now they were told that they were fighting a lost cause. Take such matters as the restoration of the right to buy and sell goodwill or the enablement of private patients to obtain drugs on the same basis as N.H.S. Patients. Some of those who had formerly proclaimed adherence to certain of these vital principles were now rather irritated by these reminders. Mr. John Pringle, the Public Relations Officer of the British Medical Association, writing in the *Sunday Express*, had said, "All the signs are that the public in general is thoroughly satisfied with the [National Health] Service." That was not true. It might be that 97% of the population were on doctors' lists, but how many of them had a private doctor as well, owing to the fear, as someone had expressed it, that "I know my N.H.S. doctor will not have time to look into this"?

Putting Back the Clock

"I am proud," said Lord Horder in conclusion, "to have inspired this Fellowship, but now I look on and say, 'Bless you, my children.' I believe what Sir Earle Page said recently at The Hague, 'If we destroy our medical tradition, we shall not be able to build it up again in this generation—if ever.' We have been called reactionaries.

It was said that we were putting back the clock of medicine, because we would have no part in this conveyor-belt business, but, of course, it is the others who are the reactionaries, it is they who have put back the clock. The doctors are the experts, and anyone who says that the work can be done without the expert is bound to meet failure. Not only must there be an expert, but the expert must have room to move, room to develop. The expert to-day, properly trained and keen on his job, must have room to expand: he will not be the same expert in two years' time. The art of living is the art of learning. Medicine must control itself; it cannot accept control by the State, least of all by party politicians. If the community wants the best that medicine can give the autonomy of medicine must be preserved against all comers." (Applause.)

On the motion of Dr. S. F. LOGAN DAHNE, the Executive was instructed to consider ways and means of recruiting new members from the younger members of the profession—house officers and registrars—in order to safeguard the work of the Fellowship in the future.

A warmly accorded vote of thanks to Lord Horder concluded the proceedings.

ASSAM BRANCH ANNUAL GENERAL MEETING

The annual general meeting of the Assam Branch of the British Medical Association was held at the Indian Tea Association Guest House, Cinnamara, from March 12–15, 1953. The president, Dr. W. J. Savage, was in the chair, and there were 22 members and guests present.

Dr. K. J. Dunlop was elected president for the year 1953–4, and Dr. J. P. Norman was elected hon. secretary and treasurer. In the scientific section the following papers were read: "Effects of Surfaces on Absorption of Insecticides," by Dr. A. B. Gilroy; "Pathology of Tuberculosis," by Dr. O. W. Hasselblad; "Scrub Typhus in Upper Burma," by Dr. J. P. Norman; "Burns," by Dr. G. B. Young; and "Sickle-celled Anaemias in Assam," by Dr. K. J. Dunlop. Dr. M. E. T. Burke showed a film on "Coolie Welfare," and Dr. Mary K. Berry gave a demonstration of clinical cases of leprosy at the Borbha Lepar Colony.

The meeting closed with the annual dinner, at which Mr. Eric Hannay, chairman of the Assam branch of the Indian Tea Association, and Mrs. Hannay were the guests of honour.

WAR MEMORIAL

Members visiting B.M.A. House have suffered minor inconvenience during the last six months through excavating and building operations that have been in progress in the Court of Honour. The Court itself had suffered during the course of years from a certain amount of settlement and wear which was accelerated during the war, particularly when it was used as a car park, and this necessitated its being relaid. At the same time the foundations of the War Memorial were laid in order to save additional work.

These works have now been completed, and the monumental builders are now engaged in the erection of the Memorial itself. This consists of a central fountain around which stand symbolic figures depicting Medicine's historic service to mankind. When the Memorial is complete a detailed description of the figures and their symbolism will be issued.

The sculptor is Mr. James Woodford, O.B.E., R.A., who is well known for this type of work and who recently designed the Queen's Beasts on the Coronation Annexe of Westminster Abbey. It is expected that the Memorial will be completed about the middle of next year.

HOSPITAL ENDOWMENTS

SCOTTISH COMMISSION

Under schemes which are being put forward by the Hospital Endowments Commission every hospital board of management in Scotland is to have funds, amounting to at least £2 per bed a year, to provide amenities for patients and staff, like additional furnishings and wireless sets, and other things which cannot always be charged to the National Health Service. The Commission has to make schemes for the future of the £13m. of voluntary endowments given by private individuals to hospitals in Scotland.

Where a board of management has at present no endowments or insufficient endowments, the Commission says that funds should be transferred to them from other boards in the same general area. This, the Commission holds, would be in keeping with the "spirit of the intention" of the founders of hospital endowments. It points out that the endowments were originally given to provide something which it was not at the time within the scope of a public service to provide. The original purposes of most of these endowments are now met by the Health Service, and new outlets must therefore be provided.

The chairman of the Endowments Commission is Sir Sydney Smith, until recently Regius Professor of Forensic Medicine in the University of Edinburgh and Dean of the Faculty of Medicine.

Questions Answered

Practice Expenses

Q.—Can I claim as expense for the running of my practice, for income-tax purposes, the following: (1) employment of a sitter-in twice weekly who takes all messages and contacts me by phone as necessary; I pay him a sum equivalent to £1 weekly; (2) 5s. weekly towards the upkeep of the garden in front of the house; (3) 15s. weekly towards the cleaning of my residence, where I see patients daily?

A.—(1) If the sitter-in would be provided even if he were not required to pass on telephone and other messages the expense serves both private and professional purposes, and a claim for one-half of the expense is suggested as appropriate. (2) If the patients pass through the garden to reach the consulting-room, a claim for one-half the expense of upkeep seems appropriate. (3) The total payment for cleaning of the residence should be divided in the ratio of the total cleaning to the cleaning of the part used for the practice.

Q.—May I claim income-tax relief on the following: (1) subscriptions for golf club, which I find I must join in order to help my practice; (2) the "Encyclopaedia Britannica," which I find I need for my lecturing; (3) the decoration of my surgery and waiting-room of my new house?

A.—(1) It is, of course, agreed that membership of a golf club may increase the number of patients and the income from a practice, but it is considered that it will not be possible to establish the claim to treat the club subscription—or even any material part of it—as a professional expense. The words "wholly and exclusively" in the statutory Rule do not constitute an absolute bar to the claim, but it is thought that the subscription would fall into that class of personal expenditure, such as that necessary to maintain a certain social standard and suitable personal attire, which the courts have not regarded as allowable for income-tax purposes. (2) The cost of an encyclopaedia would be regarded as capital outlay—that is, as not deductible as an expense of earning the income from lecturing. (3) The cost of decorating the surgery should be allowed unless there are special circumstances—for example, unless the premises

were in such a poor condition that the capital sum paid for them was thereby reduced or unless the cost included some structural alteration.

Car Expenses Not Covered by Allowance

Q.—As an assistant my remuneration for the last year has been £850 plus £150 car allowance. My car expenses are considerably in excess of the allowance. What income-tax rebate can I claim on this account?

A.—If the expenses "wholly, exclusively, and necessarily" incurred in the provision of a means of travelling when engaged on the work of the practice exceed the cash allowance received, the excess can be claimed as an expense for income-tax purposes. It should, however, be borne in mind that the phrase quoted above is strictly applied, so that if, for instance, the car provided is of greater power or superior grade to that required for the work, only a portion of the total expense will be allowable. A similar restriction will apply if the car is used for private as well as for professional purposes. In calculating the total expense there can be included 25% of the written-down value of the car.

Car Purchase and Budget Changes

Q.—I purchased a new car in February this year for £900; my previous car sold for £200. What allowances can I claim? Are they operative on the income-tax year 1952-3, or do they begin after April, 1953, when there were Budget changes in respect of initial allowances?

A.—As the car was purchased before the date specified in the 1953 Finance Act, no "initial allowance" is due, but the allowance for wear and tear can be claimed for 1953-4 at 25% per annum, provided that the yearly practice accounts are not made up to a date prior to the date of purchase of the car. If, for instance, the practice accounts are made up to December 31, the claim in respect of the new car will operate for 1954-5. If the sale of the former car at £200 shows that the aggregate of the given allowances for that car has been insufficient, the deficiency can be claimed as a "balancing allowance"; if the converse is the case, the amount of the excess allowable becomes liable to tax as a "balancing charge."

Notes and News

Holiday Exchanges.—Several holiday exchanges have been arranged during 1953, and if any British doctors would like to arrange such exchanges for their children with children of Continental doctors during the summer, 1954, would they please write to Dr. H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

West Germany.—A doctor in West Germany would like to arrange a holiday exchange for his daughter, aged 12, with a British doctor's daughter, of similar age, for four to five weeks during the summer, 1954. The British child could travel to Germany with the German child. Would anyone interested please communicate with Dr. H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Questions Answered.—Doctor: "Tell me now, what do you notice wrong?"

Patient: "What, with you, sir?"

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

Nov. 28, 1953

CORRESPONDENCE

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL 213

Correspondence

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

Grading of S.H.M.O.s

SIR.—Dr. S. F. Logan Dahne's letter (*Supplement*, November 14, p. 201) appeals for justice for S.H.M.O.s doing consultant work. There are many S.H.M.O.s who, while doing consultant work and enjoying the full confidence of their colleagues in general and hospital practice, are yet graded and paid as S.H.M.O.s. Those about whom I am particularly concerned are the men who have achieved consultant status and higher qualification (but not grade and pay) whilst working in general practice. I think all will agree that it is far more difficult to do this than to carry on in hospital to attain the same status. It would appear from cases within my personal knowledge that the one thing that damns a man in the eyes of a grading committee is that he has been in general practice, whereas in the minds of all sensible people he would be regarded as a great attribute to his ability.

Divisions and Branches, with great help from the Secretariat, have tried hard to remove these injustices, but they still persist. What then remains? An appeal to Parliament through the S.H.M.O.'s own M.P.—not just a question in the House but a pursuit until justice is done. However, before this is done the Central Consultants and Specialists Committee should be given until January 1, 1954, to clear up all outstanding cases. I may add that I have no personal axe to grind.—I am, etc.,

ARTHUR BEAUCHAMP.

Birmingham.

SIR.—You publish in the *Supplement* of October 17, page 167, a statement from the Ministry of Health rejecting a request for further consideration of certain S.H.M.O. gradings that the profession considers still to be unjust. This seems to call for some protest from the ground that the rejection appears to be based on the ground that the review committees were properly constituted and locally informed. The fact remains that in this country appeals are allowed from the decision of Her Majesty's judges, whose courts are presumably also properly constituted and not without experience. It seems therefore that the S.H.M.O. doctors who feel that their cases have not been thoroughly understood should have the same elementary right to present the facts for a further impartial review at a higher level. Few as these cases may be, the rights of even the smallest minorities deserve consideration.

It is indeed surprising that this announcement should have been taken with such apparent placidity by the B.M.A. and the profession as a whole: one would have expected a more vigorous reaction. Personally, I should like to see a demand that S.H.M.O. gradings, if not abolished entirely, should be reviewed every five years at least so that these men should not nurse a sense of frustration and grievance that must otherwise embitter them for life.—I am, etc.,

L. HENRY.

Cheltenham

Service Recruitment

SIR.—I, like Dr. L. C. Kreeger (*Supplement*, October 24, p. 178), am interested in the recent proposals for stimulating recruitment for the medical branches of the Services primarily by pay increases, and, again like him, feel that this latest effort will be unsuccessful.

For the last 14 years every newly qualified doctor, if fit, has had to do his service along with most other men in this country, and he has seen for himself only too clearly what Service medicine is like. In the old days a man, imagining the life would suit him, signed on without any first-hand knowledge of the conditions, and when he made his discovery it was too late. That is all changed now. The only

difference which the new rates of pay will make will be, in my opinion, to increase the bad feeling between the medical and other officers which existed under the old scheme, and of which I have personal knowledge. This, of course, is due to the fact that officers of equal seniority in the medical and other branches did not receive the same pay, and now the gap is being widened further. The resentment is perhaps justifiable.

Dr. C. Iliffe (*Supplement*, November 7, p. 191) suggests that the highest form of service we can give our country is with her armed Forces. This is arguable, but, supposing it were true, would he agree that a doctor looking after only 250 men (and in the healthiest age group at that) for four months in a destroyer which was in port nearly every night and never left the English Channel was doing all that he might for his country? My working day during that time was from 9 to 9.30 a.m. And is the training to become, "subsequently, competent members of the reserve Army" (Navy), to which Colonel G. Rigby-Jones refers in (*Supplement*, November 7, p. 191), really furthered by sitting in the wardroom doing the *Daily Telegraph* crossword and looking after the wine accounts? Every National Service medical officer that I have met has had one thought uppermost in his mind—how long is it until I am "outside" and get back to a job of work?

It is not wage increases that are needed to ensure the adequate staffing of the medical branches of the three Services, but a drastic alteration in the whole of the medical organization to enable each medical officer to have a reasonably full and satisfying day from a professional point of view.—I am, etc.,

N.S.M.O.

SIR.—Colonel Guy Rigby-Jones (*Supplement*, November 7, p. 190) has been forthright in what he considers to be the needs of the Army, but overlooks the fact that a medical training is a very valuable thing which should not be frittered away on pay parades and other non-medical duties. Further, at the outbreak of a war there is always, and always will be, a shortage of doctors, for both civilian and military needs, for purely medical purposes. I consider that it is iniquitous to train doctors for administrative duties in the Army. As regimental medical officer or hospital medical officer, not only is a young doctor doing a well worthwhile job, but he is getting an invaluable training in human values. Other duties, such as those of a static field ambulance and in administrative headquarters, are not only an unnecessary and a useless burden on him but would be better performed by non-medical personnel. I have often listened to infantry officers saying that doctors playing at soldiers is farcical. Furthermore, I have frequently found that a soldier has attached quite misplaced confidence in the medical advice and opinion of a senior R.A.M.C. officer whose only claim to seniority was service (in time) in non-medical duties, and who privately would be the first to admit that he had forgotten most of the medical knowledge with which he qualified; and yet the same patient-soldier would prefer his opinion to that of the young, recently well-qualified doctor who had much inferior rank.

The American system of having a medical administrative corps attached to the medical services and consisting entirely of non-medical personnel has much to commend it. I see no value whatever in training young doctors to take pay parades, etc. What essentials in man management are required in daily life are already inculcated in public school. Doctors are required for more important tasks.—I am, etc.,

W. J. ATKINSON.

Shortlands, Kent.

Quality in General Practice

SIR.—With reference to recent correspondence under the heading "Quality in General Practice," I would like to suggest that the reason for the unsatisfactory position of the holder of higher qualifications in general practice is to be found in the fact that such qualifications do not command any higher remunerative prospects.

After all, such qualifications are meant to confirm extra study and knowledge, and if this were recognized by some increase in remuneration—by "merit award" or otherwise

—the surplus M.R.C.P. would be in great demand in partnership practice. The practitioner with higher qualifications and necessary experience could then afford to reduce his numbers, giving a higher standard of service, and so make the entry of the unestablished practitioner less difficult.—I am, etc.,

Dundee.

R. A. B. RORIE.

Fees for Coroners' Necropsies

SIR,—In the *Supplement* of March 28 (p. 83) it was stated that the Home Office had assured the Association that it would be informed as soon as there was any possibility of legislation to amend the Act of 1926 by which the fee for a coroner's necropsy was fixed at the present level—namely, two guineas.

Parliamentary time has been found for a Bill to increase the salaries of H.M. Judges, who, unlike coroners' pathologists, have security of tenure and the right to a pension; and now time is to be found for discussing the pay of Members of Parliament, who gave themselves an increase as recently as 1948.

The B.M.A. can exert a great deal of pressure on any Government; and it appears to be essential, in the interests of fairness to a small group of its members, that this power should be used so that coroners' pathologists can be relieved of the dubious honour of being paid no more than they were receiving a quarter of a century ago.—I am, etc.,

London, W.1.

A. PINLEY.

Unwilling to Pay

SIR,—We would be glad to know if other colleagues of ours in general practice are faced with the problem of settling insurance claims after the death of the assured and how they deal with it.

We are a partnership in an industrial part of London, and it is very common in this area for insurance companies to persuade their client to take out a small policy on the life of a relative. The sum assured and the premium are usually not very large, and it is particularly stressed at the time of taking out the policy that no medical examination of the assured is required. The policy holder is merely asked to sign a statement as to the state of the health of the assured as far as they know it. When death occurs and the money is claimed, in many cases payment is refused pending a medical report upon the state of health of the deceased prior to the date upon which the policy holder signed. The next procedure usually is that a letter comes from the insurance company stating that they understand that the deceased was a patient of ours, and requesting details of medical history prior to the date of the policy. As an inducement to comply meekly with their request, a fee is often enclosed in advance.

In our experience, most of these requests are made without permission of the relatives, and, therefore, under the guise of being helpful, we are being asked to divulge confidential information to a third party, the lever being that if this information is withheld hardship is caused to the policy holder by reason of non-payment of the claim. Some of us react by returning the cheque with a firm refusal to supply any information unless there is written permission from the relatives. Others of us have taken an even stronger line and have refused to give any information at all, feeling that this should have been asked for from the assured himself before the policy was broached. We have spoken to several insurance agents about this, but have never received a satisfactory explanation.

Surely, the insurance companies cannot have it both ways. They should either accept a signed statement of the policy holder with the risk of early unexpected death, or they should insist on some form of previous medical investigation before issuing a policy.—We are, etc.,

W. B. MUMFORD.

KEITH H. GILLISON.

L. J. PAGE.

J. C. E. PESHALL.

J. ARMSTRONG.

London, S.E.16.

B.M.A. LIBRARY

The following books have been added to the Library:

- Advances in Cancer Research. Edited by Jesse P. Greenstein and Alexander Haddow. Volume 1. 1953.
- Annual Survey of Psychoanalysis. Edited by John Frosch. Volume 1—1950. 1952.
- Antibiotiques et les Maladies de l'Enfance (Antibiotics and Children's Diseases). Séminaire organisé à Paris du 22 au 27 Septembre, 1952, par le Centre International de l'Enfance. (French and English text.) 1952.
- Association for Research in Nervous and Mental Disease. Vol. XXXI. Psychiatric Treatment. 1953.
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- Barron, S. L., and Schott, A.: Cardiographic Technique. 1952.
- Baruch, D. W.: One Little Boy. 1953.
- Bell, E. M.: Storming the Citadel: The Rise of the Woman Doctor. 1953.
- Berenblum, I.: Man Against Cancer: The Story of Cancer Research. 1952.
- Blacklock, D. B., and Southwell, T.: Guide to Human Parasitology. Fifth edition revised by T. H. Davey. 1953.
- Blasi, A.: I Bronchi di Drenaggio delle Caverne Tubercolari del Polmone. 1953.
- Bodansky, M., and Bodansky, O.: Biochemistry of Disease. Second edition. 1952.
- Bonelli, L.: Aerosoli e Vie Aeree. 1953.
- Bowly, J.: Child Care and the Growth of Love. 1953.
- Bsteh, O.: Die Geschwürkrankheit des Magens und ihre chirurgischen Probleme. 2. Auflage. 1952.
- Burnett, C. W. F.: Anatomy and Physiology of Obstetrics. 1953.
- Clinical Side-Room Methods (University of Glasgow Standing Committee on Laboratory Methods). Sixth edition. 1952.
- Corner, G. W.: Attaining Manhood: A Doctor Talks to Boys About Sex. Second edition. 1953.
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- Davis, J. E.: Clinical Applications of Recreational Therapy. 1952.
- Dawber, T. R., and Hawes, L. E.: Diseases of the Chest. 1952.
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- Eden and Holland's Manual of Obstetrics. Tenth edition by Alan Brews. 1953.
- European Seminar and Lecture Course on Alcoholism. Copenhagen, October 22–November 3, 1951. 1953.
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- Feyrter, F.: Über die peripheren endokrinen (parakrinen) Drüsen des Menschen. 2. Auflage. 1953.
- Fish, E. W.: Parodontal Disease: a manual of treatment and atlas of pathology. Second edition. 1952.
- Fisher, J. T., and Hawley, L. S.: Diary of a Psychiatrist. 1952.
- Fromm-Reichmann, F.: Principles of Intensive Psychotherapy. 1953.
- Garcia, J. A.: Clinique et Pathologie de la Neurosyphilis. 1953.
- Gelfand, M.: Tropical Victory: An Account of the Influence of Medicine on the History of Southern Rhodesia, 1890–1923. 1953.
- Gervis, P.: Sierra Leone Story. 1952.
- Godlowski, Z. Z.: Enzymatic Concept of Anaphylaxis and Allergy. 1953.
- Goodwin, T. W.: Comparative Biochemistry of the Carotenoids. 1952.
- Goris, A., Liot, A., and Goris, A.: Incompatibilités Pharmaceutiques. 3me édition. 1953.
- Hart, E.: Man Born to Live: life and work of Henry Dunant, founder of the Red Cross. 1953.
- Heilbrunn, L. V.: Outline of General Physiology. Third edition. 1952.
- Hill, H.: Clean Milk. 1952.
- Hill, H., and Dodsworth, E.: Food Inspection Notes. Fourth edition. 1953.
- Hofer, H.: Das Amputiertenproblem in neuer Gestalt. 1952.
- Hollis, G. T.: Disease and its Conquest. 1953.
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- Pedersen, J.: Diabetes and Pregnancy: blood sugar of newborn infants during fasting and glucose administration. 1952.
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- Pisut, V.: Zaklady Röntgenodiagnostiky v Internej Praxi. 1952.
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- Waksman, S. A.: Neomycin. 1953.
- Walker, K.: The Healing Arts and Their Future. 1953.
- Walter, H.: La Pratique de l'Exploration Fonctionnelle du Foie. 1953.
- Wiechmann, E.: Die Zuckerkrankheit. 1953.
- Williams, H.: Conquest of Fear. 1952.
- Winterton, W. R.: Aids to Gynaecology. Eleventh edition. 1953.

- Wolff, W.: Threshold of the Abnormal: A Basic Survey of Psychopathology. 1952.
- Womack, N. A. (Editor): On Burns. 1953.
- Yellowless, H.: To Define True Madness: Commonsense Psychiatry for Lay People. 1953.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Lieutenant J. M. Cliff to be Surgeon Lieutenant-Commander.

Acting Interim Surgeon Lieutenant-Commander F. A. Lennan to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Captain G. McCoull, O.B.E., V.R.D., Q.H.P., has retired.

Surgeon Lieutenant-Commander J. H. E. Summerhill has been removed from the Active List.

Surgeon Lieutenant K. L. Marks to be Surgeon Lieutenant-Commander.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel W. S. Martin, M.C., has retired on retired pay, and has been granted the honorary rank of Brigadier.

Lieutenant-Colonel D. Cran has retired on retired pay, and has been granted the honorary rank of Colonel.

Major D. Ollivere, from Short Service Commission, to be Major.

Captain R. W. Campbell has resigned his commission and has been granted the honorary rank of Major.

Short Service Commission.—Captain J. M. Wilson to be Major.

REGULAR ARMY RESERVE OF OFFICERS

Lieutenant-General Sir Alexander Hood, G.B.E., K.C.B., late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

Major-General (Honorary Lieutenant-General) Sir T. O. Thompson, K.C.S.I., C.B., C.B.E., late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

Colonel W. C. MacKinnon, late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

ROYAL ARMY MEDICAL CORPS

Major (Acting Lieutenant-Colonel) A. D. Davidson has been granted the acting rank of Colonel.

Captain (War Substantive Major) (Honorary Lieutenant-Colonel) G. G. Smith has ceased to belong to the R.A.R.O.

Major J. A. Hamilton, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

Captain (War Substantive Major) C. E. McCausland, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, and has been granted the honorary rank of Lieutenant-Colonel.

Captain (War Substantive Major) E. H. Evans has ceased to belong to the R.A.R.O.

Captain (Honorary Major) P. J. Geoghegan has ceased to belong to the R.A.R.O.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Lieutenant (War Substantive Captain) R. B. Wilson, from Emergency Commission, to be Captain, and has been granted the acting rank of Lieutenant-Colonel.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Colonel E. A. C. Fazan, M.C., T.D., having exceeded the age limit, has retired, retaining the rank of Colonel.

The notification regarding Colonel I. G. W. Hill, C.B.E., T.D., in a *Supplement* to the *London Gazette* dated February 27, 1953, has been cancelled.

Lieutenant-Colonels J. D. Finlayson, T.D., and R. Passmore have been granted the acting rank of Colonel.

Major W. Milburn, M.B.E., has been granted the acting rank of Colonel.

Major J. B. Heycock, M.C., to be Lieutenant-Colonel.

Majors R. C. Webster, H. A. Mullen, and J. G. Waugh have been granted the acting rank of Lieutenant-Colonel.

Major G. P. Stille, from R.A.R.O., to be Major.

Major R. N. Craig, having exceeded the age limit, has retired, retaining the rank of Major.

Captains (Acting Majors) T. McCarroll, M.C., and D. W. L. Leslie to be Majors.

Captains W. A. M. Smith and C. K. Bridge to be Majors.

Captains J. W. A. Crabtree, G. G. Younie, G. A. Steele, and H. W. Truist to be acting Majors.
Lieutenant (War Substantive Captain) T. M. Pemberton, M.B.E., from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: D. W. Horn, M.B., Ch.B., D.T.M.&H., Medical Statistician, Nigeria; J. H. Ashmore, M.B., B.Ch., Medical Officer, Falkland Islands; R. K. Bowman, M.R.C.S., L.R.C.P., Medical Officer, Fiji; A. J. Cunningham, M.B., Ch.B., Medical Officer, Zanzibar; H. A. Harding, M.D., Ph.C., T. E. Jeffreys, M.R.C.S., L.R.C.P., and G. A. Phillips, M.R.C.S., L.R.C.P., Medical Officers, Federation of Malaya; Joan M. Falkner, M.B., B.Ch., Medical Officer (Temporary), Mauritius; R. J. Murray, M.R.C.S., L.R.C.P., Resident Medical Officer (Intern), Kenya; Gweneth L. O'Reilly, M.B., B.Ch., Junior Hospital Medical Officer, Leeward Islands; Yap Pow Meng, M.R.C.S., L.R.C.P., D.P.M., Specialist (Psychiatric), Hong Kong; J. M. Mees, M.D., Medical Officer, Local Civil Service, Gold Coast; R. E. Anderson, M.B., Ch.B., D.P.H., D.T.M.&H., Deputy Director of Medical Services, Federation of Malaya; L. J. Clapham, M.B., B.S., D.P.H., D.T.M.&H., Director of Medical Services, North Borneo; C. Runciman, M.B., B.Ch., Medical Officer, Tanganyika; R. H. Strudwick, M.B., Ch.B., Medical Officer, Hong Kong; L. E. Arnold, M.D., D.P.H., Bacteriologist, Jamaica; R. G. B. Bevan, M.B., Ch.B., Medical Officer, British Solomon Islands Protectorate; K. B. Bender, M.R.C.S., L.R.C.P., Government Medical Officer, British Guiana; D. Kopel, M.D., Medical Officer (V.D.), Health Department, Mauritius; J. K. M. Quartey, F.R.C.S., Medical Officer, Gold Coast.

Association Notices

Diary of Central Meetings

DECEMBER

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| 1 Tues. | Staffing Committee, 11 a.m. |
| 2 Wed. | Remuneration Subcommittee, Occupational Health Committee, 10 a.m. |
| 2 Wed. | Occupational Dermatitis Subcommittee, Occupational Health Committee, 2 p.m. |
| 3 Thurs. | Central Consultants and Specialists Committee, 10.30 a.m. |
| 8 Tues. | Rehabilitation Committee, 10.15 a.m. |
| 8 Tues. | Central Ethical Committee, 2 p.m. |
| 8 Tues. | Subcommittee on Admission of Students to Medical Schools, G.M.S. Committee, 2 p.m. |
| 9 Wed. | Executive Subcommittee, Private Practice Committee, 10.30 a.m. |
| 9 Wed. | Amending Acts Committee, 2 p.m. |
| 10 Thurs. | Central Consultants and Specialists Organization Subcommittee, 2 p.m. |
| 11 Fri. | Ophthalmic Qualifications Committee, 1.45 p.m. |
| 11 Fri. | Medical Witnesses Subcommittee, Private Practice Committee, 2 p.m. |
| 11 Fri. | Ophthalmic Group Committee, 2 p.m. |
| 11 Fri. | Public Health Committee, 2 p.m. |
| 15 Tues. | Joint Consultants Committee (at Royal College of Physicians of London, Pall Mall East, S.W.), 10.30 a.m. (Date changed from December 8.) |
| 15 Tues. | Working Party Subcommittee, Joint Consultants Committee and Ministry of Health (at Ministry of Health, 23, Savile Row, W.), 2.30 p.m. (Date changed from December 8.) |
| 16 Wed. | Occupational Health Committee, 11 a.m. |
| 16 Wed. | Office Committee, 11.15 a.m. |

JANUARY

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| 20 Wed. | Rehabilitation Committee, 10.15 a.m. |
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Branch and Division Meetings to be Held

CAMBERWELL DIVISION.—At Dulwich Hospital, East Dulwich Grove, S.E., Tuesday, December 1, 8.45 p.m., meeting. Address by Dr. J. C. M. Matheson: "Prison and Prisoners." All members of the Lambeth and Southwark and Wandsworth Divisions are invited.

CHELSEA AND FULHAM DIVISION.—At St. Stephen's Hospital, Fulham Road, London, S.W., Friday, December 4, 8.30 p.m., meeting. Lecture by Lieutenant-Colonel W. L. Harnett: "A Journey in Central Tibet." Illustrated by lantern slides.

COVENTRY DIVISION.—At G.E.C. Ballroom, Telephone Road, Binley Road, Stoke, Coventry, Thursday, December 3, 7.15 for 7.45 p.m., ladies' night.

DORSET DIVISION.—At The Clinic, Glyde Path Road, Dorchester, Thursday, December 3, 8.30 p.m., meeting. Lecture by Dr. George Crawshaw: "Collapse of the Lung in Children."

EAST HERTS DIVISION.—At Lister Hospital, Hitchin, Thursday, December 3, 8.15 p.m., clinical meeting. Dr. E. D. H. Cowen: "Diabetes, 1953"; Mr. J. J. Shipman: "The Acute Emergency"; Dr. G. H. Ritterman: "Differential Diagnosis of Certain Skin Diseases."

FINCHLEY DIVISION.—At Finchley Memorial Hospital, Bow Lane, N., Friday, December 4, 8.45 p.m., meeting. Dr. P. F. Borrie: "Dermatological Inexactitudes."

GRIMSBY DIVISION.—At The Winter Gardens, Cleethorpes, Thursday, December 3, 8 p.m. to 1 a.m., annual dinner-dance.

HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Harrow, Tuesday, December 1, 8.30 p.m., clinical meeting. Discussion to be opened by Dr. S. J. Hadfield (Assistant Secretary, B.M.A.): "A Field Survey of General Practice." Members of the Wembley Division are invited.

HASTINGS DIVISION.—At Sackville Hotel, Bexhill-on-Sea, Friday, December 4, 7.30 for 8 p.m., annual dinner and dance.

KENSINGTON AND HAMMERSMITH DIVISION.—At Hammersmith Hospital, Ducane Road, W., Wednesday, December 2, 2 p.m., ward visits for general practitioners.

KESTEVEN DIVISION.—At Grantham and Kesteven General Hospital, Grantham, Thursday, December 3, 8 p.m., meeting. Address by Dr. C. C. Bowley: "Applications of Modern Blood Group Knowledge."

LAMBETH AND SOUTHWARK DIVISION.—At Lambeth Hospital, Brook Drive, Kennington Road, S.E., Sunday, December 6, 11 a.m., clinical demonstration.

LEWISHAM DIVISION.—At Park Hospital, Hither Green, S.E., Sunday, December 6, 10.45 a.m., clinical meeting.

MANCHESTER DIVISION AND MANCHESTER LOCAL MEDICAL COMMITTEE.—At Midland Hotel, Manchester, Tuesday, December 1, 8 for 8.30 p.m., annual medical ball and dinner.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, December 1, 5 p.m., Lecture to senior students by Dr. F. E. Camps: "Wounds and Wounding," illustrated with lantern slides. All recently qualified practitioners are invited.

MID-HERTS DIVISION.—At Hammond's End Golf Club, Harpenden, Friday, December 4, 8.30 p.m. to 1 a.m., dance. Guests will be welcome.

NORTH-EAST ESSEX DIVISION.—At Nurses' Recreation Hut, Maternity Home, Lexden Road, Colchester, Tuesday, December 1, 8.15 p.m., meeting. Two films: "Radiography of the Vertebrae" and "The Medical Motion Picture."

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, December 1, 2.30 p.m., practitioners' round.

NUNEATON AND TAMWORTH DIVISION.—At Red Lion Hotel, Atherstone, Tuesday, December 1, 8 for 8.45 p.m., medico-political evening.

READING DIVISION.—Tuesday, December 1: (1) At Berkshire Club, Blagrove Street, Reading, 6.45 for 7 p.m., dinner; (2) At Large Chemistry Lecture Theatre, Reading University, 8.30 p.m., annual B.M.A. Lecture by Mr. R. Christie Brown: "Pregnancy and Labour as Instruments of Natural Selection."

ST. PANCRA'S DIVISION.—At B.M.A. House, Tavistock Square, London, W.C., Wednesday, December 2, 8.30 p.m., meeting. Dr. Joan G. Malleon: "The Menopause."

SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Thursday, December 3, 8.30 p.m., meeting. Dr. R. R. Gordon: "Present Trends in the Treatment of Children's Diseases."

SHROPSHIRE AND MID-WALES BRANCH.—At Raven Hotel, Shrewsbury, Thursday, December 3, 7.45 for 8.15 p.m., dinner followed by dancing.

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, December 4, 9 p.m., meeting. Sir John Parkinson: "Common Difficulties in Cardiology."

SWANSEA DIVISION.—At Brangwyn Hall, Swansea, Friday, December 4, B.M.A. Ball.

WEST DENBIGH AND FLINT DIVISION.—At Royal Alexandra Hospital, Rhyl, Thursday, December 3, 8 p.m., meeting. Film display—two films dealing with cardiac diseases and irregularities.

Meetings of Branches and Divisions

HAMPSTEAD DIVISION

The first meeting of the 1953 4 session was held at the Hampstead General Hospital on October 14, 1953. With Dr. Lena Williams in the chair, there were 22 members present. Mr. Hindenach spoke on "The Orthopaedic Disabilities of the Lower Limb in Childhood."

MOMBASA DIVISION

A meeting was held at the British Council premises on August 10, 1953. With Dr. Cochrane in the chair, there were over 15 members present. Dr. Lloyd Rushby gave a talk on "Recent Advances in the Treatment of Pulmonary Tuberculosis."

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. James Ross (Barnsley, Yorks) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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GENERAL MEDICAL COUNCIL

187th SESSION

The 187th session of the General Medical Council opened at the Council's offices, 44, Hallam Street, W.1, on November 24, when the chair was taken by Professor Sir David Campbell.

Mr. KEITH PATERSON BROWN, F.R.C.S.Ed., was introduced as representing the Royal College of Surgeons of Edinburgh and took his seat.

On the proposal of Dr. H. GUY DAIN the Council placed on record its special pleasure at the knighthood which Her Majesty had conferred on Sir David Campbell. Dr. Dain, who spoke on behalf of the English Branch Council, was supported by representatives of the Scottish and Irish Branch Councils, a representative of the Dental Board on the Council, one of the lay members, and the Legal Assessor. The resolution was cordially adopted and Sir David Campbell suitably replied.

PRESIDENT'S ADDRESS

Sir DAVID CAMPBELL referred first to the death in August of Norman King, a former registrar of the Council. Entering the service of the Council in 1897, he had proved himself "one of our most distinguished servants for the long period of 36 years." He retired from office in 1933.

Sir David then went on to speak of the removal from the Council as a whole of its responsibility for professional discipline by concentrating that responsibility on the smaller Disciplinary Committee. From now on the Council as a whole, except for cases reported for action by the Dental Board, would be entirely free from disciplinary business and will be able to devote its energies more effectively to the many-sided problems of medical education.

"Nevertheless," said the President, "it appeared to the Council, having regard to the great importance of the disciplinary functions entrusted to it by Parliament, that it was desirable that if at all possible every member of the Council should be afforded an opportunity of serving for a period on the Medical Disciplinary Committee or on the Penal Cases Committee." The Council would therefore be asked to approve a method of election, including a scheme of rotation, which, while preserving a degree of continuity in membership, would give each member of the Council an opportunity to serve.

The Medical Curriculum

Six years have passed since the publication of the current recommendations relating to the medical curriculum, and the President thought that the time was approaching when the Council would have to study the effects of these recommendations and consider how far it may be necessary to revise them in the light of the changing circumstances of medical practice. In making such a review, it was desirable that the Council should have before it the reports

of visitors in the various subjects of the curriculum, and especially the reports of the inspectors of the qualifying examinations. With that end in view, the Council last May had appointed visitors in the subjects of anatomy, physiology, social medicine and public health, and inspectors in the qualifying examinations in medicine, surgery, and midwifery. These same visitors and inspectors had been invited by the Medical Registration Council of Ireland to visit and inspect examinations and medical schools in the Republic. Sir David went on to say that a debate next May on the whole question of medical education, including the impact thereon of the compulsory period of house-officer appointments, would be desirable.

Approved Hospital Posts

In order to assist young graduates and hospital authorities generally the Council published last year a list of the hospitals in Great Britain and Ireland and of the posts therein approved for the time being by licensing bodies for the purpose of house-officer service under the Act of 1950. That list included 634 hospitals and 3,048 posts. Since then the Council has been informed that 53 other hospitals have been approved, while 4 included in the list have ceased to be approved. The number of recognized posts has increased to 3,232. A list setting out in detail the changes in the number of both hospitals and posts has now been issued by the Council for the guidance of all concerned.

Licensing bodies are empowered by the Act to approve for this purpose hospitals not only in this country but also in the Commonwealth and in foreign countries. For the assistance of all persons interested the Council has now issued a list showing the hospitals and institutions in Colonial territories which have been formally approved by one or more licensing bodies for an indefinite period.

Statutory Registration of Opticians

Some months ago the Minister of Health announced in Parliament that in conjunction with the Secretary of State for Scotland he was proposing to discuss with the bodies concerned the findings of the Report submitted last year by the Interdepartmental Committee on the Statutory Registration of Opticians, of which the chairman was Lord Crook. The principal recommendation was that registration of opticians should be in the hands of a General Optical Council, which would contain representatives of the medical profession, ophthalmic opticians, and dispensing opticians, together with an independent chairman and two Privy Council nominees. The medical practitioners were to include three ophthalmologists, one medical practitioner engaged in the preclinical training of students, and one general practitioner. "While it would not be fitting for me," said the President, "to comment on the wider issues involved—and it is to be noted that the Committee was instructed to proceed on the assumption that there should be a system of statutory registration of opticians—the

Association Notices

Diary of Central Meetings

DECEMBER	
8 Tues.	Committee on the Rehabilitation of Disabled Persons, 10.15 a.m.
8 Tues.	Central Ethical Committee, 2 p.m.
8 Tues.	Subcommittee on Admission of Students to Medical Schools, G.M.S. Committee, 2 p.m.
9 Wed.	Executive Subcommittee, Private Practice Committee, 10.30 a.m.
9 Wed.	Amending Acts Committee, 2 p.m.
10 Thurs.	Central Consultants and Specialists Organization Subcommittee, 2 p.m.
11 Fri.	Compensation and Superannuation Committee, 11 a.m.
11 Fri.	Medical Witnesses Subcommittee, Private Practice Committee, 2 p.m.
11 Fri.	Public Health Committee, 2 p.m.
14 Mon.	Central Consultants and Specialists Hospital Junior Staffing Subcommittee, 11.30 a.m.
15 Tues.	Joint Consultants Committee (at Royal College of Physicians of London, Pall Mall East, S.W.), 10.30 a.m. (Date changed from December 8.)
15 Tues.	Working Party Subcommittee, Joint Consultants Committee and Ministry of Health (at Ministry of Health, 23, Savile Row, W.), 2.30 p.m. (Date changed from December 8.)
16 Wed.	Occupational Health Committee, 11 a.m.
16 Wed.	Office Committee, 11.15 a.m.
16 Wed.	Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
17 Thurs.	G.M.S. Committee, 10.30 a.m.
22 Tues.	Waverley Evidence Committee, 11 a.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Aldershot Civil Infectious Diseases Hospital, Thursday, December 10, 8.30 p.m., meeting. Dr. Brian O. T. Taylor: "Carcinoma of the Lung."

BATH, BRISTOL AND SOMERSET BRANCH.—At Castle Hotel, Taunton, Thursday, December 10, 8.30 p.m., annual general meeting. Presidential Address: "A Little Peak."

BIRMINGHAM DIVISION.—At Midland Hotel, New Street, Birmingham, Saturday, December 12, 7 for 7.30 p.m., 50th Anniversary Dinner. Annual B.M.A. lecture by Sir Lionel E. H. Whitby.

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Queens Drive, Blackpool, Wednesday, December 9, 7.15 p.m., dinner: 8.30 p.m., Dr. G. W. Murray and Dr. S. C. Gawne: "The Health Visitor and the General Practitioner."

BRIGHTON AND MID-SUSSEX DIVISION.—At Royal Sussex County Hospital, Brighton, Thursday, December 10, 3 p.m., clinical meeting.

BROMLEY DIVISION.—At Royal Bell Hotel, Bromley, Thursday, December 10, 8.30 p.m., joint meeting with Bromley and District Law Society. Address by Mr. W. Bentley Purchase: "Reminiscences on Life as a Coroner and Barrister."

BURTON-ON-TRENT DIVISION.—At Bretby Golf Club, Ashby Road, Burton-on-Trent, Tuesday, December 8, 7.45 p.m., dinner, followed by lecture by Dr. Donald Stewart: "Some New Developments in the Rehabilitation and Resettlement of Disabled Persons."

CHESTERFIELD DIVISION.—At Walton Sanatorium, Chesterfield, Friday, December 11, 8.45 p.m., meeting. Dr. James Carson: "Cerebral Vascular Disease, with Special Reference to Cerebral Aneurysm."

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, December 8, 8.30 p.m., general meeting. Address by Mr. W. McKim McCullagh: "Medical Causes of Marital Unhappiness."

DUNDEE AND ANGUS DIVISIONS.—At Physiology Lecture Room, Medical School, Dundee, Friday, December 11, 8.30 p.m., meeting. Sound and Colour Film: "Special Problems in the Management of Peptic Ulcer."

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, December 10, 7.30 p.m., dinner: 8.45 p.m., Sir W. Heneage Ogilvie: "Abdominal Emergencies."

EAST YORKSHIRE BRANCH.—At Quern House, Hull, Wednesday, December 9, 8.30 p.m., meeting. Mr. N. R. Barrett: "Cardiac Surgery."

ENFIELD AND POTTERS BAR DIVISION.—At Demonstration Theatre, Eastern Gas Board Offices, Sydney Road, Enfield, Wednesday, December 9, 8.30 p.m., meeting. Medical films: (1) "The Story of Halibut Oil"; (2) "Senile Obliterative Arteritis of the Legs."

GLASGOW DIVISION.—At 234, St. Vincent Street, Glasgow, Wednesday, December 9, 8.30 p.m., meeting.

GREENWICH AND DEPTFORD DIVISION.—At Amersham Road Clinic, New Cross, S.E., Wednesday, December 9, 5.30 p.m., meeting. Dr. Ronald Hartley: "The Heart in Pregnancy." All medical practitioners in the area of the Division are invited.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, December 10, 8.30 p.m., Mr. D. N. Matthews: "Plastic Surgery."

HAMPSTEAD DIVISION.—At Hampstead General Hospital, Haverstock Hill, N.W., Wednesday, December 9, 8 p.m., clinical evening.

HASTINGS DIVISION.—At Royal East Sussex Hospital, Hastings, Tuesday, December 8, 8.15 p.m., clinical meeting.

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, December 8, 8.45 p.m., meeting. Dr. K. Shirley Smith: "Practical Problems in the Treatment of Cardiac Disease and Shock" (illustrated by lantern slides).

KENSINGTON AND HAMMERSMITH DIVISION.—At Hammersmith Hospital, Ducane Road, W., Wednesday, December 9, 2 p.m., ward visits for general practitioners.

KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital, Wolverton Avenue, Kingston-on-Thames, Tuesday, December 8, 8 for 8.30 p.m., meeting. Dr. W. S. C. Copeman: "Modern Views on the Treatment of Rheumatism."

LEIGH DIVISION.—At Courts Hotel, Church Street, Leigh, Tuesday, December 8, 8.30 p.m., meeting. Address by A. G. S. Calder: "Recent Advances in Otology."

LEWISHAM DIVISION.—At Park Hospital, Hither Green, S.E., Sunday, December 6, 10.45 a.m., meeting. Demonstration of cases by Dr. M. Laurent.

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Macclesfield Arms Hotel, Macclesfield, Thursday, December 10, 8.30 p.m., meeting. Dr. D. A. K. Black: "The Management of Oedema." A discussion will follow.

MONMOUTHSHIRE DIVISION.—At St. Mellons County Club, Monday, December 7, 8 p.m. to 2 a.m., annual dance.

NORTH MIDDLESEX DIVISION.—At Gaumont Cinema, Wood Green, N., Tuesday, December 8, 8.30 p.m., cocktail party.

PADDINGTON DIVISION.—At Paddington Town Hall, London, W., Thursday, December 10, 8.30 p.m., meeting. Film: "Modern Handling of Ankylosing Spondylitis."

SCUNTHORPE DIVISION.—At Blue Bell Hotel, Scunthorpe, Thursday, December 10, 8 for 8.30 p.m., annual dinner.

SHROPSHIRE AND MID-WALES BRANCH.—At Copthorne Hospitals, Shrewsbury, Wednesday, December 9, 8 p.m., meeting of clinical and pathological section. Discussion: "The Place of Tonsillectomy in Present-day Practice."

SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital, Luton, Friday, December 11, 9 p.m., meeting. Dr. L. Handley Ashken: "The Special Clinic—Its Uses and Usefulness." A film and slides will be shown.

SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Monday, December 7, 8.45 p.m., annual general meeting.

SOUTH-WEST ESSEX DIVISION.—At Out-patients' Department, Thorpe Coombe Maternity Hospital, Forest Road, Walthamstow, E., Wednesday, December 9, 8.30 p.m., meeting. B.M.A. lecture by Sir Zachary Cope: "The Regional Diagnosis of Acute Abdominal Disease." A discussion will follow.

SWANSEA DIVISION.—At Osborne Hotel, Swansea, Thursday, December 10, lecture by Dr. L. G. C. E. Pugh.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Tuesday, December 8, 8.30 p.m., clinical meeting. Mr. G. C. Knight: "Facial Pain."

WEST HERTS DIVISION.—At Crown Hotel, Garston, Wednesday, December 9, 8.30 for 9 p.m., general meeting. Address by Dr. S. J. Hadfield (Assistant Secretary, B.M.A.): "General Practice—a Factual Survey." A discussion will follow.

WEST MIDDLESEX DIVISION.—At Nelson Room, Ealing Town Hall, London, W., Wednesday, December 9, 8.30 p.m., meeting. Address by Dr. R. Forbes: "Litigation and the Profession."

WEST SUSSEX DIVISION.—At The Black Horse Hotel, West Street, Horsham, Thursday, December 10, 6.30 p.m., meeting. Address by Dr. H. L. Marriott: "Some Recent Advances in Diagnosis and Treatment," followed by business meeting and a discussion.

WILLESDEN DIVISION.—At Central Middlesex Hospital, Park Royal, N.W., Tuesday, December 8, 9 p.m., general meeting. Dr. F. Avery Jones will talk on his recent tour of India and Australia, illustrated by colour photographs.

WOOLWICH DIVISION.—At Brook General Hospital, Shooters Hill Road, S.E., Tuesday, December 8, 8 p.m., joint clinical meeting with Greenwich and Deptford Division.

Meetings of Branches and Divisions

BIRKENHEAD AND WIRRAL DIVISION

The annual general meeting was held at the Arrowe Park Hotel on October 31, 1953. With Dr. R. Vaughan Thomas in the chair, there were 12 members present. The following officers were elected for the coming session:

Chairman.—Dr. R. Johnson.
Vice-chairman.—Dr. R. W. L. Pearson.
Honorary Secretary and Treasurer.—Dr. H. C. W. Baker.

NORTH WALES BRANCH

The autumn meeting was held at Capel Curig, on November 5, 1953. With Dr. R. Salter Ellis in the chair, there were 14 members present. Mr. Emyln Lewis gave a lecture on plastic surgery, and a film of the operative procedure and aftercare of a case of brown pigmentation of both eyelids was shown.

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The B.M.A. in Committee

ITS PARISH THE WORLD

It is 76 years since the first Overseas Branch of the British Medical Association was formed. Since then the Association has established itself all over that aggregate of territories which owe allegiance to the Crown. The first Branch was formed in Jamaica in 1877 and afterwards there appeared a quick succession of Branches in various parts of what is now called the British Commonwealth. A South Australian Branch was formed in 1879, one in British Guiana in 1883, the first Indian Branch in 1884, Ceylon in 1887, the first African Branches in 1888, the first in the Far East in 1891, and so on. The Branches now range through the alphabet from Aden to Zanzibar. They are to be found in all the continents except North America. There are Branches in the Caribbean, in the Mediterranean, in the Malay archipelago, in Polynesia. Africa has fifteen Branches; Australia has six; New Zealand is one Branch comprising seventeen Divisions.

Originally there were Branches in Canada, the first of them in Halifax, Nova Scotia, in 1887, but since 1926 these have been dissolved on the affiliation of the Canadian Medical Association with the British Medical Association. So close is this affiliation that in 1955 and again in 1959 the two Associations will hold joint Annual Meetings, in Canada under a Canadian president and in Great Britain under a British president. In the Union of South Africa also the South African Medical Association is affiliated with the B.M.A.

The Overseas Committee

At the Annual Meeting every year the overseas representatives attending are limelighted on two or three occasions, but it is not always remembered that there is at Headquarters an Overseas Committee which for many years under one name or another (until recently the Colonies and Dependencies Committee) has zealously looked after the interests of members of the Association abroad. The work of the Committee is mainly concerned with the Colonies and the protectorates. The corporate branches in the Dominions with their own excellent organization make little demand on Headquarters in London.

The Overseas Committee includes members who themselves have seen service overseas and have ties with the countries in which they served. They bring wisdom and experience to its deliberations. It is quite a small committee.

In addition to the four chief officers of the Association, who are members *ex officio*, it consists of seven representatives of overseas constituencies elected by the democratic machinery of the Association and holding office for three years; two members appointed by the Council; two by the Representative Body, and one by the Organization Committee; and there is power to co-opt additional members for areas not otherwise represented. The grouping of overseas constituencies for election of members to the Committee is: Australia (two members); New Zealand and Fiji; South-east Asia; Africa and the Middle East; the Caribbean; and the Irish Republic.

Varied Agenda

The agenda of a typical meeting (to take a recent example) may include consideration of disputes in Cyprus over pensionable salaries of specialists in Government employment; working conditions of the medical profession in Malta; the evidence to be given before the commission which is examining Civil Service salaries and conditions in East Africa; remuneration for medical services in certain African protectorates; the progress towards unification of Government medical services in the Caribbean; a proposal for a visit by a representative of the parent body to Branches in the Far East; a demand for new salary scales in Borneo; an amendment of the Medical Registration Ordinance in Hong Kong; the question of private practice by Government doctors in the Seychelles; security of tenure in the colonial research service, as well as such domestic matters as the method of representation of Overseas Branches in the Representative Body. All that in the programme of business for one meeting.

Occasionally a large general question will arise, such as a proposal for the formation of a Commonwealth Civil Service, but in general the business of the Committee concerns one or other of the many congeries of communities in the British Commonwealth with their various forms of government, social customs, and standards of cultures, demanding knowledge and, if possible, personal experience of the particular community. No sooner is a satisfactory adjustment made in one area than some difficulty arises in another. A question which in different forms is constantly presenting itself is whether, a medical service in some part of the colonial world being unsatisfactory, the Association, acting against its traditions, should condone it and continue to recruit doctors for it, or should blacklist it. The question of unqualified doctors in certain areas and of the sphere of those whom we in this country call medical auxiliaries comes forward in overseas territories much more acutely than it

does at home. The Committee has also to bear in mind the three Branches of the Association which are in foreign countries (Egypt, Sudan, and the Middle East), and those members abroad who are not attached to any Branch.

The chairman of the Committee for some years past has been Mr. J. L. Gilks, and its secretary is Dr. E. Grey-Turner.

International Relations Committee

The British Commonwealth is itself a great experiment in international and inter-racial relations, but in recent years the Association has increasingly developed a world consciousness. Since the war the World Medical Association has come into existence, on the foundation of a much smaller and structurally looser body, the Association Professionnelle Internationale des Médecins, of which Dr. Alfred Cox, then secretary of the Association, was one of the founders. The World Medical Association is a body of great importance to each national medical association. It costs 100,000 dollars a year to run, and has a *Bulletin* which is published four times a year in three languages.

For some years now an International Relations Committee has functioned at Headquarters under the chairmanship of Dr. J. A. Pridham. This constitutes an active link with the World Medical Association, and through it with the World Health Organization of the United Nations, arranging for attendance at assemblies abroad, participating in various international conferences, and entertaining foreign delegates when they come to this country. The International Relations Committee has also done all it can to enlist the interest of Government departments, especially the Foreign Office and the Commonwealth Relations Office, in the promotion of British medical ideas and methods abroad. The Committee, which consists in all of about twenty members, is the growing point of interest in the concerns of the medical profession in other countries where there is a common ethic and ideal, and on both sides there is much to be given and received.

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

GUILLEBAUD EVIDENCE

An all-day meeting of the Central Consultants and Specialists Committee was held on December 3, with Dr. T. Rowland Hill in the chair. A full programme of business awaited the Committee, with as many as 10 lengthy documents to consider, and 32 items on the agenda, some of which were referred for decision by the Executive.

Much time was devoted to the consideration of a draft memorandum of evidence prepared by the Chairman on the authority of the Executive for the Guillebaud Evidence Steering Committee. This was a comprehensive document dealing with the general administration of the hospital service, the medical advisory machinery, medical staffing whole- and part-time, the relation of general practitioners to hospitals, and other matters. After detailed discussion of the document, together with the views expressed by regional committees, it was generally approved.

The Executive also submitted a report on a number of matters which had been the subject of previous discussion. One of these concerned the appointment of medical members of regional hospital boards.

Consultation Fees for Government Services

The Treasury's proposals for fees for part-time services of consultants in various Government departments were considered, and a number of recommendations were made for increases. Notably the fees proposed by the Treasury were in some instances below the three guineas which the Committee considered to be the minimum for a consultant opinion.

S.H.M.O. Grading

The dissatisfaction expressed by a considerable number of S.H.M.O.s with their grading following the last review again came forward. It was the view of the Executive, confirmed by the Committee, that there was evidence to suggest that some of these practitioners had been unfairly treated and should have been given consultant status. The Ministry's attitude was set out in a letter which appeared in the *Supplement* of October 17 (p. 167). Despite the Ministry's obvious unwillingness to interfere with the decisions of the review committees, it was felt that the matter should not be dropped. It was pointed out that to some extent the injustices might have arisen out of different standards adopted by the review committees in the various regions.

Complaints Procedure

Dr. Robert Forbes, in the absence of Dr. Cochrane Shanks, the chairman of the subcommittee concerned, presented a report on complaints procedure. He reminded the Committee that doctors were called upon to provide reports, and in doing so they might well be furnishing something which would prejudice their own interests in the event of further proceedings. An earlier circular from the Ministry stated that if a doctor was responsible for an act or omission which was made the basis of litigation the Ministry or the regional board or management committee should seek to serve a notice of contribution on him, calling upon him to contribute towards any damages or costs that might follow. The Ministry was, so to speak, bringing in the doctor as a third party. In reply to a protest on this point, the Ministry had asked what would be the attitude of the profession if in future it changed its policy and did not seek to obtain such a contribution. This new situation had been discussed with representatives of the Ministry, who had been warned of the possibility that if the current policy were continued doctors might be unwilling to prepare adequate clinical notes, lest by so doing they prejudiced their own interests. It was therefore imperative to devise some machinery enabling medical staff to co-operate with their employing authorities by reporting accidents and other incidents which might lead to complaint without involving them in subsequent disadvantage should the matter go to litigation.

Accordingly he now submitted to the Committee a draft memorandum which was the result of consideration between the Ministry, the subcommittee, and representatives of the defence societies. It set out in detail the course which should be followed if it was decided to settle the action out of court or to defend it in court. If accepted it would mean that all concerned would have to depend on the goodwill of the others. He thought the arrangement would make for a better atmosphere between employers and employed. The draft memorandum was unanimously approved.

Liaison with General Practitioners

Another report presented was from the Consultants and General Practitioners Liaison Committee, of which Dr. Rowland Hill is chairman. One of its recommendations was that a joint subcommittee representative of the different aspects of the subject be appointed to give further study to the establishment of an integrated service for the treatment and rehabilitation of chronic disablement arising from age or illness. Dr. Talbot Rogers said that he was a member of the previous Association committee in 1949 on the care and treatment of the elderly and infirm, but the scheme it drew up was largely theoretical; some of its ideas had been put into practice, but new ideas had emerged, and the subject was ripe for further review.

It was also proposed that steps be taken to draw the attention of members of hospital medical staffs to the importance of ensuring that general practitioners were promptly notified of the death or discharge of their patients. Dr. Talbot Rogers said that it was not necessarily a long report which was required, but a simple immediate notification.

Hospital Junior Staff

A recommendation was submitted by the Hospital Junior Staffing Subcommittee, under the chairmanship of Professor G. I. Strachan, that medical recruitment committees be asked to grant to the greatest extent possible post-registration deferment of call-up for periods of up to one year; that the salary of all posts below the grade of senior registrar be increased for a period of two years where held by a practitioner who had undertaken a period of national service as a medical officer; that every effort be made to persuade hospital authorities of the urgent need to make married quarters available for junior hospital staff, and that facilities be increased and encouragement given to married women practitioners to undertake part-time employment in hospitals as casualty officers and the like.

It was stated that owing to the policy adopted by the medical schools at the request of the Government at the end of the war of admitting a high proportion of ex-Service students a large number of the students who would qualify in the next two years would not be liable for national service. This meant that for the next two years the comparatively small number of young practitioners liable for national service would make it difficult to meet the requirements of the Services and the policy would probably be to grant deferments in exceptional circumstances only.

It was agreed, after some discussion, that the whole report should at once go to the Joint Consultants Committee.

Public and Professional Relations

The Chairman mentioned that the setting up of a Public and Professional Relations Subcommittee had been the subject of a question from the Public Relations Committee of the Association, but he had made it quite clear that the new subcommittee had no executive functions but was charged solely with the task of examining and reporting to its parent committee on matters of personal concern to all members of hospital medical staffs, and that it would consult with the Public Relations Committee before embarking upon any publicity campaign.

A report from this new subcommittee was presented by its chairman, Professor P. C. P. Cloake. It contained many recommendations, including the issue of information leaflets in hospitals to give welcome, comfort, and guidance to the patient; the revival of groups of hospital friends and similar bodies; the appointment of a senior or recently retired consultant to give general supervision to the interests of patients, and certain arrangements to acquaint the press and the public with the hospitals' arrangements and problems. It was also proposed that a pamphlet be prepared and sent to all consultants, S.H.M.O.s, and registrars setting out the present organization for negotiating and conducting the affairs of hospital medical staffs, that in each region an annual meeting open to all members of medical staffs be summoned; that general practitioners be notified that at certain definite times they would be welcomed to the wards to visit their patients and to discuss the cases with members of the hospital staff available, and that social gatherings where medical staff and local general practitioners could meet be stimulated and encouraged.

A further series, not of recommendations, but of suggestions, were that when seeking to arrange out-patient appointments general practitioners should be asked to indicate those cases which they considered for medical reasons to be urgent, and that these should have priority; and that wherever practicable out-patients should be referred back to their general practitioners for intermediate treatment or supervision.

The Committee also received a letter from the Society of Medical Officers of Health referring to the widespread failure to notify cases of tuberculosis. The Committee decided to draw the attention of hospital medical staffs to this matter. Several other matters remained on the agenda, including resolutions from group and regional committees, and various business was referred to the Executive for future report.

LIFE ASSURANCE

FEE FOR "LONG" FORM

For some time information has been received suggesting that the fee for the ordinary form of medical examination report for life assurance is not considered satisfactory by many doctors. As a result of discussion of this problem at the A.R.M. this year it was resolved:

"That the fee for the long form of medical report for life assurance should be increased from £1 11s. 6d. to £2 2s."

Meeting with Life Offices

Recently representatives of the Private Practice Committee met representatives of the Life Offices Association to discuss a number of matters, including the question of this fee. It was explained that the present fee, which had been agreed in 1947, was considered inadequate for a variety of reasons and should be increased to £2 2s.

No Evidence of Dissatisfaction

After a full discussion the Life Offices Association stated that their members were unanimous in the view that a fee of £1 11s. 6d. was adequate for this service. They supported this contention by stating that they had little evidence that doctors were dissatisfied with the fee—in fact, the contrary appeared to be the case. This was reported to the Executive Subcommittee of the Private Practice Committee.

"BONUS SHIFT CERTIFICATES"

In November, 1952, the Five-day Week Agreement between the National Coal Board and the National Union of Mineworkers was extended to permit the payment of a proportionate bonus *inter alia* when a miner is absent from work on account of certified sickness. As a result of this extension the number of medical certificates required by miners from their family doctors increased, and this appeared to be mainly in respect of absence from work due to sickness where the miner had not sought examination or treatment by his doctor. In such a case the doctor is usually asked by a man who is fit for work to issue a certificate stating that he was unfit the day before. In almost all cases the doctor is unable to certify that the man was unfit for work, as there is no clinical evidence of incapacity.

No Certificate on Hearsay Evidence

From information which has reached the B.M.A. it is clear that miners often try to persuade their family doctors to issue a certificate which is only a repetition of the man's own statement. Doctors consider that they should not be asked to issue such *ipse dixit* certificates.

At the A.R.M. this year at Cardiff the matter was fully discussed, and it was resolved:

"That the Representative Body disapproves of the issuing of bonus-shift certificates to a miner, unless he has been actually attended by the doctor during his illness, and that the Council be asked to consider reopening the question with the National Coal Board."

Coal Board's Reply

Representations were made to inquire from the National Coal Board what steps could be taken to resolve these difficulties. The following reply has been received:

"With reference to your letter of November 18, the Board have recently had under consideration the arrangements for payment of proportionate bonus. The attention of the Board has been drawn to the type of certificate to which you have referred—namely, a certificate which says 'A. B. says he was unfit for work yesterday.' Such a certificate is not regarded as a medical certificate but is merely hearsay evidence. These difficulties have been discussed with the National Union of Mineworkers, who are as concerned as the Board that only cases of genuine sickness should be protected, but the Union stated that if there was abuse of the provisions it was for the Board to deal with the matter

administratively and that if they were dissatisfied with a decision of the Board it should be open to them to make representations to the Board.

"Divisions [of the National Coal Board] have been informed that the procedure should be tightened up but not so as to interfere with genuine cases. If a man who is really sick sees or calls in a doctor the following day and is still sick, a proper medical certificate covering the whole period of sickness would not be challenged. It is, in the Board's view, essential if abuse of the new provisions is to be avoided that medical certificates should only be issued where a doctor has actually examined the patient at the time of sickness and should state the nature of the incapacity which renders the man incapable of following his employment."

SOCIAL SECURITY BENEFITS RECIPROCAL ARRANGEMENTS WITH AUSTRALIA

Reciprocal arrangements on social security benefits between Great Britain and Australia will come into force on January 7, 1954. The arrangements will enable people who go from this country to Australia to receive benefits under the Australian scheme to supplement any retirement pension or widows' benefits which they may be receiving from the Ministry of Pensions and National Insurance. People who come from Australia to this country will be treated as if they had been insured under the National Insurance schemes while they were in Australia so as to help them to qualify for National Insurance benefits here.

Family Allowances

A separate agreement with Australia on family allowances will come into effect on the same day under Regulations which are being made by the Minister of Pensions and National Insurance. This will ensure that families going from one country to the other will be able to qualify for family allowances in the new country as soon as they arrive there.

LOANS ON COMPENSATION SPECIAL TERMS FOR MEMBERS

About 18 months ago the Association, with the help of the Medical Insurance Agency, initiated discussions with the Ministry of Health about the possibility of using the compensation standing to the credit of a practitioner, but not ordinarily payable until retirement, as security for a loan under a form of mortgage. Negotiations were eventually successful, agreement being reached on the form of mortgage appropriate to this transaction and the procedure to be adopted. An announcement was published in the *Supplement* to the *Journal* of September 27, 1952 (p. 143).

Hardship Only

Before the appointed day it was possible in certain circumstances to use the goodwill of a general practice as security for a loan, but the effect of Section 35 of the Act was to destroy this possibility. The Minister has power under the Regulations to make, at his discretion, advance payments of compensation if delay until retirement or death would mean hardship. Advances made hitherto amount in the aggregate to a substantial sum and further payments have been very strictly limited to cases of debts outstanding on the appointed day and incurred through the purchase of a practice. Thus it has been impossible to realize the capital represented by goodwill to finance new projects such as the improvement of practice premises. The possibility of borrowing a proportion of the sum due may therefore be of great help to doctors faced with unforeseen commitments, and, by assigning to the lender the whole of the interest which he is receiving, the borrower is able to pay the interest at the higher rate on the proportion borrowed, without facing recurrent charges.

Rate of Commission

It was only to be expected that, once the possibilities of this scheme were known, finance companies, insurance brokers, and other firms would wish to take advantage of a new field of business open to them. Many doctors will have received circular letters offering to lend money in accordance with the accepted procedure. Whatever may be the opinion of the Association on the practice of circularizing G.P.s on matters of this kind, there is no doubt that it is legitimate business. It is not always made clear, however, that a commission varying between 2½ and 5% (in addition to interest and the legal costs involved in a mortgage) may be charged. Doctors should bear in mind, therefore, that the Medical Insurance Agency, a non-profit-seeking body, is in a position to offer special terms for this facility—lately much improved—and any member interested is advised to consult the Agency when considering a loan on compensation. The address of the Agency's chief office is: Medical Insurance Agency, B.M.A. House, Tavistock Square, London, W.C.1.

G.P. OBSTETRIC BEDS IN BLACKBURN THREATENED CLOSURE

The following resolution and addendum were passed without contrary vote by the Blackburn Executive Council at its meeting on December 8:

"That this Council views with grave concern the fact that it was not consulted or asked to voice its opinion at any time by Blackburn and District H.M.C. or regional hospital board with regard to the proposed closing of Springfield, the only remaining general-practitioner maternity hospital in Blackburn, this being contrary to the smooth liaison which should exist between the local administrative bodies of the N.H.S., and it directs that this protest be forwarded to (1) the Minister of Health, (2) regional hospital board, Manchester, (3) the local M.P.s, and (4) the Executive Councils' Association (England)."

"That no action be taken with regard to the closure of Springfield until the matter has been fully discussed by this Council."

G.P.s' Opposition

The Executive Council's resolution is the latest move in the opposition to the decision of the Blackburn Group Hospital Management Committee and the Manchester Regional Hospital Board to close the 20 G.P. obstetric beds in Springfield Maternity Home on the grounds of redundancy, and to reopen them as geriatric beds. When the hospital management committee's intention became known, Blackburn Local Medical Committee and the Blackburn Division of the B.M.A. passed resolutions of protest and were supported by the Lancashire Local Medical Committee and its chairman, Dr. A. Campbell, who has been prominent in organizing the opposition.

Reasons for Opposition

Local reports indicate that the closure of the Springfield Home would reduce the G.P. obstetric beds in the district from 70 to 50, and, furthermore, the beds at Springfield are the only ones conveniently situated for doctors and patients. The general practitioners consider that the closure of these beds would seriously affect their ability to practise obstetrics and would be contrary to the Ministry's and the profession's policy on the matter of G.P. maternity beds. The executive council's resolution is evidence of the feeling that the hospital management committee and the regional hospital board should have consulted the executive council and the local medical committee before making a decision of such importance to Blackburn general practitioners and their patients.

The Local Position

The population of Blackburn alone is over 111,000. There are 71 general practitioners on the executive council list, of whom 66 are on the obstetric list. The district is a

compact industrial one in which a high proportion of female labour is employed. Home conditions are in the main unsuitable for domiciliary midwifery, and the number of general-practitioner obstetric beds has always been relatively higher than in other areas. There are up to about 100 hospital maternity beds which are not open to general practitioners.

So far the Springfield Home has not been closed. The Blackburn press is devoting much space to a whole-hearted ventilation of local opinion about the matter.

PUBLIC HEALTH COMMITTEE A JUBILEE PARTY

Although its functions and responsibilities have grown considerably with the years, the Public Health Committee is the only committee set up under the new constitution of the Association in 1902 that has not changed its name. The Committee has completed 50 years' work, and during that time has had 12 chairmen, including the present one, Dr. K. Cowan. Not always have they been medical officers of health, for two surgeons, one physician, and one general practitioner have held the office. The last of these was Mr. E. J. Domville, a surgeon of Exeter, who retired from the chair in 1920.

Something to Celebrate

These and other details emerged at a small informal party given by the chairman and members of the Committee at the conclusion of the business of its meeting on Friday, December 11. Dr. Cowan, in a short speech, explained that the Committee thought that its Jubilee was a happy occasion on which to gather together some of those who had helped to guide its work in the past, and who were still living and able to come. Of the past chairmen, Professor R. M. F. Picken, who held office for a record period from 1932 to 1945 (there was a short wartime break from 1939-42 when committee work was suspended), and Dr. J. Fenton were present. Dr. C. Metcalfe Brown was unable to be there. Dr. Cowan welcomed that grand old man of the B.M.A., Dr. Alfred Cox, who was a member of the Constitution Committee which gave birth in 1902 to the Public Health Committee, of which he was later to be secretary, and Dr. R. Forbes, another past secretary. Dr. Charles Hill, M.P., was in Rome and regretfully was unable to be at B.M.A. House too. The Committee clerks were represented by Mr. J. Woodcock, now secretary of the Medical School, Cambridge, and Mr. A. H. Towner, still with the B.M.A. Dr. A. Macrae and the Scottish Secretary, Dr. E. R. C. Walker, and Dr. A. V. Kelyack and Mr. J. D. Huish, the present secretary and clerk, were also there.

The Old Days

Professor Picken, thanking the Committee for the party, spoke in reminiscent vein and recalled in particular the work that Dr. Cox did in support of the Public Health Service. Dr. Cox said a few words in a way which showed that his interest in the affairs of the Association is undiminished. Most members of the Committee, including the President, the Chairman of Council, and the Chairman of the Representative Body, were able to be present.

DUNBARTONSHIRE DIVISION PRESENTATION TO SECRETARY

The Dunbartonshire Division held their annual dinner-dance in the Buchanan Arms Hotel, Drymen, on December 2, when Dr. William Scott, Alexandria, presided over a large gathering of members and friends. Among the guests were Dr. J. T. McCutcheon, Assistant Scottish Secretary, and Mrs. McCutcheon.

During the course of the evening, occasion was taken to make a presentation to Dr. William Gibson, Aurora, Old Kilpatrick, who had been secretary of the Division since 1930 and for over 30 years an active member of many committees.

Questions Answered

Secretary-receptionist and P.A.Y.E.

Q.—I have had a friend living with me who has acted as my secretary and receptionist and whom I have paid a salary of £2 18s. per week. She now wishes to live on her own with a higher salary, and so she becomes liable for coding for P.A.Y.E. My accountant tells me, however, that she has already been liable for coding while living with me, as her accommodation and subsistence have been an additional income. Can you give me the ruling on this?

A.—It was decided by the High Court very many years ago that accommodation and board, being inconvertible by the employee into money, are not "income" on which the employee is chargeable to tax, and I do not understand on what grounds the accountant regards that benefit as "additional income." The questioner is entitled to treat as an expense of her practice the cost of her friend's salary, board, and lodging in so far as that cost was borne for assistance in the work of the practice, and equally, of course, she will be entitled to deduct the monetary cost under the proposed new arrangement. (To avoid misunderstanding I may perhaps add that in the case of certain classes of taxpayer—directors of companies—non-monetary benefits are liable, but this case is outside the scope of such liability.)

Sickness Benefits

Q.—For some years prior to February 7, 1952, I drew sickness benefit under an insurance policy. I claimed back the income tax I had paid on the payments during the financial year 1951-2 on the ground that the payments did not continue for the whole of that financial year. The inspector of taxes replied that as the sickness benefit had been paid continuously for a number of years it is still assessable for 1951-2. May I have your expert's observations on this?

A.—The leading case on this question is *Forsyth v. Thompson* (H.M. Inspector of Taxes) reported in [1940] 2 K.B. 366. It involved, *inter alia*, consideration of a contract with the Medical Sickness Annuity and Life Assurance Society, and several objections to the assessment of the benefit were raised by counsel. The material objection for present purposes was that the benefit did not provide "annual" sums, but only sums payable on contracts which determined at the end of each year. The judge declined to accept that contention and held that the benefits were "annual" and were therefore assessable. The appellant had been "permanently disabled" and the question of whether liability would attach to the final payment of benefit did not arise, and was not referred to in the arguments of counsel or in the judgment. The point is not beyond dispute, but in all the circumstances I cannot advise your correspondent to carry his objection to appeal.

Government Pensions

Q.—Are local or central government pensions treated by the income-tax authorities as "earned" or "unearned" income?

A.—Pensions of the kind referred to are regarded as earned income.

SALARIES COMMISSION IN CYPRUS

The Secretary of State for the Colonies has arranged for Sir Rex Surridge to examine the salary structure of the Government service in Cyprus. The Cyprus Branch has submitted a memorandum of evidence to the Commissioner, and a further memorandum is to be submitted by the Overseas Committee of the B.M.A.

Correspondence

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

Obstetric House Appointments

SIR,—When the more scarce house appointments, such as obstetrics, are being filled may I put in a plea for special consideration for the ex-National Service candidate who has served in a hazardous area—such as Korea or Malaya—in a field unit—that is, as a regimental M.O. or in a field ambulance or the equivalent of these? Others who have served in hospitals or bases deserve consideration for having served at all, but not to the same extent.

I learn from young ex-Service men that if they are fortunate enough to get short-listed they find themselves in competition with men from such places as Eire and South Africa, and with women, and one of these usually gets the post. This group is not liable to two years' National Service and during that period gains extra experience—hospital experience—and so is at an advantage *vis-à-vis* the average ex-Service man under the present system of selection. I was told of one post where the successful candidate, a lady, actually already held the post and was reapplying. Her re-appointment made the third obstetric post she had had, though she disclaimed any intention of specializing. I hope no one will write virtuously that he, or she, always chooses the most experienced candidate. It depends on the definition of "experience." I am not advocating the appointment of a nitwit just because he has served. I am submitting that most men who have experienced the responsibilities, hardships, and hazards of active service in the field mature more rapidly than those who have not had such experience. Further, that that special experience is an asset in a houseman. I urge that special credit be given to ex-Service candidates for such house appointments as obstetrics for serving their country in dangerous areas to offset the purely hospital experience of others who have not served at all.—I am, etc.,

Maldon, Essex.

IVAN PIRRIE.

Service Recruitment

SIR,—It must be accepted that Service life, by its nature, can appeal only to a comparatively small number. The Naval Medical Service now being virtually split into a "specialist" and a "general practitioner" service, this is particularly true of the latter. There is here little or no place for the practitioner whose only professional interests lie in a constant supply of clinical material. A medical officer must be able to take a much wider view of his profession and find interest in all details, many at first sight irrelevant, which affect the well-being of the men in his care. The medical officer of a destroyer who cannot profitably employ himself after 0930 is obviously unsuited for "general practice" in the Navy. This is in no way to disparage "N.S.M.O." (*Supplement*, November 28, p. 213), but, accepting that his interests are deep rather than wide, I cannot believe that any practicable alterations in conditions of service are likely to attract him.

Although I cannot speak for the specialists, it would seem that, at present, the established specialists in the Navy enjoy advantages which make the branch reasonably attractive—specialists' allowances, relative security in the tenure of appointments, few appointments necessitating prolonged separation from their families, and excellent prospects of promotion to the highest ranks. Perhaps any further improvement in their lot might lie in the amalgamation of the hospital and specialist facilities of the three Services. It is that small proportion of the profession who, by virtue of their inclinations, would make efficient and, with suitable conditions, contented general practitioners within the Service who most need attracting. It is of no use that these officers should be frustrated specialists.

The factors which discourage such from joining are many. Among them I would number: (1) Uncertainty as to the duration

of a current appointment and inability to forecast the probable nature or whereabouts of the next; (2) difficulty in finding accommodation for families; (3) poor prospects of promotion to the higher ranks, but, for the great majority, compulsory retirement at the age of 55 at a time when expenses are likely to be heaviest; (4) necessary but tedious paper-work which could well be done by ratings properly trained in clerical duties; (5) absence of adequate facilities to undergo short refresher courses in civilian hospitals; (6) pay not closely enough related to one's civilian counterpart; and (7) a widespread lack of confidence, born of past experience, in the good faith of those responsible for determining pay and conditions. There is a fear that if by various inducements and attractions the medical services were to reach full complement there would follow an arbitrary reduction in pay and deterioration in conditions of service. The steps which might be taken to remedy these defects are, generally, self-evident. The housing shortage is, of course, nation-wide and the medical officer cannot expect special advantages.

How best to deserve and win the full confidence of the profession is a matter with which the powers that be should seriously concern themselves. It is essential that this confidence should exist, for once the medical officer has accepted a permanent commission his future is entirely in their hands. He does not even retain the right to resign. Perhaps this present lack of confidence may, after all, prove the greatest obstacle.—I am, etc.,

G.P., R.N.

The G.M.C.'s Warning

SIR,—The *Concise Oxford Dictionary* defines "council" as an "advisory or deliberative assembly." Accordingly the G.M.C. was strictly correct in its warning, which achieved wide publicity. Whether this warning, which must be repugnant to the vast majority of doctors, was necessary or desirable is a different question. If the majority resent it, their remedy must lie in strenuously opposing the re-election of its sponsors to the Council. One would not continue to play golf or bridge with gentlemen who consider it necessary to warn their colleagues against sharp practice.—I am, etc.,

Harrow.

J. E. S. STEPHENS.

SIR,—Dr. C. H. Ross Carmichael's letter is timely. I seem to remember receiving through the post a few days ago a printed copy of this warning. Unfortunately, I did not keep it, but it was probably sent by the G.M.C. It irritated me and I tore it up. Is it really necessary to bring to the notice of the whole profession that fraud is a crime?—I am, etc.,

Rugby.

W. J. BOLD.

Sweated Doctors

SIR,—I am very glad to see from Dr. H. Kelson Ford's letter (*Supplement*, December 5, p. 221) that there are men holding house appointments who do not consider themselves imposed upon by the need for long hours of work. The resident is seen to be in clover when conditions of service are compared with those of 40 years ago. At that time board residence was the full recompense in teaching hospitals in London and was regarded as ample when coupled with the splendid experience a hard-working young doctor obtained.

I admire the spirit of Dr. Ford's letter and hope that there are still plenty of men of that calibre entering the medical profession.—I am, etc.,

London, W.1.

HUMPHREY NEAME.

SIR,—My previous letter on this subject (*Supplement*, November 14, p. 200) was prompted by my observing the pale, tired appearance of housemen I occasionally encounter. I feel rather concerned over Dr. H. Kelson Ford's patients. He tells us (*Supplement*, December 5, p. 221) that he likes "to see each patient's progress from hour to hour and day to day. . . ." This is certainly doctoring at its very best. Later on in his letter he tells us he has a month's annual leave, occasional week-ends, and frequent free afternoons. How are his patients faring in the meantime? The only really practical suggestion I can offer him is borrowed from African witch-doctors. In their

enforced absence they leave a carved wooden little deputy to keep an eye on their patients. I think this is a capital idea for those of us who would like a free week-end occasionally.—I am, etc.,

Shrewsbury.

ALBERT E. NICHOLLS.

Remuneration of Hospital Medical Staff

SIR,—It is now over a year since negotiations were started in the Medical Whitley Council Committee "B" for the revision of the remuneration of hospital medical staff. It is many months since the Management Side gave an undertaking to reply to the Staff Side's proposals within a month, and since the Minister of Health, in answer to a question in the House, gave the assurance that negotiations would not be unduly protracted.

Our claims are simple and clear-cut. The Government and the profession have both accepted the recommendations of the Spens Committee as a basis for the remuneration of medical staff in the Health Service. The Danckwerts award to general practitioners has fixed a betterment factor to be applied retrospectively to G.P.'s remuneration. It is surely simple justice to demand that the same betterment factor be applied retrospectively to hospital medical staff in the same way. Why, then, if the Government and Management Side are acting in good faith, should there be any delay in meeting our claim?

I suggest that we should meet this problem in the same way that our general-practitioner colleagues have solved theirs—namely, (1) that the Management Side should be asked to reply by a specified date; (2) if they do not reply, or their reply is unsatisfactory, we should ask that our claim be submitted to arbitration; (3) if this is not agreed to, then the Association should organize the threat of mass resignation from the hospital service in the same way as was done for our G.P. colleagues.

Sir, we are over five years in arrears in the receipt of part of our salary. Is it not high time that this appalling state of affairs was remedied?—I am, etc.,

Meols, Cheshire.

E. SNELL.

Fees for Coroners' Necropsies

SIR,—In the *Supplement* of November 28 (p. 214) you published a very timely letter from Dr. A. Piney on the subject of fees for coroners' necropsies. I think the following experience of mine is pertinent to the matter raised.

About a year ago I performed a necropsy and gave evidence at the inquest. A local undertaker conveyed the body from the deceased's house to the mortuary and took it back—in all a total distance of half a mile. To my astonishment I gathered afterwards that the undertaker's fee exceeded mine of 3 guineas by many shillings.

Is it too much to expect the B.M.A. to bestir itself on behalf of those members not recipients of a Danckwerts award or equivalent?—I am, etc.,

Wales.

C. L. HOLLICK.

Unwilling to Pay

SIR,—With reference to the letter by Dr. W. B. Mumford and others (*Supplement*, November 28, p. 214), for many years it has been my practice under such circumstances to say to the relations: "Go to the agent or the head office of the company and say that your doctor has advised you to go to your solicitor and to tell him that he (your doctor) is prepared to go to court and give evidence on your behalf."

I have never known this to fail and payment not to be made on the spot.—I am, etc.,

London, S.E.25.

H. H. A. ELDER.

The Facts on Forms

SIR,—Is it unreasonable to expect the staff of the local Ministry of National Insurance and food offices to know a few of the facts of life? I have to-day had brought back to me by an expectant mother a form for maternity benefit on which I had put the day and month of her expected delivery but not the year. This omission was heavily marked in red pencil. The mother in question therefore had to make a

special journey to wait in a crowded surgery in order that I should insert four figures before she could hope to draw her benefit.

I am likewise frequently asked for continuation "extra ration" certificates by women who are within a week or two of their expected confinements, the dates of which are already known to the food office, and whose state of, as yet, uncompleted pregnancy must surely be apparent to anyone.—I am, etc.,

Wordsley, near Stourbridge.

MARY J. BARTLETT.

Practice Premises

SIR,—Once again the question of the doctor's "workshop" has been raised in the House of Commons, and action is to be suspended until the results of the G.M.S. Committee's letter (*Supplement*, October 10, p. 165) are seen.

I feel, Sir, that this is yet another fault following our relinquishment of the goodwill of our practices. For we must be loath to spend, say, £500 on the improvement of premises that we may never dispose of to another doctor. Of course, if this were not to be considered a capital expense by the income-tax authorities, some relief could be afforded to those public-spirited doctors who were not too much concerned with the impossibility of "seeing their money back."—I am, etc.,

Seven Kings, Essex.

I. M. SEGAL.

Bang goes Saxpence

SIR,—With the differences in dispensing fees between England and Scotland, some of the proprietaries which are cheaper than the official preparations in England turn out to be dearer than the official ones in Scotland—e.g., tab. gardenal, tab. gardenal sod., "physeptone" tablets, "pabestrol" tablets. Others, cheaper in England, are of equal price in Scotland—e.g., "benerva" tablets, "cantan" tablets, "sulphamethazine" tablets. This causes rather a headache to those of us who have practices on the border and have patients in both countries.—I am, etc.,

Newcastle-on.

ARTHUR D. BETHUNE.

Economy in Prescribing

SIR,—We, the undersigned, all experienced and fully occupied in general practice, realize the necessity of economy in prescribing. We are eager to assist the Minister in his efforts to procure this economy, but feel that the means adopted to date by the Ministry have produced little but frustration.

The Cohen Committee's report and several official publications imply that there should be no absolute restriction on the prescribing by a G.P. of any drug which, in his opinion, is necessary for the proper treatment of a patient, but that he might have to justify his doing so before his colleagues on the local medical committee. Such justification, in our view, can be most difficult, as (a) the drug is given in all good faith at the time, and the choice is based on the G.P.'s clinical judgment and experience, and (b) the charge of over-prescribing does not arise until many months have elapsed and when the case history and its attendant subtleties have faded in the memory.

Much has been published, both official and unofficial, entreating the G.P.s to economize in their prescribing, but no positive lead, we submit, has yet been given on how they are to accomplish this. No doctor is likely to expose himself to a charge of over-prescribing unless he believes in the efficacy of the drug he prescribes. He does not prescribe irresponsibly, as the Ministry seems to think. It is a widely held impression among G.P.s, especially those in industrial areas, that those who compile the various categories have little or no knowledge of general practice as it exists in these areas. We feel that the public are not given sufficient direction by propaganda, etc., to ease their demands on the G.P., and told that they too have to take part in the economy drive. To them, apart from paying their shilling, the service is free. We realize that this is fraught with political difficulties. We believe that much of the responsibility for the prescribing of proprietary drugs rests on the

hospital consultants, as their advice, when sought, is usually studded with proprietary preparations. Very often, if the patient has been in hospital, he presents himself at the surgery with a detailed list of things he has to be given. We have yet to hear of a consultant having to justify his prescribing.

Until such a time as the Minister has the courage to tackle the service as a whole—patients, consultants, G.P.s, chemists, and proprietary drug manufacturers—we consider he is unlikely to achieve the reduction in the drug bill we all wish to see.—We are, etc.,

B. MACKENZIE HEGARTY. A. J. MARSHALL.
H. M. MURRAY. J. G. FISHER.

Luton.

POINTS FROM LETTERS

General Practice Vacancies

Dr. HECTOR SMITH (Southall, Middx) writes: It is becoming evident that young doctors are having difficulty in getting practices of their own, and that the better the qualifications they may hold the greater is their difficulty. . . . A very small practice might provide just the opening required by some energetic and capable young doctor, but as he will be hoping to carve a bigger practice from among the patients of other practitioners he is not likely to be given the opportunity under the present arrangement. I would suggest that all appointments to vacancies should be made by the Medical Practices Committee, or some other central body, none of whose members are likely to be interested persons.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Rear-Admiral T. Madill, C.B., O.B.E., Q.H.P., has retired.

Acting Interim Surgeon Lieutenant-Commanders T. C. Barras, F. A. F. MacKenzie, and J. Keeling to be Surgeon Lieutenant-Commanders.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commander J. D. Simpson has retired.

TERRITORIAL ARMY

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel (Honorary Brigadier) F. R. Sandford, C.B.E., M.C., T.D., Q.H.P., from Active List, to be Colonel.

Colonels J. B. Forsyth, T.D., T. F. Briggs, O.B.E., T.D., M. E. M. Herford, D.S.O., M.B.E., M.C., L. Fletcher, O.B.E., and A. T. B. Dickson, O.B.E., T.D., from Active List, to be Colonels.

Lieutenant-Colonel A. A. Eagger, C.B.E., T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., and has been granted the honorary rank of Brigadier.

Lieutenant-Colonels (Honorary Colonels) W. A. Lister, T.D., R. P. S. Kelman, T.D., and F. A. R. Stammers, C.B.E., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Lieutenant-Colonels T. A. S. Samuel, M.C., T.D., W. R. Blunt, T.D., W. J. McIntosh, O.B.E., T.D., C. J. Cellan-Jones, T. T. P. Murphy, O.B.E., T.D., and A. Harrison-Hall, having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Major (Honorary Colonel) E. Parry, from Active List, to be Major.

Major (Honorary Colonel) J. K. Reid, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Majors (Honorary Lieutenant-Colonels) J. McKenzie, St. C. E. J. Barrett, and D. Laing, having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Major W. B. Evans, from Active List, to be Major, and has been granted the honorary rank of Lieutenant-Colonel. (Substituted for the notification in a *Supplement* to the *London Gazette* dated June 16.)

Majors S. F. Seelig, J. Gregory, and S. H. Madden, from Active List, to be Majors.

Major R. E. Holme, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Captain (Honorary Major) W. H. Stephen, having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

ROYAL AIR FORCE

Air Vice-Marshal W. E. Barnes, C.B.E., Q.H.S., has retired at his own request.

Group Captain B. W. Cross has retired at his own request.

Squadron Leader J. N. Agate has relinquished his temporary commission, retaining his rank.

Flight Lieutenants M. F. P. Marshall and A. Stewart have been transferred to the Reserve, retaining the rank of Squadron Leader.

Flight Lieutenants R. A. Armstrong, T. B. Benson, and J. Donnelly have reverted to the Reserve, retaining the rank of Squadron Leader.

Flight Lieutenants P. W. Robertson, C. J. W. Soutar, T. M. Nott-Bower, and W. A. Crawford to be Squadron Leaders.

ROYAL AIR FORCE VOLUNTEER RESERVE

Flight Lieutenants S. Bender and G. A. Mandow to be Squadron Leaders.

Association Notices

Diary of Central Meetings

DECEMBER

22 Tues. Waverley Evidence Committee, 11 a.m.
22 Tues. Finance Committee, 2 p.m.
31 Thurs. Guillebaud Steering Committee, 10.30 a.m.

JANUARY

7 Thurs. Central Consultants and Specialists Committee Executive, 2.30 p.m.
8 Fri. Industrial Injuries Evidence Subcommittee, Occupational Health Committee, 2 p.m.
12 Tues. Amending Acts Committee, 2 p.m.
15 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.
15 Fri. Scientific Exhibition Subcommittee, Arrangements Committee (at Glasgow Regional Office, 234, St. Vincent Street, Glasgow), 7.45 p.m.
20 Wed. Rehabilitation Committee, 10.15 a.m.
20 Wed. Health Visitors Evidence Committee, 2 p.m.
20 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.

Branch and Division Meetings to be Held

TOWER HAMLETS DIVISION.—At Poplar Hospital, East India Dock Road, E., Friday, December 18, 8 p.m., meeting. Mr. J. Suchet: "Uses and Abuses of Hormones in Gynaecological Practice."

Meetings of Branches and Divisions

ENFIELD AND POTTERS BAR DIVISION

A meeting of the Division was held at the Chase Farm Hospital, Enfield, on November 13, 1953. The following motion was debated: "That in the opinion of this meeting there is room for improvement in the relationship and mutual understanding between general practitioners and hospital medical staffs."

The following were some of the points made by speakers: experience of general practice is desirable for specialists; the gap between general practitioners and hospital medical staffs is increasing; let hospital staffs beware of the unguarded word that might be construed by the patient as reflecting criticism of the general practitioner; the general practitioner should avoid any overstatement of the urgency of a case when seeking its admission to hospital; consultative clinics and domiciliary visits provide an invaluable bridge over the gap between consultants and general practitioners; too many minor accidents are referred to hospital in the evening, and too many non-urgent cases are referred to x-ray examination at the week-end; the "hospital letter" should be written and dispatched on the day that the patient leaves hospital.

Arising out of the debate, the following suggestions, among others, were made: that a time should be arranged at which members of the hospital medical staff would be available for consultation with general practitioners concerning their patients undergoing treatment in hospital; and that facilities should be made available to house medical officers to spend a day or series of days with a general practitioner to enable them to gain some knowledge of general practice.

HOLLAND DIVISION

A meeting was held at the Peacock and Royal Hotel, Boston, on November 28, 1953. With Dr. W. Gibson Barrie in the chair, there were 40 members present. Mr. L. G. Cruickshank addressed the meeting on the subject of "Cardiac Surgery—the Present Advances."

Correction.—We regret that a mistake was made in reproducing the letter from Dr. Cyril F. Mayne in last week's *Supplement* (p. 229). The second paragraph should have begun as follows: "Taking the mass of letters as a whole, however, one thing strikes me as outstanding: the unwillingness of the young members of our profession, of all professions, to carry out their duty in the armed Forces of our country."

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 26 1953

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The B.M.A. in Committee

SPECIAL GROUPS

The setting up of special Groups, with their committees, which the Council first sanctioned some 20 years ago, is not a departure from the democratic constitution of the Association but a reinforcement of it. The aim is to secure that the voice of those members who have special interests, but whose numbers are so few or who are so distributed that they cannot command anywhere a majority, or perhaps not even an influential minority, shall be heard in Association councils. For many years the Association was regarded as being preoccupied with the welfare of general practitioners, although in fact many of its principal officers and active councillors have been and are consultants. It was a pre-eminent surgeon, Sir Victor Horsley, who took the lead in establishing the Representative Body. Sir Henry Butlin, a president of the Royal College of Surgeons, was for six years the Association's treasurer. Andrew Clark, Chairman of Council during the reform period, Lawson Tait, Edmund Owen, J. R. Thomson, Robert Saundby, Bishop Harman, and many others, not to name anyone now living, were consultants and specialists.

Specialist Opinion

Nevertheless, the difficulty of assembling the opinions of specialists and consultants on professional issues was increasingly felt. In many Divisions the number of members who are consultants or specialists is very small; in only a few does it constitute a considerable proportion, and perhaps in only one (Marylebone, which includes the Harley Street sector) is it preponderant. Therefore some 20 years ago it was decided to adopt the machinery of specialist Groups.

The Groups consisted of those whose interests were not adequately represented in the Divisions and Branches either by reason of the fact that their numbers were small or because they were inadequately distributed from the point of view of ensuring representation. There was a good deal of discussion at the time on what constituted a "full" or "pure" consultant, but the proposal went through the Council without dissent. At the same time the then Chairman of the Council, the late Sir Henry Brackenbury, expressed the hope that the Groups would be temporary and would remain only until consultants had been persuaded to pull their weight in the Divisions and Branches, when there would be no further need for the Groups. Other members of Council, among them Dr. Dain, took the view that the Groups would be a permanent feature. In a sense both prognostications have been proved right.

The First Groups

In May, 1934, consultants and specialists Groups were formed for England and Wales, for Scotland, and for Northern Ireland. Other more specialized Groups quickly followed. In 1938, for example, two of the largest Groups were established, the Ophthalmic Group, which reported 353 members, and the Orthopaedic Group, which reported 110 applications at its first meeting. The latter Group set to work at once to investigate and endeavour to improve the teaching of orthopaedic surgery in the universities and schools. A more restricted and immediate matter was to send a pronouncement from the Association on the danger of ill-fitting shoes.

The interests of consultants and specialists in general are now covered by a large autonomous body, the Central Consultants and Specialists Committee, which has 70 members. On that committee each of the special Groups is represented. The 13 Groups now in existence, together with the number of members in each, are as follows:

Dermatologists	185
Ophthalmic	465
Orthopaedic	265
Otolaryngologists	204
Physical Medicine	106
Psychological Medicine	338
Radiologists	366
Tuberculosis and Diseases of the Chest	537
Anaesthetists	784
Consulting Pathologists	260
Full-time non-professional Medical Teachers and Research Workers	312
Spa Practitioners	47
Venereologists	150

Conditions of Membership

Each Group has its own criteria for membership and its own rules. Basically the rules for the Groups are that the member must be predominantly employed in the practice of his specialty. This applies to the first eight Groups in the above list. The Anaesthetists Group consists of members of the Association who are under contract as anaesthetists with a regional hospital board or board of governors on either a whole-time or regular sessional basis, or who are anaesthetists on the staff of recognized hospitals outside the National Health Service. The Consulting Pathologists Group likewise consists of members who hold permanent appointments as pathologists in the National Health Service or who, not being in that service, have devoted at least five years to the postgraduate study and practice of pathology and continue to be engaged predominantly therein. The Group of full-time non-professional Medical Teachers and Research Workers consists of those who are full-time members of a university staff or full-time salaried research workers in university departments or other institutes.

The Spa Practitioners are a small body of those who regularly prescribe the mineral waters or baths of the spas in which they reside or are on the staffs of hospitals or clinics where the use of the local mineral waters is part of the routine treatment. Finally the Venereologists Group consists of members of the Association who have been qualified for at least five years and who are—and have been for at least three years—either engaged principally in the practice of venereology or are in charge of venereal disease clinics, though not engaged predominantly in that specialty.

A Group with a Difference

In addition there is one other Group which is on a different basis—the Registrars Group, which consists of persons who are in a temporary grade. The other Groups comprise individuals engaged in a specialty, but the Registrars Group, which has been in existence for only five years, cannot deal, of course, with specialist problems; its field is the general problems pertaining to registrars in all the specialties. It is a particularly active Group and has put forward a number of ideas which the Central Consultants and Specialists Committee (on which it has two representatives, whereas the other Groups have only one) and the Joint Committee have negotiated with the Ministry. The registrars have taken steps to ensure that the membership of their committee shall include representatives of both registrars and senior registrars from teaching and non-teaching hospitals alike.

This article is not intended to be a record of the achievements of the various Groups, but many of them have been very active. The Tuberculosis and Diseases of the Chest Group has published reports in the *Supplement* which have aroused widespread public attention. The Anaesthetists Group has done some constructive work on anaesthetic equipment. The Consulting Pathologists Group held a recent conference at which methods of blood transfusion were discussed. The Psychological Medicine Group had an interesting discussion a year or two ago on hypnotism in medical practice, and so with the others.

Liaison with Kindred Societies

The Groups are in close liaison by means of cross representation, or sometimes by joint committees, with the corresponding professional associations: for example, the Association of Anaesthetists or the Medical Society for the Study of Venereal Diseases. They are in fact expert bodies, and the Council will always refer to them for the advice which may be sought from time to time of the Association by the Ministry of Health or other outside bodies.

Each of the Groups has a committee, one-third of whose members retire annually. It is elected generally by postal vote or it may be from regional constituencies. There is an annual meeting of each Group, open to all members. In the case of the Registrars Group it would hardly be practicable to summon all the registrars in the country, and in this case the committee is elected from the Regional Associations.

The Groups are formed strictly according to the Association's by-laws. Permission to form a group is given by the Council, subject to appeal to the Representative Body. If the Council is of opinion that the ordinary machinery of the Association is sufficient for the representation of the particular interests concerned the petition for a group will be dismissed. The inclusion of any individual within a group is at the discretion of the Group committee and the candidate must sign a declaration that he comes within the prescribed definition. There is no additional subscription, by the way, for Group membership.

The findings of the Group committees are referred to the Central Consultants and Specialists Committee, which in its turn reports them to the Council, and if the findings come also within the reference of some other standing committee they are referred to it for its views. In this way the policy of the Association in these matters is carefully formulated.

THE ASSOCIATION AND PUBLIC HEALTH

A meeting of the Public Health Committee was held on December 11, with Dr. H. K. Cowan in the chair. The action of the chairman in appointing Dr. H. D. Chalke as representative of the Committee on the Control of Medical Manpower Committee and Dr. H. M. Cohen as one of the Committee's representatives on the Public Relations Committee was approved. The Committee also appointed representatives on the Liaison Committee, which up to now has embraced consultants and general practitioners only, but which it had been felt should be widened to include public health medical officers.

The Committee approved a memorandum for submission to the Steering Committee which is preparing the Association's evidence to the Guillebaud Committee. In this connexion the Committee had before it a note on hospital costs from which it appeared that the cost for domiciliary care and treatment was considerably less than that for treatment in hospital.

General Practitioners and Health Visitors

The report of the joint Subcommittee of the Public Health and General Medical Services Committees regarding co-operation between general practitioners and health visitors was considered.

Arising from a resolution of the Annual Representative Meeting, a statement of guidance had been drawn up. In approving the report, and a statement for submission to Council, it was also agreed to recommend that the document be submitted to the council of the Society of Medical Officers of Health with a view to obtaining agreement for joint publication.

Vaccination

The Committee considered the recent Ministry of Health circular regarding B.C.G. vaccination of schoolchildren. It was pointed out that this circular had been sent to local health authorities and to local education authorities, who had been asked to co-operate. It was reported that the General Medical Services Committee had expressed regret that the Association had not been given an opportunity to see the document. The Public Health Committee concurred with this view.

At a previous meeting the Committee had considered the resolution of the Representative Body urging measures centrally and through the Divisions to secure vaccination of all infants against smallpox. The matter had been the subject of correspondence with the Ministry of Health, which was equally anxious to ensure a high proportion of infant vaccinations. Local health authorities were already aware of the importance of this matter. The Chairman said he felt that medical officers of health were doing everything they could, but he suggested that the Council might reinforce such action by urging every individual general practitioner to do his best with his individual patients to bring about this desired result. It was agreed that this action be recommended to Council.

Superannuation Regulations

Dr. Wand, Acting Chairman of the Compensation and Superannuation Committee, reported on the revised draft of the Local Government Superannuation (Benefits) Regulations. The main point at issue concerned the exclusion of medical and nursing staff of a local authority from the Regulation that "Where, for the efficient discharge of his duties, a contributory employee of an employing authority is required to possess professional or other qualifications not ordinarily to be acquired in the service of the authority, the authority may, if application for the purpose is made in accordance with the regulation, direct that a number of years be added to his contributing service." It has always been the view of the Association that the principle of "added years" should apply to doctors, and great disappointment was expressed at the alteration in the original

draft regulations. It was agreed to make representations to the Ministry on the subject and to request that a deputation be received.

Disclosure of Records to Police

Discussion took place on a letter from a Divisional secretary concerning the propriety of disclosing medical records to the antenatal clinic to the police. The police had asked the public health department for certain records, but access to the records had been refused. Dr. Robert Forbes, who was attending the Committee in connexion with another item on the agenda, pointed out that the records were not the property of any medical officer but of the local health authority. It would, however, be for the medical officer of health to explain to his committee the profession's ethical rules. It was conceivable that the police might report the refusal to their own watch or standing joint committee, which might then ask the Public Health Committee for the records. It appeared that the occasion might arise when the duty of an employee conflicted with the ethical views of the profession. In such a situation it was for the individual doctor to judge what course he should follow, but in the view of the Committee every effort should be made to adhere to the ethical rules.

After discussion the Chairman said that Dr. Forbes as Chairman of the Central Ethical Committee would have gathered the opinion of the Public Health Committee, and the Committee would hope for guidance from the Ethical Committee in due course.

Other Matters

The Committee appointed four of its members to a joint subcommittee appointed to give further study to the question of the establishment of an integrated service for treatment and rehabilitation of the chronically disabled as a result of age or illness.

The Assistant Secretary reported on the four authorities which are still not fully implementing the awards of the Industrial Court and the appeals relating to these cases. An interim report was also given regarding further discussions on the appeals machinery for the medical profession in Northern Ireland.

Notes and News

American Medical Association.—In the report of the secretary to the members of the House of Delegates of the American Medical Association (*Journal of the American Medical Association*, November 7, 1953) the following information about membership is given. The number of paid members increased during the first eight months of 1953 by 7,323, making a total of 117,063, against 109,740 in 1952. The revenue from subscriptions for the first eight months of 1953 was \$2,923,625.25. The comparable figure for 1952 was \$2,739,520.00. The headquarters' personnel now numbers 823 full-time workers in the office and mechanical departments.

Appointment to Board of Governors.—The Minister of Health has approved the appointment of Mr. Norman Roberts to fill an outstanding vacancy on the board of governors of the United Liverpool Hospitals for the period ending March 31, 1956.

Economy with Efficiency.—The following question appeared in a paper on medicine in the Final examination for the degree of M.B. of Manchester University: "By what means could you, as a general practitioner, reduce the cost of prescribing while maintaining or increasing the efficiency of your practice?"

Hospitality Wanted.—The 20-year-old daughter of a professor of surgery in Switzerland would like to receive hospitality from a medical family in London from January, 1954, for some time, either as a paying guest or in return

for hospitality to an English girl in Switzerland. The Swiss girl is coming to London to study handicrafts. Would anyone interested please communicate with Dr. H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Questions Answered

Colonial Medical Service Income-tax Liabilities

Q.—I am a member of the Colonial Medical Service (permanent and pensionable) serving in the Gold Coast. Before leaving the U.K. last July I applied for repayment of income tax I had paid during the current year. I had been on leave without pay for two years in order to acquire a higher qualification and had been employed in the hospital service during that time. Repayment was refused on the grounds that I was leaving my wife and family in the U.K., and that, as my tours of service would only be 18 months, I was considered as being technically resident in the U.K. I was also told that any moneys I remitted to the U.K. would be liable to taxation if I spent as much as a single day in the year in the U.K. Is this correct?

A.—Two questions are raised: (a) Whether income-tax liability attaches to the earnings in this country; and (b) What is the tax position during absence from the United Kingdom? It should be borne in mind that in law an individual can be "resident" in more than one country in the same financial year. If this results in income-tax liability in both countries there is usually relief provided under the various double-taxation agreements made between the Governments concerned. As regards the Gold Coast, this agreement is embodied in Statutory Rules and Orders, 1947, No. 2868, issued by H.M. Stationery Office in 1948, price 2d.

(a) Assuming that in each of the financial two years concerned the questioner was in the United Kingdom for at least 183 days, he would rank as a British resident for those years and as such would be liable to British income tax. (b) Whether the questioner would rank as a British resident while actually abroad would depend partly on whether he was in the United Kingdom for 183 days of the financial year concerned, and partly on whether there was an abode in the United Kingdom available for his return. If he has to pay tax here for such years he may be able to claim credit for that tax against tax payable by him abroad on his Service earnings, but that is a matter which he can best raise locally when and if he becomes liable to payment of British tax.

Income-tax Relief on Expenses

Q.—Are the following expenses allowable against income tax: (1) graduation fee at university; (2) registration fee with General Medical Council, membership of B.M.A., and membership of a medical defence society; (3) purchase of instruments?

A.—(1) This is not allowable. Objections are (a) that such an expense is not incurred wholly and exclusively for the purposes of the profession, and (b) that such fees are capital outlay for the purpose of acquiring a particular status or qualifications. (2) Fees paid to professional associations are allowable in the case of individuals in practice on their own account or in partnership, provided that they are annual expenses and not of the once-for-all order. In the case of individuals in employment these fees are not allowable unless maintenance of membership is required by the terms of the contract of employment. (3) Expenditure on the purchase of professional instruments is allowable to the extent to which it is incurred to maintain rather than to acquire or improve the professional equipment of the individual concerned. In the case of an employee it is assumed that the maintenance of the private equipment is a condition of the employment.

Correspondence

Lord Horder's Address

SIR,—I observe in the *Supplement* of November 28 (p. 210) that Lord Horder, during an address to the Fellowship for Freedom in Medicine, is reported as saying, "Those who spoke for the whole profession had always declared themselves against a whole-time service, but we were now told that it would not be long before a whole-time service was a *fait accompli*."

In view of the declared policy of the B.M.A., I feel that the identity of Lord Horder's informants should be revealed to the profession, and have been surprised to find no reference to this quotation in either the editorial or the correspondence columns of a subsequent issue of the *Journal*.—I am, etc.,

Chigwell, Essex.

J. D. WIMBS.

Entry into Medicine

SIR,—In the *Journal* of August 29 (p. 490) there appeared a table of statistics on which no adequate comment has been made. This shows, in short, that there were just over 12,000 more doctors on the *Register* in 1952 than in 1943.

It would be good if your actuary could work out what is the probable increase in numbers for, say, the next ten years, and how many practitioners can be absorbed in practice during the same time in the United Kingdom.

Unless I am very much mistaken it will be found that there will be thousands of young doctors who have no prospect of getting established in practice. Nor can I see that anything, short of shutting perhaps half the medical schools, will bring the numbers down to requirements.

I need hardly say, Sir, that this is a matter of the utmost importance to the profession.—I am, etc.,

London, N.16.

D. S. BRYAN-BROWN.

B.M.A. LIBRARY

The following books have been added to the Library:

- Anderson, A. K.: *Essentials of Physiological Chemistry*. Fourth edition. 1953.
 Archer, W. H.: *Manual of Oral Surgery*. 1952.
 Ashdown, A. M., and Bleazby, E.: *Anatomy, Physiology, and Hygiene: A Textbook for Nurses*. Revised edition. 1952.
 Bach, S. J.: *Metabolism of Protein Constituents in the Human Body*. 1952.
 Banks, A. L.: *Social Aspects of Disease*. 1953.
 Banks, S. W., and Laufman, H.: *Atlas of Surgical Exposures of the Extremities*. 1953.
 Barton-Wright, E. C.: *Microbiological Assay of the Vitamin B-Complex and Amino-Acids*. 1952.
 von Brand, T.: *Chemical Physiology of Endoparasitic Animals*. 1952.
 British Association for the Advancement of Science: *A Scientific Survey of Merseyside*. 1953.
 British Red Cross Society: *First Aid Manual No. 1*. Tenth edition by Sir Harold E. Whittingham and Sir Stanford Cade. 1952.
 Brown, R. W.: *Dr. Howe and the Forsyth Infirmary*. 1952.
 Collins, V. M. E.: *Approach to Psychology*. 1953.
 Conway, E. J.: *Biochemistry of Gastric Acid Secretion*. 1953.
 Dearden, H.: *Science of Happiness*. Revised edition. 1952.
 Dogliotti, G. C.: *Medicina Interna*. 1953.
 Hadfield, J. A.: *Mental Health and the Psychoneuroses*. (Abridged edition of *Psychology and Mental Health*). 1952.
 Hallmann, L.: *Bakteriologische Nährböden*. 1953.
 Hausworth, Q.: *Vegetative Konstitutionstherapie*. 1953.
 Houghton, M.: *Aids to Theatre Technique*. Second edition. 1952.
 Hutschnecker, A. A.: *The Will to Live*. 1952.
 Knott, G. H. (Editor): *Trial of William Palmer*. Third edition. 1952.
 Král, F., and Novak, B. J.: *Veterinary Dermatology*. 1953.
 Ledlie, R. C. B., and Harmer, M.: *Aids to Surgery*. Eighth edition. 1952.
 Leslie, I.: *Aids to Organic Chemistry for Medical Students*. Fourth edition. 1952.
 Ludovici, A. M.: *Quest of Human Quality: How to Rear Leaders*. 1952.
 Lüscher, E.: *Lehrbuch der Ohrenheilkunde*. 1952.
 Meyer, H. F.: *Essentials of Infant Feeding for Physicians*. 1952.

- Montag, M. L., and Filson, M.: *Nursing Arts*. Second edition. 1953.
 Moroney, J.: *Surgery for Nurses*. Second edition. 1952.
 Mozley, A.: *Background for the Prevention of Bilharzia*. 1953.
 Murray, G.: *Matters of Life and Death: An Inquiry into Spiritualism, Faith Healing, and Psychic Research To-day*. 1953.
 Neustatter, W. L.: *Psychological Disorder and Crime*. 1953.
 New York Academy of Medicine: *Committee on Public Health Relations, Infant and Maternal Care in New York City: A Study of Hospital Facilities*. 1952.
 Normanton, H. (Editor): *Trial of Alfred Arthur Rouse*. Second edition. 1952.
 Penry, J.: *The Face of Man: A Study of the Relationship Between Physical Appearance and Personality*. 1952.
 Pieraccini, G.: *Lavoro Femminile Casalingo ed Estracasingo: Eugenica ed eutenica*. 1953.
 Poppel, M. H., et al.: *Roentgen Aspects of the Papilla and Ampulla of Vater*. 1953.
 Schultze-Niemann, M.: *Schöpferische Gestaltung aus dem Unbewussten*. 1953.
 Seiverd, C. E.: *Hematology for the Medical Technologist*. 1952.
 Shestack, R.: *Handbook of Pharmacology for Nurses*. 1952.
 de Swiet, J.: *Essentials for Final Examinations in Medicine*. Fourth edition. 1952.
 Thompson, G. N.: *The Psychopathic Delinquent and Criminal*. 1953.
 United Nations: *Atomic Energy Section. International Bibliography on Atomic Energy. Vol. 2. Scientific Aspects. Supplement I*. 1952.
 Walker, B. S., et al.: *Biochemistry and Human Metabolism*. 1952.
 Wilmer, H. A.: *This Is Your World: A Book for the Orientation of Professional Workers to the Emotional Problems of the Chronically Ill Patient: Tuberculosis and the Individual*. 1952.
 Young, F. (Editor): *Trial of The Seddons*. Second edition. 1952.

Association Notices

NORTHERN RHODESIA BRANCH

Notice is hereby given by the Council to all concerned that the existing Northern Rhodesia Branch, which has no Divisions, has been reconstituted as from the date of this notice into a Branch with two Divisions with the following titles and areas:

- (a) Northern Division, comprising the Western Province with districts of Kawambwa and Fort Rosebery.
 (b) Southern Division, comprising the Northern Province (excluding the districts of Kawambwa and Fort Rosebery) and the Eastern, Central, Southern and Barotsse Provinces.

A. MACRAE,
Secretary.

Diary of Central Meetings

DECEMBER

31 Thurs. Guildford Steering Committee, 10.30 a.m.

JANUARY

- 5 Tues. War Memorial Committee, 12 noon.
 7 Thurs. Rural Practices Committee, G.M.S. Committee, 2 p.m.
 7 Thurs. Central Consultants and Specialists Committee Executive, 2.30 p.m.
 8 Fri. Industrial Injuries Evidence Subcommittee, Occupational Health Committee, 2 p.m.
 12 Tues. Central Ethical Committee, 12 noon.
 12 Tues. Amending Acts Committee, 2 p.m.
 13 Wed. Council, 10 a.m.
 14 Thurs. Central Consultants and Specialists Organization Subcommittee, 10 a.m.
 14 Thurs. Staff Side, Committee "C," Medical Whitley Council (at 14, Russell Square, London, W.C.), 2 p.m.
 14 Thurs. Complaints Procedure Subcommittee, Central Consultants and Specialists Committee, 2.30 p.m.
 14 Thurs. Full Committee "C," Medical Whitley Council (at 14, Russell Square, London, W.C.), 3 p.m.
 15 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.

Correction.—The year mentioned in connexion with Dr. S. Q. Servanté (*Supplement*, December 12, p. 225) should have been 1950 and not 1940.